# REGIONAL FISHERIES LIVELIHOODS PROGRAMME FOR SOUTH AND SOUTHEAST ASIA: PHILIPPINES

GCP/RAS/239/SPA: RFLP Philippines Baseline Study

# Baseline Study for Dipolog, Katipunan, Manukan and Roxas, Zamboanga del Norte, Philippines

## Final Report

**Prepared by**

**JOSE RIZAL MEMORIAL STATE UNIVERSITY**
**Research Unit**

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# Baseline Study for Dipolog, Katipunan, Manukan and Sibutad, Zamboanga del Norte

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- the Local Government Units (LGUs), City/Municipal Agriculture (MAO) and City/Municipal Planning and Development (MPDO) Offices of Dipolog, Katipunan, Manukan and Roxas;

- the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR); and

- the fishing communities of the aforementioned city and municipalities.

Finally, this study could not have been realized without the generosity of the Government of Spain and the Food and Agriculture Organization (FAO).

# EXECUTIVE SUMMARY

The primary goal of Regional Fisheries Livelihoods Programme (RFLP) is to improve the livelihoods of small-scale fishers in the program area through targeted interventions that will produce grass root effects of improved fisheries management and livelihood development. The ultimate aim is to have community organizations and government institutions at different levels supporting efforts for fisheries co-management, livelihood development, improved quality and reduction of vulnerability in small-scale fishing communities. Realizing this noble goal of RFLP requires data for designing and implementing intervention programs.

The baseline study covers the coastal communities of Dipolog City and the municipalities of Katipunan, Manukan and Roxas in the province of Zamboanga del Norte which is the largest province of Zamboanga Peninsula in terms of land area. The coastal communities surveyed are situated along Dipolog Bay. The bay is a major resource base of fishing households in these communities but the quality and quantity of fisheries here had been exposed to pressures brought about by the demand of growing population and destructive human activities. Thus, addressing these problems is urgently needed with the involvement of various stakeholders to curb the further depletion of fisheries in this particular bay like elsewhere in Zamboanga del Norte.

The succeeding sections are the highlights of the baseline study given the available data that address the information needed as stated in the Terms of Reference of the project.

## On Co-management Concept

***Current understanding and expectations of the concept "co-management"***

Generally speaking, the majority of the respondents in all sites perceived that government agencies have the major responsibility in undertaking most of the functions in fisheries management including formulation of policies, enforcement of laws and regulations, study of the conditions and problems of fishery resources monitoring and assessment of fishery resources, and dissemination of information about these matters. This disposition is true for all sites except that monitoring and assessing the status of fishery resources is observed by the respondents from Manukan and Roxas as a shared responsibility of the government and fishing households and organizations. Specific data will further show that co-management is evident in Dipolog (66.67%) and Manukan (37.74%) which considered that planning for the management of fishery resources was a joint task of all local stakeholders: government, fishers and women.

***Examples of existing policies and institutions that support or inhibit co-management and identification of areas for strengthening***

Aside from the national laws such the Local Government Code of 1991 (Republic Act 7160) and the Philippine Fisheries Code of 1998 (Republic Act 8550) that devolve some government functions to the local government units and provide the necessary legal mechanisms such as the management and regulation of coastal and marine resources, there are likewise corresponding ordinances passed by the local legislative bodies in the study sites

to realize or implement such environmental mandates. These come in the forms of fishery ordinances that not only state the rules and regulations on fishing and the management of fisheries within the municipal waters, they also provide the ways by which the fishery and other sectors in the community can be involved and specifically the various fishers' associations in coastal barangays within Dipolog Bay.

***The attitudes and perceptions of fishers to formal and traditional management systems and conflict resolution system***

The prevailing preference among 49% of the fishing households surveyed is that conflict around fishery resources should be resolved amicably in the community by local leaders only, while about 22% said that this should be brought to court and resolved according to the provision of the law. Interestingly, about 29% believed that conflict will just die out as time passes by without settling them either through the formal or traditional management systems or conflict resolution system.

***Stakeholder practices in current management systems and recommendations for improvements***

Thirty-seven percent of the respondents observed that the local government units have strongly enforced the regulations pertaining to the protection and conservation of fishery resources together with the active participation of fishers either as individuals or associations. Those who said that only the government is strong in enforcement is also significant (30.94%), while only a few (13.59%) lamented that there are no existing regulations being implemented. The percentage of those who said that only the fishers are enforcing some regulations but without the support of the local government (18.11%) is quite higher. As a whole, co-management system enforcement is not working well and much has to be done in order so that the local government units, the fishing sector and other stakeholders can work together.

***Current systems for conflict resolution***

Almost 59% of the respondents said that the parties who are aggrieved over the utilization of certain fishery resources usually seek the intervention of local leaders. Although this validated the earlier sentiments that conflicts should be resolved within the local level, the percentage of those who said that nothing is done to resolve the conflict is not negligible (29.81%). Only 11% said that aggrieved parties usually go to court and file cases to resolve the source of conflict.

***Gender roles and responsibilities***

Generally, only 36% of all the respondents observed that the following community activities such as political meetings, school meetings, church meetings, cooperative work with manual labor, preparing food for group work, and protecting and conserving the environment are shared responsibilities. But manual labor and political meetings are the domains of men according to 71% and 35% of the respondents, respectively. In contrast, school meetings and food preparation are the tasks handled by women according to 49% and 43% of the respondents, respectively. 44.15% of the respondents noted that protecting and conserving the environment is shared in the community by men and women.

***Current types of stakeholder involvement in fisheries management***

The immediate stakeholders of resources within Dipolog Bay are the fishing households because their main livelihood depends upon the quality and amount of aquatic resources within this bay. Some are members of fishers associations that are involved in the management of coastal resources within their respective areas. From the government, the stakeholders are the Department of Agriculture through the Bureau of Fisheries and Aquatic Resources, the Department of Environment and Natural Resources, and the Department of Interior and Local Government.

***Perceptions of fishers and resource managers relating to the state of fisheries resources and allocation of benefits from fisheries***

Fifty-eight percent of the respondents perceived the fishery resources within Dipolog Bay have deteriorated mainly because of intensive and destructive fishing methods and other human activities in surrounding areas that have polluted and silted the bay causing damage to the mangroves, seagrass beds and coral reefs. Although commercial fishers are strongly restricted within the municipal waters they still pose threats and compete with the poor municipal fishers. Nevertheless, only 21% of the respondents complained of being deprived of their rightful access to municipal fishery resources because of the encroachment of commercial fishers.

## Safety at Sea and Vulnerability Reduction

***Current legal frameworks and guidance for safety at sea measures***

Unfortunately, there were no data provided for this section but it is presumed that there are local legal mechanisms which serve as the basis for enforcement of safety measures and the implementation of programs to secure the lives of fishing households and other sectors that depend upon the sea for their livelihood. Every local government is mandated by the Department of Interior and Local Government to formulate plans and policies for reducing risk and disasters of their constituencies.

***Current levels of awareness of fishers, their household members regarding safety at sea measures***

Ninety-two percent of all the respondents are aware of the importance of checking weather reports before every fishing trip, while about 88% take a radio or other communication equipment on every fishing trip. The first is a pre-emptive measure and guides the decision whether or not to go fishing when the weather is bad and when there is an advisory for small boats not to go out to the sea. Meanwhile, the second is preparatory for whatever eventualities to happen, like during bad weather, so that assistance can be called at any time.

***Perceptions of fishers and community members about incidences of accidents in targeted communities***

A significant proportion of respondents (46.04%) considered that there had been fewer incidences of sea accidents during the past 12 months compared to five years ago, while 29% said that there was no chane and it could either be higher or lower. Nevertheless,

this suggests the growing awareness among fishing households to be conscious and prepared of whatever possible accidents may happen when when fishing at sea.

***Current disaster preparedness systems in use and the facilities in place to utilize***

The primary preparation of 51% of households against disaster during calamities is moving to elevated areas specifically at times when typhoon occurs and flooding is a possible consequence. The storing of enough food is second on their list (43.40%) particularly that when going out to fish during typhoons is impossible.

***The level of confidence of fishers to avoid accidents and if necessary to recover from them***

The modal levels of confidence of all the respondents for their households and communities to avoid accidents at sea are equally up to 80% of the time. They felt that if their communities can avoid accidents that will also mean that their households can experience the same and they are highly confident about that possibility. But they are divided on their perceptions or they are not very sure about their households being able to recover from accidents, if such become inevitable, similar to their communities. Their confidence level for the recovery of their household is up to 60% only while it is up to 80% for their communities.

***State of communication and early warning systems in the project site***

Cell phone messages are considered by 75% of the respondents from Cluster 2 to have the ability to warn them about disasters up to 80% of the time. Although radio and televisions are also rated to have the same ability, only 69% and 61%, respectively, gave this rating which put the cell phone the most able warning devise. The ability of village courier to warn them is rated by 50% of the respondents to be only up to 60% of the time. In contrast, the ability of siren, bell, megaphones and public audio system to alert the community about forthcoming disaster is rated only up to 20% by 73% of the respondents. Generally, personally owned communication systems are considered more able to send warnings as compared to those operated by the community.

## Post-Harvest and Marketing

***Current levels of post-harvest skills, knowledge and practices***

Generally, the post-harvest practices that majority of the households of the respondents are engaged with are those that do not require too much technical skills and resources including sun drying (81.13%), salting (88.68%), chilling (78.11%) and freezing (59.25%). The Dipolog respondents are comparatively the most skilful particularly in canning, brining and freezing. As a whole, up to 60% of the needed knowledge and skills for doing certain tasks is the modal level of knowledge and skills of all households engaged in post harvest activities.

***Degree of perceived influence on the market by fishers and fish processers***

About 84% of all the respondents agreed that the local fishers had exerted some influence in the market in terms of the supply (77.36%), price (14.34%) and quality (8.30%) of fish they are able to sell. This also holds true with fish processors, but whose influence is lessened by how the fishers behave as they are the source of the raw materials for processing.

### *Participation of women and children in fish product processing and marketing*

Based on the percentage distribution of respondents who reported the involvement of fathers, mothers, sons and daughters in particular post-harvesting activities, it is noted that on the average, 21% reported that women or wives as compared to 15% of men or husbands are involved. This shows the major role of women in post-fishing activities. Correspondingly, more reported that daughters (8.00%) compared to the sons (5.00%) are also engaged in those tasks done by their mothers. Gender role issues are present both in terms of the types of activities performed which were appropriate to the expected gender roles and the relationships between members of the family. Mothers and daughters tend to work together, while fathers prefer to work with their sons.

### *Level of awareness and knowledge in safe, sanitary and healthy ways of food processing and preservation*

On average, only 29% of all the respondents said they are aware about the list of safe, sanitary and healthy ways of food processing and preservation presented to them during the survey. Their responses are skewed because all are aware of not exposing the landed fish to the sun and have this iced and of rejecting fish of unacceptable quality based on appearance and odour. Less that 50% of the respondents are aware of the remaining 13 sets of safety, sanitary and healthy measures presented to them.

## Livelihoods Enhancement and Diversification

### *Perceptions of prosperity*

There are no data available about the perceptions of prosperity of the respondents. Nevertheless, their responses on livelihoods availability provide a hint that they find their present economic condition difficult, and see little possibility of their main livelihood fishing improving in the future.

### *Attitudes toward changing or diversifying livelihoods*

Fifty-two percent of all the respondents do not favour changing their current livelihood(s), However there was considerable variation within the bay, with 100% against livelihood(s) change in Roxas (which greatly influenced the general trend of the data). On the contrary, the majority of respondents from Manukan (71.70%), Katipunan (68.00%) and Dipolog (52.94%) favoured looking for better or additional livelihoods opportunities.

## Micro-finance Services

### *Levels of awareness of accessing financial services*

If awareness of accessing financial services is indicated by actual use of such services, the data show that 56% of the households of all the respondents are aware of various lending agencies or individuals which they also patronized, while almost 44% are aware of rural banks. Specifically, the Center for Agriculture and Rural Development (CARD) is known to 18% of the respondents as compared to other lending agencies owned by private individuals.

***Levels of satisfaction of the different formal financial institutions***

Seventy-five percent of the households of all the respondents have not accessed any financial services from formal institutions, while only about 25% took the opportunity which they used to engage in productive projects. Respondent households have only used the formal financial services of rural banks and lending agencies. Fifty-six percent said that they are generally "satisfied" with their services or operational features in terms of repayment procedures (e.g., schedule and mode), proximity (i.e. location), interest rates (i.e. if high or enough) and dealing with clients (i.e. whether the service was friendly or not).

***Levels of satisfaction of the different informal financial institutions***

Respondents reported taking informal financing services from individuals rather than agencies or organizations, namely from money lenders, middle buyers, relatives and friends. Unlike the formal financial institutions the informal financial institutions offer only loan services and not savings like the rural banks. Although they have variable ratings, 55% of all the respondents said that they are "satisfied" with the informal financial institutions. The satisfaction ratings given are similar to all the operational features of the informal financing sectors such as loan requirements (e.g. collateral or referral), repayment procedures, proximity, interest rates and dealing with clients.

***Comparative access of women to financial services***

Forty-five percent of the transactions for accessing financial services reported by the respondents were done by both the husband and wife. Those transactions done by wife only are higher (43.66%) compared to those done by the husband (11.27%). But this does not automatically mean that the wives can decide for themselves about money matters. Time availability and the social characters of husbands and wives with regards to borrowing money are factors to consider in understanding the said differential access. The prevailing practice of having both husband and wife accessing financial services suggests the consultative manner the households manage their financial needs and resources.

***Existence of information and education mechanisms on lending***

Fifty-eight percent of the respondents admitted that they had attended training related to lending and this implies the existence of information and education mechanisms to ensure the ability of borrowers to comply with their loan obligations.

***Suggestions to improve lending relationships and savings***

Sixty-nine percent of all the respondents suggested that good ability to pay loans taken is one of the main ingredient in improving lending relationships and savings of households. This suggestion is intended for the borrower and not for the lender, 17% of the respondents suggested that the latter should offer low interest rate to keep their clients. They added that they should be more considerate to their clients (13.21%).

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BA | Basal Area |
| BFAD | Bureau of Food and Drugs |
| BFAR | Bureau of Fisheries and Aquatic Resources |
| CARD | Center for Agriculture and Rural Development |
| CBH | Circumference at Breast Height |
| CENRO | Community Environment and Natural Resources Office |
| CPUE | Catch Per Unit Effort |
| DA | Department of Agriculture |
| DBH | Diameter at Breast Height |
| DENR | Department of Environment and Natural Resources |
| DILG | Department of Interior and Local Government |
| FAO | Food and Agriculture Organization |
| FARMC | Fisheries and Aquatic Management Council |
| HACCP | Hazard Analysis and Critical Control Points |
| IEC | Information, Education, Communication |
| JRMSU | Jose Rizal Memorial State University |
| LGU | Local Government Unit |
| LI | Line Intercept |
| MAO | Municipal Agriculture Office |
| MPAs | Marine Protected Areas |
| MPDO | Municipal Planning and Development Office |
| MO | Municipal Ordinance |
| PCRA | Participatory Coastal Resources Assessment |
| PENRO | Provincial Environment and Natural Resources Office |
| RFLP | Regional Fisheries Livelihood Programme |
| RA | Republic Act |
| RG | Random Quadrat |
| TOR | Terms of Reference |
| TQ | Transect-Quadrat |
| ZDN | Zamboanga del Norte |

# Chapter I

# INTRODUCTION

Strengthening broad interest in and support to fisheries management and sustainable livelihoods enhancement is needed so that severe poverty can be reduced and degradation of coastal and marine ecosystems can be minimized. Poverty and degradation of these ecosystems have greatly affected fishing households and communities as well as the entire coastal populations and their economies. This is the broader context for doing this baseline study.

## The Regional Fisheries Livelihoods Programme

The Food and Agriculture Organization (FAO) of the United Nations with funds from the Kingdom of Spain developed the Regional Fisheries Livelihoods Programme (RFLP) of which the present study will serve as the baseline for its intervention projects in this part of the globe. The expected outcome of RFLP is the strengthened capacity among participating small-scale fishing communities and their supporting institutions towards improved livelihoods and sustainable fisheries resources through co-management mechanisms. The impact of the program will be measured as to the extent various community organizations and government institutions at different levels support fisheries co-management, improve livelihoods and reduce the vulnerability of small-scale fishing communities in the participating countries.

Aside from the Philippines, the RFLP is currently being implemented in five other South and Southeast Asian countries which include Cambodia, Indonesia, Sri Lanka, Timor-Leste and Viet Nam. The activities of RFLP in the Philippines are implemented by the Bureau of Fisheries and Aquatic Resources (BFAR) in the province of Zamboanga del Norte. Meanwhile, the Jose Rizal Memorial State University (JRMSU) was contracted by FAO-RFLP to conduct a baseline study in the 12 coastal cities and municipalities of the province. It will be against the baseline by which the progress of RFLP will be monitored and evaluated according to the following output indicators:

1. Co-management mechanisms for sustainable utilization of fishery resources;
2. Improved safety and reduced vulnerability for fisher communities;
3. Improved quality of fishery products and market chains;
4. Strengthened and diversified income opportunities for fisher families; and
5. Enhanced access to micro-finance serviced for fishers, processors and vendors.

## The Baseline Study Project

***Research objectives.*** The primary goal of RFLP is to improve the livelihoods of small-scale fishers in the program area through targeted interventions to develop the fisheries sector. It will produce grass root effects of improved fisheries management and livelihoods

development through concrete interventions in selected target communities and coastal areas. The end-of-project situation will show community organizations and government institutions at different levels in a better position to support fisheries co-management, livelihoods development, improved quality and reduction of vulnerability in small-scale fishing communities. More specifically this baseline study sought to attain the following objectives:

1. To document socioeconomic, cultural, and political conditions in each participating municipality;

2. To undertake fisheries and coastal resources profiling and benchmarking through employing standard methodologies in resource assessments in order to establish an accurate baseline database, and to identify issues and problems, threats and opportunities relevant to resource use practices and sustainability of the resource base;

3. To create a database of secondary and primary data which can be used to determine appropriate indicators in monitoring and evaluating the outcomes of the program; and,

4. To undertake photo and video streaming documentation of the survey activity and in support of baseline results according to the mentioned outputs.

***Research sites and participants.*** The study covers two cities and 10 municipalities in the Province of Zamboanga del Norte which is the largest province of the Zamboanga Peninsula in terms of land area. These areas include the cities of Dapitan and Dipolog and the municipalities of Rizal, Sibutad, Jose Dalman, Leon Postigo (formerly Bacungan), Liloy, Salug, Sindangan, Katipunan, Manukan and Roxas (see Figure 1).

The respondents or participants of the baseline study were the adult members, either husbands or wives, of coastal households engaged in fishing, processing and trading of fish products; the officials of people's organizations, non-government organizations, local government units and government agencies responsible for the implementation of projects as well as the administration, management and development of the coastal fisheries. The total sample of households included in the survey was 902 distributed as follows: Cluster 1 (230 or 25.50%), Cluster 2 (265 or 29.38%) and Cluster 3 (407 or 45.12%). The actual sample size per cluster, which was arbitrarily determined by quota sampling, was on average about 6% of the household population per site (see Table 1).

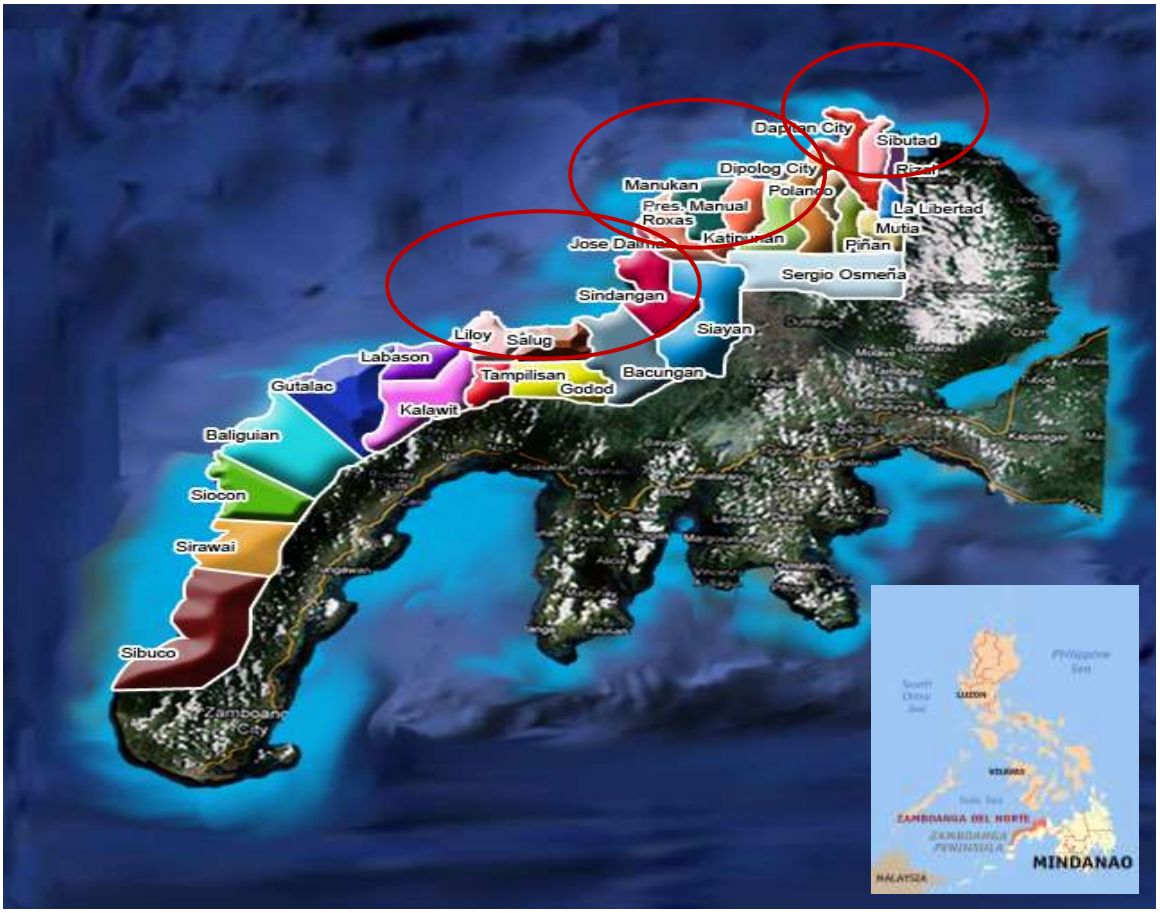


**Figure 1**. Map of Zamboanga del Norte, Philippines
Sources: http://zamboangadelnorte.com/maps and Google Map 2012.

**Table 1**. Sample Size in Relation to Household Population

| Cities/Municipalities | Household Population (2007) | Actual Sample Size | Percent of Households |
|---|---|---|---|
| Cluster 1 | | | |
| Dapitan City | 1,710 | 100 | 5.85 |
| Rizal | 756 | 47 | 6.22 |
| Sibutad | 1,404 | 83 | 5.91 |
| Sub-total | | 230 | |
| Cluster 2 | | | |
| Dipolog City | 1,746 | 102 | 5.84 |
| Katipunan | 810 | 50 | 6.17 |
| Manukan | 864 | 53 | 6.13 |
| Roxas | 990 | 60 | 6.06 |
| Sub- total | | 265 | |
| Cluster 3 | | | |
| Jose Dalman | 810 | 50 | 6.17 |
| Leon Postigo | 630 | 40 | 6.34 |
| Liloy | 1,728 | 101 | 5.84 |
| Salug | 1,062 | 60 | 5.65 |
| Sindangan | 2,718 | 156 | 5.74 |
| Sub-total | | 407 | |
| Grand Total | 15,228 | 906 | 5.95 |

***Research instruments and procedures.*** A reconnaissance survey was first conducted in the pre-selected coastal barangays in each of the two cities and ten municipalities covered

by the study. This enabled the team to have an overview of the general condition of the coastal areas and to gather some preliminary data, as well as to validate some secondary data. In addition, rapport was established with some local government officials and key community members.

The multiple data collection methods used in the study allows an in-depth and objective description of the current situation which O'Donoghue and Punch (2003) contend to allow the "cross-checking of data from multiple sources to search for regularities in the research data". The faculty members of JRMSU who were divided into the social science and bio-physical science teams and distributed throughout the three clusters of communities covered by the study were basically responsible for gathering and processing of data.

The methods used by the social science team involved analysis of secondary data, key informant interview, focus group discussion and household surveys. The key informant interview and focus group discussion were conducted using guide questions while the household survey was done through a semi-structured interview questionnaire. The questionnaire has several parts corresponding to the needed household data which included socio-economic and demographic information, perceptions on the quality of fishery resources, concepts and understanding of co-management, gender roles and involvement in fisheries production and management, fisheries post-harvesting activities and marketing, attitudes toward livelihoods changes, sea safety and avoidance of and recovery from accidents and other related questions.

The assessment of the mangrove ecosystem involved locating the mangrove forest based on published records, actual interviews and inspection of the sites. The number of stations was established per site depending on zonation patterns and extent of the forest cover. Photographs were taken to help in the easy location of the site.

The structure of the mangrove community was determined using the transect plot technique (English, Wilkinson & Baker, 1997). Plots (10 m x 10 m) were randomly established in each forest type or zone. The mature mangroves (DBH > 4 cm) found in each plot were counted and measured for diameter at breast height. If the density of saplings (<4 cm DBH and height > 1 m) is very high and uniform, a 5 x 5 m plot was established inside the 10 m x 10 m plot and the saplings actually counted. If the density of seedlings (height < 1 m) is very high and uniform, a 1 m x 1 m subplot was established for actual counts. Only dominant mangrove species were quantified.

Diversity, density and basal area were computed using the following definitions and formula (Dejarme, 2006):

*Diversity* – the number of species encountered per transect

*Stem density* – the number of trees per plot

$$\textit{Stand density per hectare} = \frac{\text{No. of stems in plot X 10,000}}{\text{Area of plot}}$$

$$\textit{Basal Area}\ (\text{BA}) = \frac{\pi\ (\text{diameter at breast height})^2}{4}$$

Where: unit = $cm^2$ $\pi = 3.141$

Since the data obtained were circumference at breast height (CBH), these were converted to diameter at breast height (DBH):

$$\textit{Diameter at breast height}\ (\text{DBH}) = \frac{\text{CBH}}{\pi}$$

$$\textit{Stand BA} = \frac{\text{Sum of BA for all species unit} = m^2 \text{ per hectare}}{\text{Area of plot}}$$

Because several plots were established, the average values for these plots were computed.

The transect quadrat method (TQ method) was used in the study of seagrass. Two 50-meter transects were laid in every station. For every transect laid, seagrass cover per species at every five meter interval was recorded using a 0.5 x 0.5 m quadrat. Percentage cover of the substrate and vegetation were calculated using the following formula:

$$\%\ cover = \frac{Number of subquadrats occupied}{25} \times 100$$

For the study of coral reefs, stations were initially identified before actual surveys were conducted. These stations were marine protected areas (MPAs). In each station, 10 permanent quadrats were marked by two iron bars half driven into the substratum and position diagonally on two corners of the quadrat. These quadrats were monitored over time.

Line-intercept method was used to obtain benthic cover data (English *et al.*, 1997). Three 20 m transects were laid parallel to the shore in shallow (3 m deep) and deep (10 m deep) coral stations. The same transect line for fish survey was used. The length of each benthic category bisecting the transect was recorded to obtain its per cent cover and to determine the reef condition using the four categories of hard coral cover by Gomez (1991): 0 - 24.9% = Poor, 25 - 49.9% = Fair, 50 – 74.9 = Good, 75 – 100 = Excellent.

Quantitative estimates of coral reef fishes were made using a modified visual census technique described in English *et al.* (1997). An individual census area was demarcated by laying out a 50 meter transect tape parallel to the shore. Visual census was carried out by a single observer at each station swimming along the length of the transect. All fish encountered within 5 meters of the slope-side or within 5 meters of both sides of the line were identified, counted, and their sizes (fork lengths) were estimated to the nearest centimetre.

Target or commercially important species included Acanthuridae, Caesionidae, Carangidae, Scaridae, Serranidae, Mullidae, Haemulidae, Belonidae, Nemipteridae, Lutjanidae and Lethrinidae. Fish biomass (kg/500 $m^2$) was derived using size estimates from surveys and length-weight conversions (of the form $W = aLb$). The species-specific parameters $a$ and $b$ of such conversions are available at FishBase.org (Froese & Pauly, 2000).

Freshwater tributaries such as rivers and sedimentation rates were also noted. Three sets of sediment traps (3 per set) were deployed at the river mouths and were retrieved after

24 hours. Traps were brought to the laboratory and the sediments were filtered off from the water contained in the tube using pre-weighed GFC filters. Samples were dried overnight in an oven at 60 °C and were weighed to the nearest milligram.

The biophysical research team also went to fish landing sites for fish catch monitoring and recorded information on fish species, weight, size and other information such as total number of boats operating on the day, seasonality of fish abundance, seasonality of gears and juveniles using the questionnaire. Changes in the resource status with time were also assessed.

Finally, the collection of primary and secondary data from different sources by both the social science and biophysical research teams were processed and analyzed using descriptive statistics such as frequency and percentage distributions and measures of central tendency particularly mode and mean.

**Scope of Work and Flow of Activities**

To accomplish the baseline study project, the JRMSU Research Team with assistance from the Bureau of Fisheries and Aquatic Resources (BFAR) undertook the activities reflected in Figure 2. The JRMSU Research Core Group met at ZSRTC Office, JRMSU–Main Campus on July 26-27, 2010 for the preparation and submission of the RFLP proposal to the RFLP-Philippines consultants. Ms. Jessica Muños, the National Project Director, attended the meeting. During a writeshop the research team designed the methodology of the study and formulated the household survey instruments and the approach to use in the collection of primary and secondary data using the Terms of Reference (TOR) as a guide.

On September 15, another writeshop was conducted to incorporate the comments and suggestions made by the consultants in the project proposal. Such activity also oriented the team on the kind of data to be gathered in the identified communities to be covered in the province. After the preparation and finalization of the RFLP proposal, the project manager and technical director recruited and conducted final briefing of researchers and enumerators for primary and secondary data collection. Team meetings were also carried out to familiarize the members with the study sites and to enable them to expand their knowledge on the methods to be employed. A day later, a conference with RFLP foreign dignitaries, RFLP-Philippine representatives and the university research team was held at the ZSRTC Office. Thereafter, the pilot testing of the baseline household survey instrument was done and this was accordingly revised and modified.

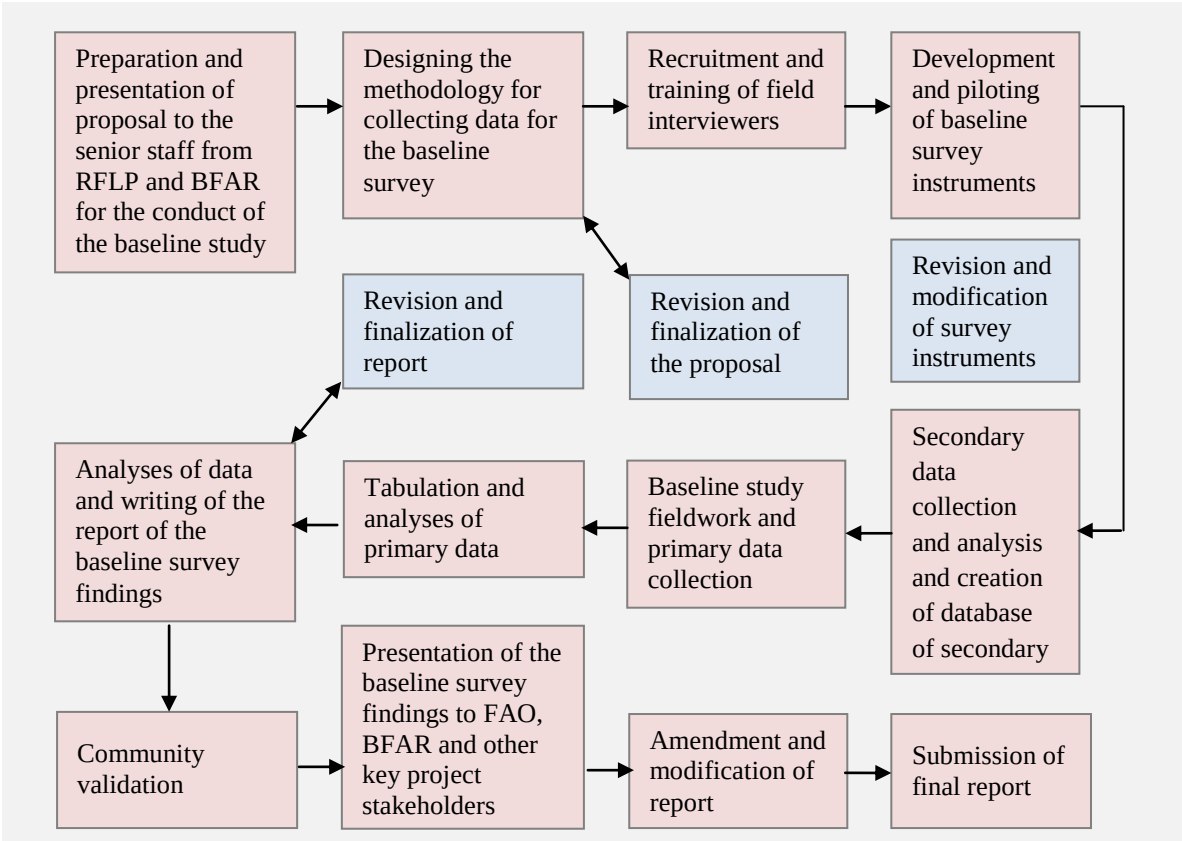


**Figure 2**. Flow of the RFLP Study Project

The team gathered secondary data from various offices in the province such as the Municipal Agriculture Office (MAO), Municipal Planning and Development Office (MPDO) and other municipal government offices as well as school libraries. The secondary data gathered were consolidated, tabulated and analyzed. On October 21, 2010, the researchers and enumerators went again to the municipalities to gather secondary data to fill in the gaps. A database was created to store the secondary data collected by the project.

On November 10, 2010 until the first week of December 2010, the assessment of fish catch, distribution of catch monitoring form and reconnaissance of mangroves, sea grass and marine protected areas in the three clusters were undertaken by the biophysical research team. On December 18-22, the coastal habitats of Cluster 1 and 2 were assessed and questionnaires for collected primary data were given to the respondents. The assessment of habitats and distribution of questionnaires in Cluster 1 took place on December 27–30, 2010. The focus group discussions and the interviews of key informants were conducted at the study sites on January 8–9, 2011 and on January 11–14, 2011. The primary data collected were eventually tabulated and analyzed.

The consolidation of the primary and secondary data as well as the writing of the research report took place on January 20–22, 2011 at the Bajamunde's Farm and Pension House in Dapitan City. The research results were presented to the local government officials for validation and to the UN-FAO RFLP Philippine consultants for correction, comments and recommendations for its improvement. The report was amended and modified into the draft of the final report of the survey which incorporated the suggestions made by the RFLP-Philippine consultants.

## Organization of the Report

The baseline study report presents the situation of every research or project site but classified into three clusters which was mentioned earlier based on geographic proximity. Considering the bulk of data to be analyzed and presented as well as the variations of the sites surveyed, the report is divided into three volumes. This format is more convenient to read than to have all the sites presented in one large volume.

The first volume contains the baseline study for Cluster 1 which includes Dapitan City, Rizal and Sibutad, while the second volume is the report for Dipolog City, Katipunan, Manukan and Roxas, and the third volume for Jose Dalman, Leon Postigo, Liloy, Salug and Sindangan.

Each of the reports has the same sections or chapters but the specific contents vary depending on the available data gathered and the situations being described. However, Chapter I which is the Introduction is the same in all the three volumes because it contains the background and the field methods used in the study which apply to all the project sites.

# Chapter II

# GEOPOLITICAL AND SOCIO-ECONOMIC STATUS

Engagement in natural resources management is no longer only a technical matter or a concern of the bio-physical sciences. It is also a social issue that demands an understanding of the geographical and political divides that govern the utilization of natural resources. Thus, basic to the investigation of the status of coastal and fishery resources in Dipolog Bay is the analysis of the distribution and characteristics of human communities and population along or within this area.

## Geopolitical Boundaries

Dipolog Bay is bounded by 35 coastal barangays along its eastern and southern shorelines stretching throughout the coastal areas of Dipolog City and three adjacent municipalities that include Katipunan, Manukan and Roxas. The bay is geographically positioned, is known as the gateway of investors and tourists to north western Mindanao, and it has an extensive coastline. The soil adjacent to the bay is generally fertile and its water is abundant in marine resources.

***Dipolog City***. The city derived its name from the Subanen dialect *"di ... pag"* which means *"across the river"*. Through the years, this was corrupted by mispronunciation and intermingling of Visayan and Subano words into what it is today "Dipolog". (http://www.dipologcity.org/city_profile.html**).** Dipolog is known for its wild orchids and its sardine industry which stems from the rich fishing area off its shores. Because of this industry it is has been labelled as the "Bottled Sardines Capital of the Philippines". It is called the "Gateway to Western Mindanao" through the Western Nautical Highway.

It has an area of 13,628 hectares and is situated in the north-western part of the province of Zamboanga del Norte and comprises 1.89% of the total area of the province which covers 720,594 hectares. To the north is Dapitan City, to the east is Polanco, to the south is Katipunan and to the west is the Sulu Sea. The city has a rolling terrain with lowlands along its western coast facing the Sulu Sea. It has a number of waterways that include rivers, small creeks and streams. Its climate is mild and moderate wherein rainfall is more or less evenly distributed throughout the year (http://www.dipologcity.org/city_profile.html).

Agriculture is the dominant land use of Dipolog, while about 200 hectares are devoted to industries. The area turned into commercial use covers about 255 hectares, while the residential area measures 1,920 hectares. Only about 166 hectares are devoted for institutional uses, while those spaces still open for development account for about 154 hectares. Parks and recreation centres cover an area of 56.63 hectares. While planned unit development has an area of 15 hectares, the city government has declared 240 hectares at Minaog and Dicayas as its watershed and eco-tourism site. Moreover, the city has a total of

676 hectare of forest area, which is about 4.76% of its total area (http://www.dipologcity.org/city_profile.html**).**

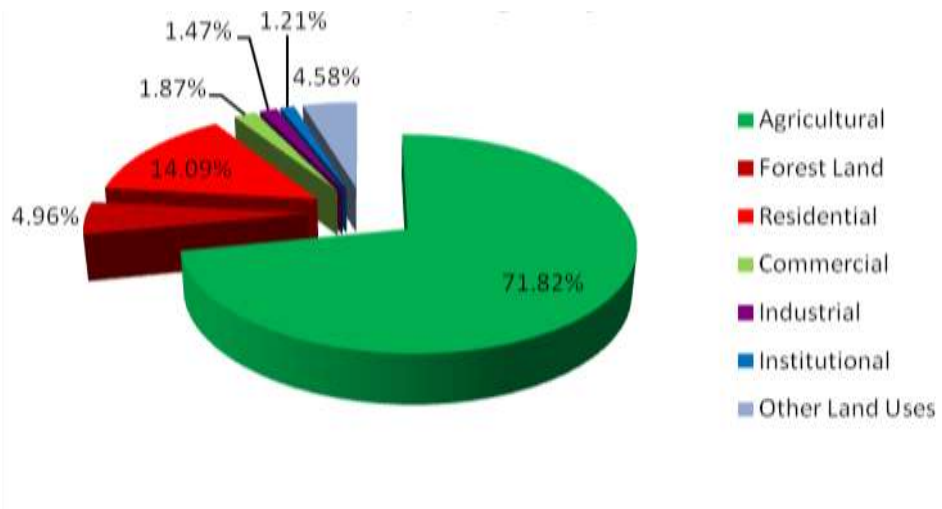


**Figure 3.** Land utilization in Dipolog City.

***Katipunan.*** The initial name of Katipunan is Lubungan which started as a "parochia" established by the Franciscans in the 1700's. By virtue of Executive Order No. 21, it became a constituted municipality in 1914 comprising the municipalities of Manukan, Ponot and Roxas which made it the biggest municipality of Zamboanga del Norte until 1950. Lubungan was changed to Katipunan from the word "Tipon" which signifies unity in 1936 by virtue of Commonwealth Act 3832 (Romarate 2007).

Katipunan is bounded by Roxas to its west, Sergio Osmeña to its south, Dipolog City on the east which is just 14 km. away and Sulu/Mindanao Sea to the north. It has a total land area of 24,412 hectares with a generally rugged terrain. The existing general land uses are classified into built-up areas (306 has.), agricultural areas (14,404.05 has.), forest areas (973 has.), and agro-industrial areas (2.36 has.) (http://www.katipunan.zamboangadelnorte.com.) Moreover, the municipality has a shoreline that stretches up to about 5 kilometres from its boundaries.

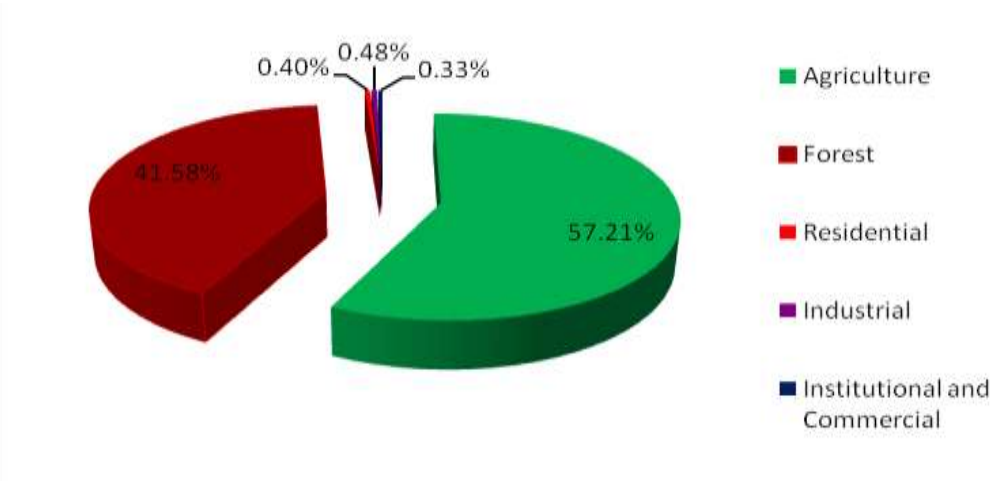


**Figure 4.** Land utilization in Katipunan.

***Manukan.*** This town which measures 25,291.57 hectares derived its name from the local word *manok* (chicken) and was once a barrio of Katipunan. It became a town in 1951 by virtue of the Executive Order signed by Pres. Elpidio Quirino. It is located on the southern part of Zamboanga del Norte and is approximately 38 kilometres away from Dipolog City

It is bounded by the Sulu Sea on the north side. On the east and southeast side is Roxas, while Jose Dalman lies to the west and southwest. The majority of the barangays are situated on rolling and hilly areas and are classified as generally craggy and rough with slopes from less than 10º to almost 70º, except those along the coast. It is traversed by rivers and creeks which overflow during the wet season. It has approximately 18 km of total shoreline. It enjoys a fairly warm temperature throughout the year with a mean annual temperature around 27.4ºC and a mean range of 14ºC. Due to a very short dry season, the relative humidity is comparatively high and uniform (http://www.manukan.zamboangadelnorte.com/).

***Roxas.*** This was formerly known as Langatian before it was raised to its status as a town on June 17, 1967 by virtue of R.A. 5077, after which it was separated from the Municipality of Katipunan. Its western fringe is Manukan, its eastern side is Katipunan, north of it is the Sulu Sea, while to the south is Sindangan and Siayan (http://www.roxas.zamboangadelnorte.com). The town has a gentle to moderate topography on its northern part fronting the coastal areas of the Sulu Sea, and has moderate to very steep slopes in its southern part, which is made up of hills and mountain ridges.

Two-thirds of the land area of Roxas is on hilly ground and only one-third on level ground. The total land area of 27,082.28 hectares is used for residential, agricultural, forestall and industrial purposes (Artajo, 1999). It is crisscrossed by four wide rivers which include Dohinob Daku, Dohinob Diut, Tangian and Piao and three creeks called Irasan Langatian and Minang. The areas located along the banks of the rivers are prone to flooding. These areas are located at Dohinob, Denoman, Marupay, Piñamar, Piñalan, Pangologon, Piao and Langatian.

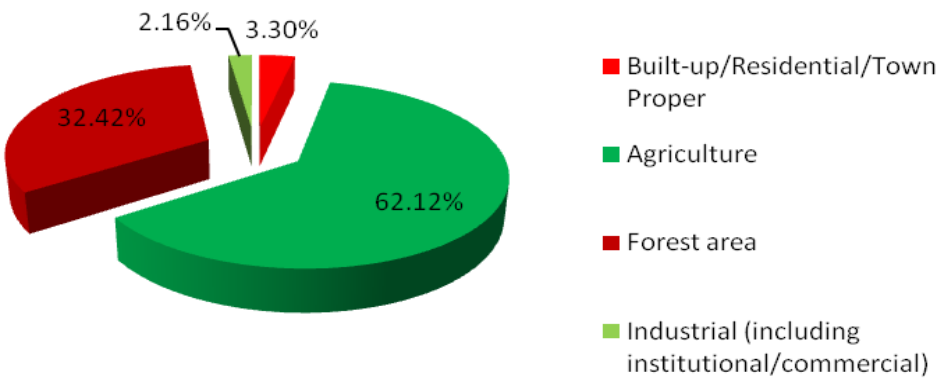


**Figure 5.** Land utilization in Roxas.

## Household Characteristics

***Household size.*** The modal size of households in all the communities surveyed is four but variations across sites is noticed. It is largest in Katipunan (6 at 32.00%) and smallest in Manukan (3 at 24.53%)) while Roxas (4 at 30.00%) and Dipolog (5 at 20.59%) have figures between the first two sites. Meanwhile, the largest household size with 10 members is reported in Dipolog.

**Table 2.** Household Size Distribution

| Household Size | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| 1 | 3 (2.94) | - | 4 (7.55) | 2 (3.33) | 9 (3.40) |
| 2 | 7 (6.86) | 3 (6.00) | 10 (18.87) | 7 (11.67) | 27 (10.19) |
| 3 | 18 (17.65) | 6 (12.00) | 13 (24.53) | 14 (23.33) | 51 (19.24) |
| 4 | 17 (16.67) | 11 (22.00) | 6 (11.32) | 18 (30.00) | 52 (19.62) |
| 5 | 21 (20.59) | 9 (18.00) | 7 (13.21) | 11 (18.33) | 48 (18.11) |
| 6 | 15 (14.71) | 16 (32.00) | 5 (9.43) | 3 (5.00) | 39 (14.72) |
| 7 | 13 (12.75) | 3 (6.00) | 5 (9.43) | 4 (6.67) | 25 (9.43) |
| 8 | 4 (3.92) | 2 (4.00) | 2 (3.77) | 1 (1.67) | 9 (3.40) |
| 9 | 2 (1.96) | - | 1 (1.89) | - | 3 (1.13) |
| 10 | 2 (1.96) | - | - | - | 2 (0.76) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (101.67) | 265 (100.00) |

***Household types.*** Majority of all the households surveyed has a nuclear type (92.08%) and this means they are only composed of the parents and their unmarried children. Only about 8% are extended households which are composed of members that also include unmarried children or grandparents and other relatives. Seemingly, households with lesser members are of nuclear type as shown in the case of households in Manukan. The households surveyed have modal size of three and the most with nuclear type households (98.11%).

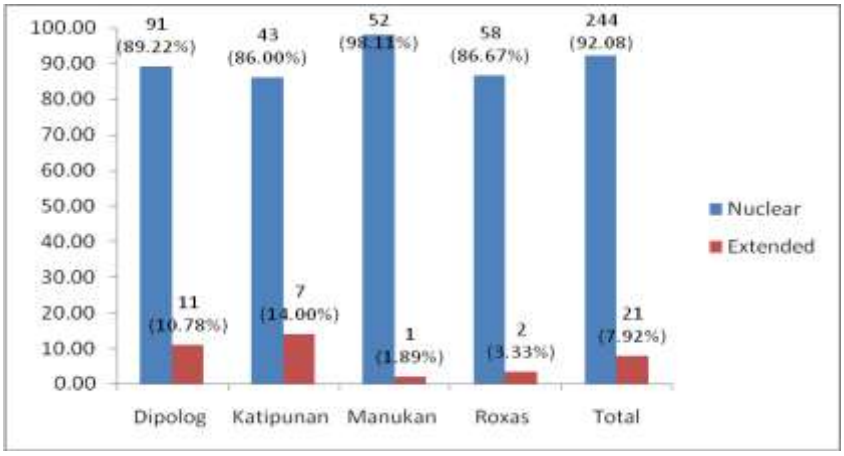


**Figure 6.** Percentage distribution of household types.

***Age-sex distribution.*** About 51% of the members of households surveyed have members that belong to age cohort from 0 to 19 years old, which suggests a young population and, therefore, more dependents to support in addition to the elderly. There are slightly more boys in the 0-19 age cohort than girls (50.26%).

**Table 3.** Age-Sex Distribution of Household Members

| Age Cohort | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
| 0-4 | 33 (10.12) | 13 (9.92) | 17 (13.18) | 20 (11.90) | 83 (11.01) | 54 (22.59) | 21 (19.81) | 27 (25.23) | 27 (21.26) | 129 (22.28) |
| 5-9 | 62 (19.02) | 26 (19.85) | 21 (16.28) | 36 (21.43) | 145 (19.23) | 22 (9.21) | 11 (10.38) | 8 (7.48) | 10 (7.87) | 51 (8.81) |
| 10-14 | 30 (9.20) | 13 (9.92) | 10 (7.75) | 16 (9.52) | 69 (9.15) | 33 (13.81) | 12 (11.32) | 14 (13.08) | 16 (12.60) | 75 (12.95) |
| 15-19 | 35 (10.74) | 16 (12.21) | 16 (12.40) | 21 (12.50) | 88 (11.67) | 12 (5.02) | 11 (10.38) | 4 (3.74) | 9 (7.09) | 36 (6.22) |
| 20-24 | 15 (4.60) | 6 (4.58) | 5 (3.88) | 6 (3.57) | 32 (4.24) | 10 (4.18) | 5 (4.72) | 4 (3.74) | 5 (3.94) | 24 (4.14) |
| 25-29 | 15 (4.60) | 8 (6.11) | 10 (7.75) | 8 (4.76) | 41 (5.44) | 20 (8.37) | 10 (9.43) | 13 (12.15) | 11 (8.66) | 54 (9.33) |
| 30-34 | 15 (4.60) | 11 (8.40) | 12 (9.30) | 14 (8.33) | 52 (6.90) | 22 (9.21) | 9 (8.49) | 10 (9.35) | 9 (7.09) | 50 (8.64) |
| 35-39 | 21 (6.44) | 9 (6.87) | 6 (4.65) | 12 (7.14) | 48 (6.37) | 15 (6.28) | 7 (6.60) | 6 (5.61) | 11 (8.66) | 39 (6.74) |
| 40-44 | 23 (7.06) | 10 (7.63) | 10 (7.75) | 11 (6.55) | 54 (7.16) | 12 (5.02) | 5 (4.72) | 2 (1.87) | 5 (3.94) | 24 (4.14) |
| 45-49 | 24 (7.36) | 5 (3.82) | 4 (3.10) | 5 (2.98) | 38 (5.04) | 3 (1.26) | 2 (1.89) | 1 (0.93) | 4 (3.15) | 10 (1.73) |
| 50-54 | 11 (3.37) | 6 (4.58) | 9 (6.98) | 6 (3.57) | 32 (4.24) | 17 (7.11) | 9 (8.49) | 12 (11.21) | 10 (7.87) | 48 (8.29) |
| 55-59 | 15 (4.60) | 3 (2.29) | 2 (1.55) | 6 (3.57) | 26 (3.45) | 6 (2.51) | 2 (1.89) | 2 (1.87) | 3 (2.36) | 13 (2.24) |
| 60-64 | 6 (1.84) | 4 (3.05) | 6 (4.65) | 5 (2.98) | 21 (2.78) | 6 (2.51) | 1 (0.94) | 3 (2.80) | 5 (3.94) | 15 (2.59) |
| 65-69 | 10 (3.07) | 1 (0.76) | 1 (0.78) | 2 (2.19) | 14 (1.86) | 5 (2.09) | - | 1 (0.93) | 2 (1.57) | 8 (1.38) |
| 70-74 | 3 (0.92) | - | - | - | 3 (0.40) | 2 (0.84) | - | - | - | 2 (0.35) |
| 75+ | 8 (2.45) | - | - | - | 8 (1.06) | - | 1 (0.94) | - | - | 1 (0.17) |
| Total | 326 (100.00) | 131 (100.00) | 129 (100.00) | 168 (100.00) | 754 (100.00) | 239 (100.00) | 106 (100.00) | 107 (100.00) | 127 (100.00) | 579 (100.00) |

Only Dipolog and Katipunan have household members, male and female respectively, that fall within the 75 years old and above age cohort. Meanwhile, the male household members belonging to 60 years old and above are greater (6%) than the female members (4) based on their proportion to the entire population of the households surveyed.

***Religious affiliation.*** Almost 92% of the households admitted to be members of the Roman Catholic Church which suggests the religious homogeneity of the communities surveyed. Other religious groups include Muslims and members of the Iglesia ni Cristo and the Seventh Day Adventist and others.

**Table 4.** Household Religious Affiliation

| Religion | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Roman Catholic | 88 (86.28) | 48 (96.00) | 50 (94.34) | 57 (95.00) | 243 (91.70) |
| Iglesia ni Cristo | 2 (1.96) | 1 (2.00) | - | - | 3 (1.13) |
| Islam | 3 (2.94) | - | - | - | 3 (1.13) |
| Seventh Day Adventist | - | - | 1 (1.89) | - | 1(0.38) |
| Others | 9 (8.82) | 1 (2.00) | 2 (3.77) | 3 (5.00) | 15 (5.66) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Dialect.*** The Cebuano-speaking groups constitute 97% of the households which is another indicator of the ethnic homogeneity of the communities surveyed. Only in Dipolog

were there Tagalog and Ilonggo speakers, while Katipunan has Tagalog speakers and Manukan has Tausog speakers.

**Table 5.** Dialects Spoken in the Household

| Dialect | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Cebuano | 98 (96.08) | 49 (98.00) | 51 (96.23) | 60 (100.00) | 258 (97.36) |
| Tagalog | 2 (1.96) | 1 (2.00) | - | - | 3 (1.13) |
| Tausog | - | - | 2 (3.77) | - | 2 (0.75) |
| Ilonggo | 1 (0.98) | - | - | - | 1 (0.38) |
| Others | 1 (0.98) | - | - | - | 1 (0.38) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Educational attainment.*** Since there are no data that indicate those of school age who had attended school, the actual distribution of household members according to educational levels is used in the analysis. Firstly, it is established that about 16% (n= 212) of all the household members are not of school age while 84% are of school age. Secondly, as a whole among those of school age (n= 1,333), almost 98% had actually attended school, while 2% did not enjoy the same opportunity or privilege. So what is also interesting to see is how those who had attended or are currently in school are distributed by sex and across sites.

The community with the highest percentage of male that had only attended but had not completed elementary school is Roxas (43.24%), while Dipolog (17.23%) and Katipunan (16.67%) have those who had completed elementary school, Dipolog (19.75) who had attended high school while Manukan (23.62%) has those who had completed high school. It is in Dipolog (8.40%) where those who had attended college is highest, but those who completed college is highest in Manukan (3.94%)

**Table 6.** Distribution of Educational Attainment of Household Members Who Attended School

| Sex and Communities | Attended Elementary (%) | Completed Elementary (%) | Attended High School (%) | Completed High School (%) | Attended College (%) | Completed College (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| Male | | | | | | | |
| Dipolog | 88 (36.97) | 41 (17.23) | 47 (19.75) | 40 (16.81) | 20 (8.40) | 2 (0.84) | 238 (100.00) |
| Katipunan | 46 (40.35) | 19 (16.67) | 21 (18.42) | 18 (15.79) | 9 (7.89) | 1 (0.88) | 114 (100.00) |
| Manukan | 45 (35.43) | 18 (14.17) | 21 (16.54) | 30 (23.62) | 8 (6.30) | 5 (3.94) | 127 (100.00) |
| Roxas | 64 (43.24) | 23 (15.54) | 26 (17.57) | 23 (15.54) | 11 (7.43) | 1 (0.68) | 148 (100.00) |
| Total | 243 (38.76) | 101 (16.11) | 115 (18.34) | 111 (17.70) | 48 (7.65) | 9 (1.44) | 627 (100.00) |
| Female | | | | | | | |
| Dipolog | 50 (25.64) | 44 (22.56) | 48 (24.62) | 22 (11.28) | 21 (10.77) | 10 (5.13) | 195 (100.00) |
| Katipunan | 25 (29.07) | 14 (16.28) | 24 (27.91) | 10 (11.63) | 9 (10.46) | 4 (4.65) | 86 (100.00) |
| Manukan | 35 (42.17) | 8 (9.64) | 23 (27.71) | 12 (14.46) | 2 (2.41) | 3 (3.61) | 83 (100.00) |
| Roxas | 34 (32.69) | 16 (15.39) | 33 (31.73) | 13 (12.50) | 6 (5.77) | 2 (1.92) | 104 (100.00) |
| Total | 144 (30.77) | 82 (17.52) | 128 (27.35) | 57 (12.18) | 38 (8.12) | 19 (4.06) | 468 (100.00) |

Among the female members of households, Manukan (42.17%) has the highest who had attended but not completed elementary school, but Dipolog (22.56%) has those who had completed elementary education. Manukan (14.46%) has the highest who had completed high school but it is Roxas (31.73%) that had those who had attended high school. Perhaps it is a city and tertiary schools are present, Dipolog has the highest who had attended college (10.77%) and those who had completed a degree (5.13%). But what is noticeable is the fact that those who entered and completed college greatly vary—less had actually earned a complete education. And this trend is noticed in all academic levels. What is also intriguing is

that while the number of girls completing high school (57) overall was less than half the number of boys (111) more girls completed college education, i.e. 19 girls compared to 9 boys.

***Employment and mean monthly income.*** Fishing and related enterprise are the primary livelihoods of all the households surveyed (83.02%) because they are situated in coastal communities and the target population for this study. It must be also a secondary income source to some households. Just like many rural communities, the wives have a very low participation in the productive labor. They do not report housekeeping or being in the house as work although they are may be actually involved in some pre- and post-fishing related activities for fishing households, except in fish trading which requires them to leave the home.

Other major occupations observed by only a few households are farming, carpentry and employment in government and private agencies. The meagre income of some households can be partly attributed to the limited involvement of the wives in productive role and their focus on reproductive tasks. This condition is one potential area to consider in developing alternative livelihood options in these communities, but requires careful study of how much free time women have for additional productive activities.

The estimated monthly income of all the households surveyed is bimodal and ranges between Php 1,001-2,000 (20.38%) and Php 2,001-3,000 (19.62%). But for specific sites the modal income for Rizal is Php 1,001-2,000 (38.34%) while it is Php 2,001-3,000 for Katipunan (32.00%) and Php 4,001-5,000 for Manukan (32.08%). Dipolog have the highest modal income (Php 5,001-10,000). This suggests that the households in Dapitan included in the study are economically better off than those in Rizal and Sibutad, in that order. Being in a city must be an advantage for the said households because of the bigger market of their fish products, aside from other employment opportunities not available in the municipalities.

**Table 7.** Estimated Monthly Household Income

| Income Cohorts | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| <1,000 | 16(15.69) | 2 (4.00) | 9 (16.98) | 17 (28.33) | 44 (16.60) |
| 1,001-2,000 | 14 (13.73) | 8 (16.00) | 9 (16.98) | 23 (38.34) | 54 (20.38) |
| 2,001-3,000 | 11 (10.78) | 16 (32.00) | 10 (18.87) | 15 (25.00) | 52 (19.62) |
| 3,001-4,000 | 10 (9.80) | 11 (22.00) | 2 (3.77) | 2 (3.33) | 25 (9.43) |
| 4,001-5,000 | 13 (12.75) | 6 (12.00) | 17 (32.08) | 3 (5.00) | 39 (14.72) |
| 5,001-10,000 | 23 (22.55) | 6 (12.00) | 4 (7.55) | - | 33 (12.45) |
| >10,000 | 15 (15.69) | 1(2.00) | 2 (3.77) | - | 18 (6.80) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Poverty index.*** By all economic indicators that include monthly household income and reinforced by possession of household amenities and facilities, the observed pattern suggest that the households surveyed in Dipolog are indeed economically better-off than those in its neighbouring municipalities. This observation seems to be reinforced by the poverty index for all the communities along the Dipolog Bay. The poverty index tells the percentage of the households in a community whose mean monthly income fall below the poverty threshold set at the national level of Php 6,195 during the period of the survey (NSDB 2007). The data show that the poverty index of Roxas is highest (63.64%) and closely followed by Manukan (62.55%) then Katipunan (58.87%). The poverty index of Dipolog is only 23% which suggests that it has the least number of impoverished households.

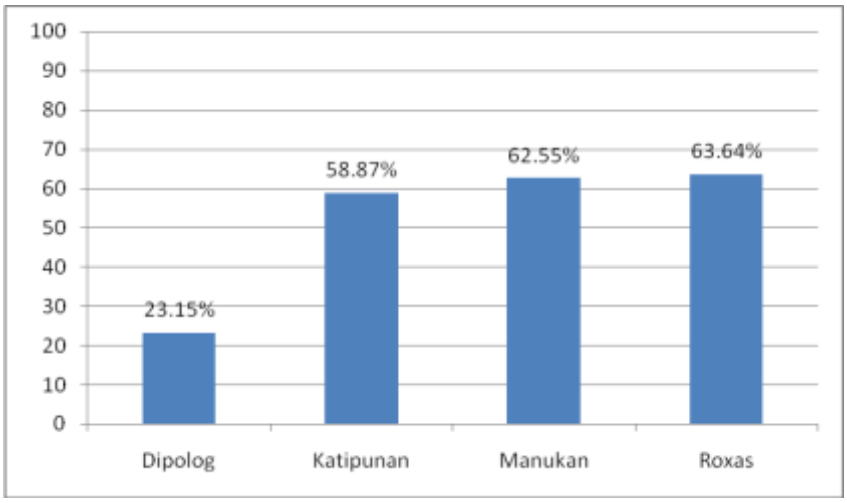


**Figure 7.** Poverty indices of communities surveyed (PEF 2006)

***Migration.*** Twelve percent or 32 of all the households had reportedly transferred residence at least one time. Dipolog has 17% of its households that had migrated while Manukan has 12% as compared to those in Katipunan (6.00%) and Roxas (3.33%). The most common direction of transfer of residence of all those that had migrated is from another barangay of the same town (54.28%) as compared to those from another town (23.81%), another province (14.52%) and another city or region (5.00%). Others have not cited their places of origin.

The foremost reason cited for migration of all the households surveyed was economic (59.24%) while a few was driven by poor peace and order situation (11.70%), to be with relatives (8.68%) and the quest for better education of children (9%). Others have a combination of economic and education reasons which actually summarize the push for migration in these communities.

## Settlement Characteristics

***Farm ownership.*** Almost 71% of the households do not own a farm and close to 11% own only up to one hectare, which is to be expected because the majority have fishing as their primary source of income. In Dipolog, farm ownership runs even beyond five hectares which is not the case in Katipunan, and Roxas where it is limited to less than one hectare. About 9% of the households surveyed in Dipolog have farms between 4.1 to 5.0 hectares. This information further supports the poverty indices mentioned earlier.

**Table 8.** Size of Farmland Owned

| Farm Size | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| None | 77 (75.50) | 33 (66.00) | 24 (45.28) | 54 (90.00) | 188 (70.94) |
| 0.1 – 1.0 | 8 (7.84) | 6 (12.00) | 12 (22.64) | 3 (5.00) | 29 (10.94) |
| 1.1 – 2.0 | 2 (1.96) | - | - | - | 2 (0.76) |
| 2.1 – 3.0 | 1 (0.98) | - | - | - | 1 (0.38) |
| 3.1 – 4.0 | 1 (0.98) | - | - | - | 1 (0.38) |
| 4.1 – 5.0 | 9 (8.82) | - | - | - | 9 (3.39) |
| > 5.0 | 4 (3.92) | - | 1 (1.89) | - | 5 (1.89) |
| No answer | - | 11 (22.00) | 16 (30.19) | 3 (5.00) | 30 (11.32) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (92.08) |

***House ownership.*** Eighty-six percent of the households admitted to own or have built the houses which they occupied during the period of the study, while only about 6% said that they rented. Others are allowed free use (5.66%) and had inherited their houses (2.64%). The percentage of those that rented their houses is higher in Dipolog (12.75%) than in Manukan (3.77%) which seems to be a reflection of its being a city.

**Table 9.** Household Ownership of House

| Ownership of House | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Own house | 76 (74.51) | 47 (94.00) | 47 (88.68) | 58 (96.67) | 228 (86.04) |
| Rented | 13 (12.75) | - | 2 (3.77) | - | 15 (5.66) |
| Free use | 9 (8.82) | 2 (4.00) | 3 (5.66) | 1 (1.67) | 15 (5.66) |
| Inherited | 4 (3.92) | 1 (2.00) | 1 (1.89) | 1 (1.67) | 7 (2.64) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Roofing materials.*** The use of light materials like nipa or cogon for roofing of houses was reported by majority of the households (66.79%) while the rest have galvanized iron sheets (21.89%), a combination of galvanized iron sheets and nipa (7.55%) and other materials (3.77%). Houses with nipa or cogon roofing are dominantly observed in Katipunan (84.00%) while Dipolog (33.33%) was highest among those households that use galvanized iron. Meanwhile, Manukan excels among households with a combination of nipa and galvanized iron sheets (15.09%) which suggest the availability and affordability of both materials for the said households.

**Table 10.** Types of Roofing Materials

| Roofing Materials | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Nipa or cogon | 59 (57.84) | 42 (84.00) | 35 (66.04) | 41 (68.33) | 177 (66.79) |
| Galvanized iron | 34 (33.33) | 5 (10.00) | 6 (11.32) | 13 (21.67) | 58 (21.89) |
| Combination of nipa and galvanized iron | 8 (7.84) | 3 (6.00) | 8 (15.09) | 1 (1.67) | 20 (7.55) |
| Others | 1 (0.98) | - | 4 (7.55) | 5 (8.33) | 10 (3.77) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Fuel for cooking.*** Eighty-nine percent depend on firewood for cooking. The use of charcoal (6.42%) and liquefied petroleum gas (3.40%) is not very popular if firewood is locally available. Although there is no data to tell that firewood is purchased but considering that the households are either directly along the coast or in rural areas, securing wood is probably easier than having to buy charcoal and liquefied petroleum gas with cash. Making charcoal needs also wood or coconut shells that may be cumbersome to the household than to pick up drift wood or cutting branches around or along the shoreline. Charcoal use is reported in Roxas (20.00%) and Dipolog (7.84%) while liquefied petroleum gas is only reported in the latter (7.84%).

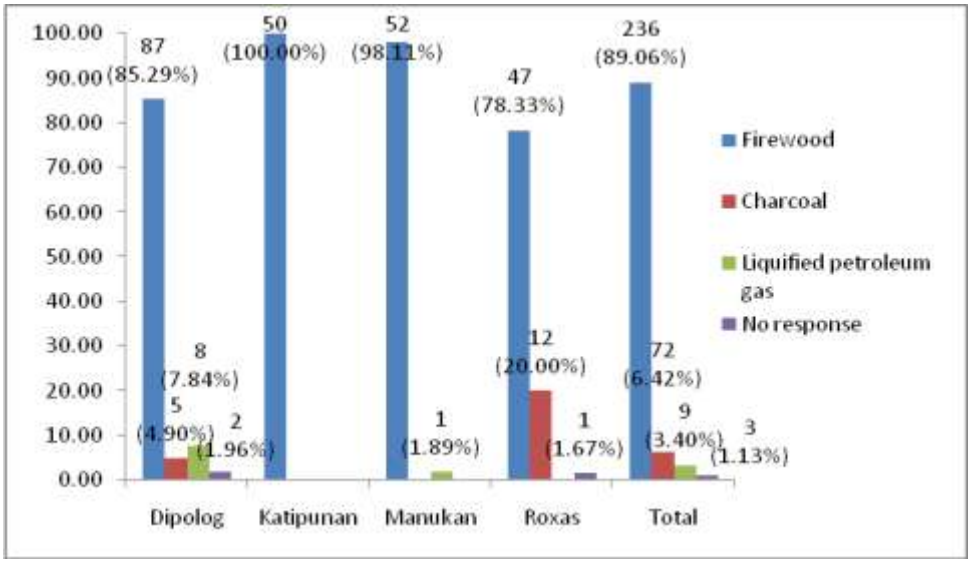


**Figure 8.** Fuel used in cooking at home.

***Toilet facilities.*** The majority of the households reported having their own toilet, but the distribution varies. All households surveyed in Roxas have toilets unlike in Manukan (92.31%), Katipunan (74.00%) and Dipolog (73.73%) where there are households without toilets. Most of these toilets are of the manual water sealed type. The majority of those without toilets use a toilet of their neighbours and relatives. Communal toilets are reported only by the residents of Dipolog while defecating in open spaces like in grassland or shrub areas is common among coastal households in Katipunan.

***Drinking water.*** Communal faucet as source of drinking water is reported by 41% of all the households surveyed but this is not true of some sites in Manukan shallow well is most common (66.04%) and owned faucet in Dipolog (33.33%). Dipolog has a variety of reported sources of drinking water while Katipunan and Roxas just rely on communal faucet and shallow well. Nonetheless, the sources of drinking water among the communities surveyed seem to be safe based on the type reported as compared to having open-well and spring as found among few households in Manukan and Dipolog.

**Table 11.** Sources of Drinking Water

| Sources of Drinking Waters | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Communal faucet | 19 (18.63) | 36 (72.00) | 3 (5.66) | 51 (85.00) | 109 (41.13) |
| Jetmatic or shallow well | 22 (21.57) | 14 (28.00) | 35 (66.04) | 9 (15.00) | 80 (30.19) |
| Owned faucet | 34 (33.33) | - | 1 (1.89) | - | 35 (13.21) |
| Artesian or deep well | 22 (21.57) | - | - | - | 25 (9.43) |
| Open-well | 3 (2.94) | - | 5 (9.43) | - | 8 (3.02) |
| Spring | 1 (0.98) | - | 6 (11.32) | - | 7 (2.64) |
| No answer | 1(0.98) | | | | 1(0.38) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Vehicle ownership.*** Eighty percent of surveyed households do not own any vehicle. Of the 20% owning vehicles most were from Dipolog and Roxas which Table 7 and Figure 7 above indicate have fishing households which are relatively better off than their neighbouring communities. Almost 11% have a motorcycle and 9% a bicycle. No households admitted owning a four-wheeled vehicle. Most of the households with a motorcycle were from Dipolog (18.63%), followed by Roxas (13.33%).

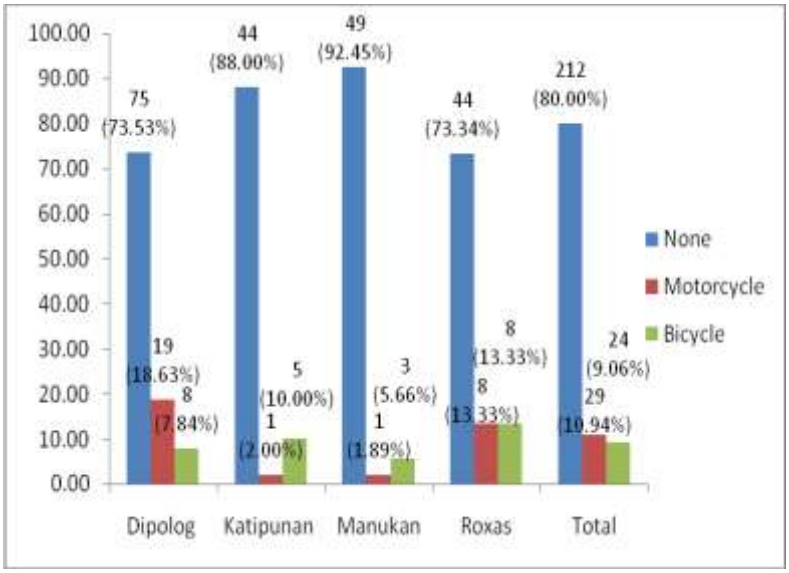


**Figure 9.** Vehicles owned by households.

***Lighting facilities.*** Access to electricity is not a problem because of the electric cooperatives that are already institutionalized in the country. The data show that almost 83% of all surveyed households have electricity, with virtually all households in Roxas (96.67%) having electricity, which was higher than neighbouring communities. Dipolog City has only 89% of surveyed households with electrical lighting and other uses. Households without electricity use kerosene lamps (11.32%) and Petromax (0.38%) for lighting.

**Table 12.** Types of Lighting

| Lighting Facilities | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Electricity | 91 (89.22) | 39 (78.00) | 45 (84.91) | 58 (96.67) | 233 (87.92) |
| Kerosene lamp | 9 (8.82) | 11 (22.00) | 8 (15.09) | 2 (3.33) | 30 (11.32) |
| Petromax | 1 (0.98) | - | - | - | 1 (0.38) |
| No answer | 1 (0.98) | - | - | - | 1 (0.38) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Equipment and appliances.*** Only about 25% of the respondents said that they have household members that have a cell phone which is more personal than a collective property. Also, only about 24% have television sets which can be linked to their access to electricity. Having transistor radio, which were more common in past before televisions and/or compact disc players had become popular, is reportedly owned by only 21% of households in all the surveyed communities. In general, since the ownership of electronic equipment and other household appliances was not common, and this probably reflects the low purchasing power of households or having other priorities on which to spend their limited income.

**Table 13.** Electronic Equipment and Appliances Owned

| Equipment and Appliances | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Cell phone | 27 (26.47) | 15 (30.00) | 10 (18.87) | 13 (21.67) | 65 (24.53) |
| Television | 29 (28.43) | 15 (30.00) | 7 (13.21) | 12 (20.00) | 63 (23.77) |
| Transistor radio | 13 (12.75) | 10 (20.00) | 20 (37.74) | 13 (21.67) | 56 (21.13) |
| Cassette recorder | 8 (7.84) | 2 (4.00) | 8 (15.09) | 7 (11.67) | 25 (9.43) |
| CD/DVD video player | 14 (13.73) | 3 (6.00) | 5 (9.43) | 2 (3.33) | 24 (9.06) |
| CD/DVD music player | 5 (4.90) | 1 (2.00) | 3 (5.66) | 11 (18.33) | 20 (7.55) |
| Cable television | 5 (4.90) | 1 (2.00) | - | 1 (1.67) | 7 (2.64) |
| Personal computer | 1 (0.98) | - | - | 1 (1.67) | 2 (0.75) |
| Internet connection | - | 1 (2.00) | - | - | 1 (0.38) |
| Others | - | 2 (5.00) | - | - | 2 (0.76) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

## Summary

The location of coastal communities of Dipolog, Katipunan, Manukan and Roxas relative to Dipolog Bay has made this body of water the major life sustenance for the majority of households which are heavily reliant on fishing and related economic activities. With a modal household size of four and of nuclear type, household eke a living from what natural resources are available in their immediate environment. The current household size may be small, but a close examination of the age distribution of the population shows that 51% belong to age cohorts from 0 to 19 years. This suggests a young population that may put more pressure on existing fishery resources within Dipolog Bay in the very near future. With limited education, where overall over 40% of respondents have only attended but not completed elementary school, many people are unable to diversify out of fishing and/or related fishery dependent livelihoods.

The present household income is bimodal and ranges between Php 1,001 to Php 3,000 per month but those households in Dipolog which are more urbanized seemingly have higher modal incomes. Dipolog also shows a lower poverty index compared to the other sites. Although economics is cited as a major reason for transfer of residence, most migration was localized or within the same town, however migration is uncommonly with only 12% reported having moved location. Thus, the resources in Dipolog Bay will be more exposed to population pressure in coming years.

By all indicators, the households surveyed owned less and had few electrical appliances. Only about 29% of the households owned farmland and for the majority less than one hectare. Houses are typically made of light materials and their drinking water was mainly from communal faucets. The availability of water also allowed the majority to have a water-sealed toilet. As result of the rural electrification program of the government, the majority have electricity for lighting and to power the appliances, though few households have electrical appliances. However the cost of electricity and the cost of electronic equipment, can be a strain on households with low incomes. This would mean more effort to generate income from the natural resource base and particularly for households that rely heavily upon fishing. There is a need to train households how to use electricity for productive ends rather than only for recreational purposes.

# Chapter III

# COASTAL RESOURCES AND FISHERIES CO-MANAGEMENT

Given the importance of fishery resources to developing countries like the Philippines, it is imperative that these are managed sustainably. A key to this is to have an understanding of the state of fisheries resources and the marine ecosystems that support them. This chapter presents the status and trends of the coastal and fishery resources of Dipolog Bay which support the major livelihood of households in the coastal communities of Dipolog, Katipunan, Manukan and Roxas.

## Coastal Resources

Dipolog Bay is a major fishing ground of the coastal communities of Dipolog City and the municipalities of Katipunan, Manukan and Roxas as well as the other nearby municipalities. Its water mass includes the eastern part of Sulu Sea and it receives discharges from six major rivers, namely: Dipolog (Barra), Lubungan (Olingan-Taga), Dikayu (Katipunan), Piao (Roxas) and Dohinob (Roxas). This chapter discusses the status and trends of the coastal and fisheries encompassing the bay.

***Mangroves.*** Based on the secondary data collected, most of the mangrove communities along Dipolog Bay are found in Dipolog and Katipunan and are generally river or creek mangroves inhabiting river mouths reaching farther inland. The Participatory Coastal Resource Assessment (PCRA) results conducted by PENRO-ZDN and CENRO-Dipolog (2008) estimated about 28 hectares of mangrove area in Dipolog City and eight hectares each in the barangays of Olingan and Miputak, four hectares each in the barangays of Barra and Sicayab and two hectares each in the barangays of Minaog and Galas. A separate PCRA conducted by the same team in 2009 estimated approximately three hectares of mangrove in Katipunan, Zambaonga del Norte, with more than half of it (1.5 hectare) situated in San Antonio, which is privately owned. The municipality of Manukan, on the other hand, is devoid of mangroves, except for a few patches of nipa or *Nypa fruticans* in Linay and neighbouring barangays (PENRO-ZDN and CENRO-Dipolog, 2009).

Based on the PCRA proceedings of Dipolog (PENRO-ZDN and CENRO-Dipolog, 2008), Katipunan (PENRO-ZDN and CENRO-Dipolog , 2009) and Manukan (PENRO-ZDN and CENRO-Dipolog, 2009), Dipolog Bay has 16 mangrove species comprising nine species of true mangroves (see Table 14): “bakhaw laki” (*Rhizophora apiculata*), “bakhaw baye” (*R. mucronata*), “piapi”(*Avicennia*), “pagatpat” (*Sonneratia alba*), “pedada” (*S. caseolaris*), “tangal” (*Ceriops tagal*), “pototan” (*Bruguiera sexangula*), “dungon” (*Heritiera littoralis*) and “nipa” (*Nypa fruticans*) and seven (7) species of mangrove associates: “lagolo” (*Acrostichum aureum*), fern or “pako” (*A. speciosum*), ”tigbao” (*Acanthus ebracteatus*),

"tiui" (*Dolichandrone spathacea*), "talisay" (*Terminalia catappa*), bitaog, and "putat" (*Barringtonia racemosa*). About 16 species were identified in Dipolog and 13 species in Katipunan.

Stem density, basal area and stand basal of mangroves in Dipolog City were determined and these are summarized in Table 15. As revealed by the distribution, Sta. Filomena (Ramos Village) appeared to have the densest mangroves (6,500 trees/ha), but the second to smallest stand basal area (0.349 $m^2$/ha) which indicates the dominance of small trees as observed during the survey. Miputak shows the greatest stand basal area (1.621 $m^2$/ha), followed by the mangroves in Olingan (1.422 $m^2$/ha). These were likewise noted during the exposure to more mature trees in Miputak and Olingan.

*Nypa fruticans* or "nipa" has formed an extensive and dense stands along almost all riverbanks and swamps reaching farther inland in Dipolog, particularly in the barangays of Olingan, Miputak, Galas and Minaog. The abundance of *N. fruticans* in the area gives the community a means of livelihood. Its fronds or leaves are harvested and made into roofing materials which are sold at Php 400-500 per 100 pieces (Figure 9). However, a large chunk of the nipa area in Olingan, Galas and Minaog has been converted into a sports complex, commercial and residential areas. Moreover, some mangrove areas in Dipolog Bay are claimed as private property.

Table 14. List of Mangrove Species Found in Dipolog Bay

| Scientific Name | Common name |
|---|---|
| Mangrove Associates | |
| ACANTHACEAE | |
| *Acanthus ebracteatus* | *Tigbau* |
| BIGNONIACEAE | |
| *Dolichandrone spathacea* | *Tiui* |
| COMBRETACEAE | |
| *Terminalia catappa* | *Talisay* |
| *Unidentified* | *Bitaog* |
| LECYTHIDACEAE | |
| *Barringtonia racemosa* | *Putat* |
| PTERIDACEAE | |
| *Acrostichum aureum* | *Lagolo* |
| *Acrostichum speciosum* | *Fern* |
| True Mangroves | |
| AVICENNIACEAE | |
| *Avicennia (officinalis) lanata* | *Piapi* |
| COMBRETACEAE | |
| *Heritiera littoralis* | *Dungon* |
| PALMAE | |
| *Nypa fruticans* | *Nipa* |
| RHIZOPHORACEAE | |
| *Bruguiera sexangula* | *Pototan* |
| *Ceriops tagal* | *Tangal* |
| *Rhizophora mucronata* | *Bakhaw baye* |
| *Rhizophora apiculata* | *Bakhaw laki* |
| SONNERATIACEAE | |
| *Sonneratia alba* | *Pagatpat* |
| *Sonneratia caseolaris* | *Pedada* |

**Table 15.** Stem Densities and Stand Basal Areas of True Mangroves in Dipolog Bay

| | Local Name | Barangays | | | | |
|---|---|---|---|---|---|---|
| | | Olingan | Miputak | Sta. Felomina | Minaog | Average |
| Diversity | | 5 | 5 | 2 | 7 | 4.75 |
| Stem Density (average number of trees per plot) | | 22 | 24.4 | 65 | 11.57 | 30.74 |
| Stand Density ($ha^{-1}$) | | 2200 | 2440 | 6500 | 1157 | 3074.25 |
| Stand BA ($m^2$ $ha^{-1}$) | | 1.422 | 1.621 | 0.349 | 0.341 | 0.93325 |
| **Species BA ($m^2$ $ha^{-1}$)** | | | | | | |
| AVICENNIACEAE | | | | | | |
| *Avicennia alba* | Piyapi laki | 0.036 | 0.67 | - | - | 0.18 |
| *A. ebracatus* | Lagiwliw | 0.028 | 0.104 | - | - | 0.03 |
| *A. marina* | Piyapi baye | 0.919 | 0.338 | - | 0.025 | 0.32 |
| *A. officinalis* | Bugalon | - | - | - | 0.198 | 0.05 |
| RHIZOPHORACEAE | | | | | | |
| *Rhizopora apiculata* | Bakhaw laki | 0.104 | 0.175 | - | - | 0.070 |
| *R. mucronata* | Bakhaw baye | - | - | - | 0.018 | 0.005 |
| *R. stylosa* | Bakhaw bato | - | - | 0.295 | - | 0.074 |
| SONNERATIACEAE | | | | | | |
| *Sonneratia alba* | Pagatpat | 0.335 | 0.334 | - | 0.004 | 0.168 |
| *S. ovate* | Pedada | - | - | 0.054 | 0.025 | 0.020 |
| *S. caseolaris* | Bayabason | - | - | - | 0.014 | 0.004 |
| COMBRETACEAE | | | | | | |
| *Heritiera littoralis* | Dungon | - | - | - | 0.057 | 0.014 |
| PALMAE | | | | | | |
| *Nypa fruticans* | Nipa | | | | | |


**Figure 10.** Display of *Nypa* roofing materials along the road in Galas, Dipolog City.

***Seagrasses.*** Secondary data show the absence of seagrasses in Dipolog Bay (PENRO-ZDN & CENRO-Dipolog, 2008). Seagrasses survive in the intertidal zone especially in locations sheltered from wave action or where there is pooling of water at low tide which protects seagrass from elevated temperature and drying. Dipolog Bay is generally exposed to

strong wave action during the southwest monsoon which may not allow the seagrasses to anchor and grow in the area.

***Coral reefs***. The PCRA conducted in Dipolog City and Manukan revealed the presence of coral reef areas in the latter town (PENRO-ZDN and CENRO Dipolog City 2008; 2009). A survey conducted by Cadiz *et al*. in 2009 revealed poor coral cover (17.25%) in Linay Marine Sanctuary with about 50.19% silted sand substrate (Figure 10). Coral growths were patches of massive *Porites* (Figure 11). There were 9 families and 11 genera of corals identified. The presence of invertebrates such as crinoids, hydroids and sponges indicated a favourable habitat for these organisms. These organisms seem to favour silted areas (Figure 12).

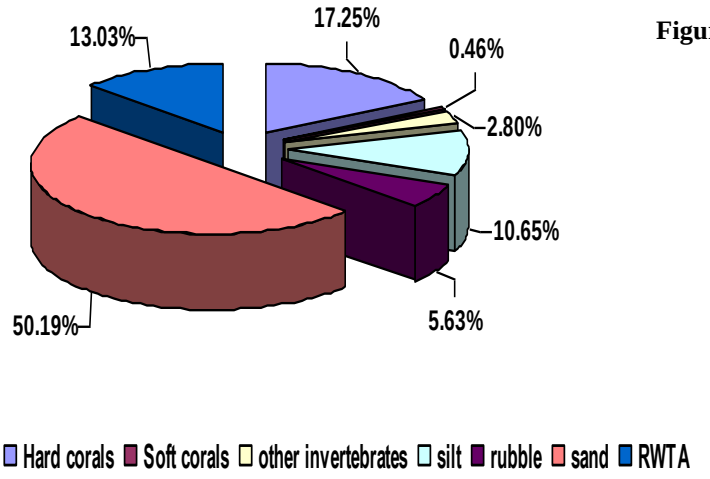


**Figure 11.** Per cent cover of the MPA in Linay, Manukan (Cadiz, *et al.*, 2009). RWTA- rock with turf algae.

**Figure 12.** Massive form of *Porites* sp. in Linay Marine Sanctuary.

**Figure 13.** Hydroids and crinoids which were abundant in Linay Marine Sanctuary during the July 2009 survey conducted by SU-IEMS and JRMSU (Cadiz *et al.*, 2009).

A survey conducted by de Guzman and Garcia (2010) on the same marine sanctuary still revealed poor coral cover (17%) (Figure 13). A proposed marine sanctuary in Barangay San Antonio was also assessed and found to have poor coral cover (19%) (Figure13). The poor quality of the reefs in Manukan could be attributed to the high siltation in the area. Visibility in Linay was 2-3 meters while in Dequis was less than a meter (Cadiz *et al*., 2009).

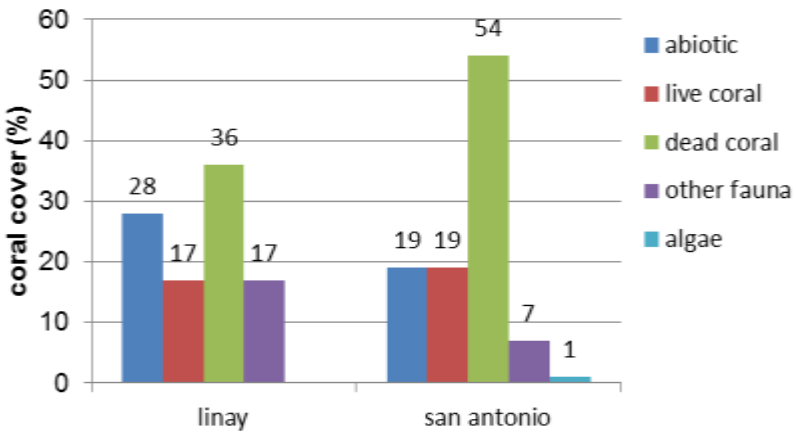


**Figure 14.** Percent cover of the different major lifeform categories in two coral reef areas in Manukan (de Guzman & Garcia, 2010).

***Reef fishes.*** Over 53 fish species were identified in the two reefs (Figure 14) (de Guzman & Garcia, 2010). There were more target species, as well as indicator ones found in Linay. Species belonging to the family Chaetodontidae are indicators of good reef health because they feed on polyps of corals. Target species are targeted by fishers because they generally command the highest prices. On average, there were 280 fish per 500 $m^2$ (±35.35) which is considered poor with respect to the entire country (Hilomen *et al.*, 2000). In terms of

fish biomass, Table 16 reveals that target fish still have the highest values compared to other fish categories, with San Antonio having the highest despite the fact that it was not yet protected at the time of the survey. However, the values (8.16-13.58 ton/km$^2$) were considered under low category (5.1-20.0 ton/ km$^2$) (de Guzman & Garcia, 2010; Hilomen *et al.*, 2000).

**Table 16.** Number of Fish Species and Fish Densities (ind./500m$^2$) (de Guzman & Garcia, 2010)

| Fish Category | Number of Species | | Density (Ind./500m$^2$) | | Biomass Kg/500 m$^2$) | |
|---|---|---|---|---|---|---|
| | Linay | San Antonio | Linay | San Antonio | Linay | San Antonio |
| Target fish | 34 | 28 | 151 | 148 | 4.08 | 6.79 |
| Indicator | 9 | 2 | 16 | 3 | 0.21 | 1.74 |
| Major demersal | 10 | 13 | 88 | 153 | 0.46 | 0.34 |
| Total | 53 | 43 | 255 | 305 | 4.76 | 8.87 |

## Marine Protected Areas

Dipolog Bay has two existing marine protected areas (MPA) or marine sanctuaries. These are all located in Manukan, and are the Linay and Dequis Marine Sanctuaries (Figure 14). Both were delineated in 2009 through the collective efforts of the local government unit of Manukan, Silliman University and Jose Rizal Memorial State University. Linay Marine Sanctuary is about 80 hectares with depths of 7 – 12 metres. Visibility of the water was poor, 2-3 meters and substrate cover was dominantly composed of sand (50%) when surveyed in 2009. Dequis on the other hand, is about 40 hectares and had a very poor visibility (< 30 cm) having only one family of corals in three genera (Appendix 1).

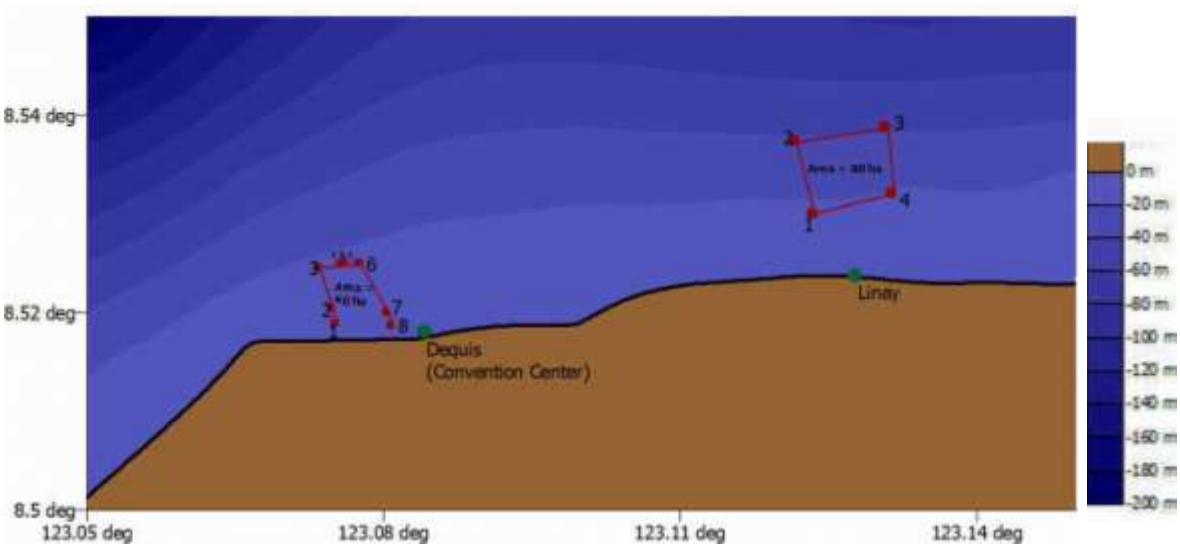


**Figure 15.** Boundaries of Linay and Dequis/Poblacion MPAs.

The most dominant substrates in the protected area were described as heavily silted coral rubbles and big rocks (Figure 15). With the estuary nearby, it would be difficult for the corals to recover. Some parts of the sanctuary were soft-bottom and used to be the fishing ground for “andres-andres” or *Paphia textile*, hence, the MPA can be delineated again for the conservation and management of the clam which is now heavily exploited because of its commercial importance and export potential.

**Figure 16.** Note the thick layer of silt covering the rocky substrates in Linay.

## Status of Fisheries Resources

There are 26 coastal barangays along Dipolog Bay (Dipolog = 7; Katipunan = 5; Roxas = 6; Manukan =8) with 18 fish landing sites, six of which were major landing sites: three in Dipolog (Sicayab, Barra, Laoy Olingan), one in Katipunan (San Antonio), one in Roxas (Lower Irasan) and one in Manukan (Lipras).

***Number of fishers and registered boats.*** According to de la Pena (2006), Dipolog Bay has 1,418 fishers wherein 85% (or 1,206) of which were municipal fishers and almost 15% (or 212) were commercial fishers. The PCRA conducted in Dipolog in 2008 reported 1,791 full time fishers and 1,003 part time fishers in its coastal communities (PENRO ZDN & CENRO- Dipolog, 2008). A similar survey done in Manukan and Katipunan in 2009 reported 745 full time fishers and 1,181 part time ones in the former and 262 full time and 83 part time in the latter (PENRO ZDN & CENRO-Dipolog, 2009). Pooling the results of the three reports, there were a total of 2,798 full time and 2,267 part time fishers in the bay in 2008-2009 which was about 97% increase in the number of full time fishers within two to three years (2006 to 2008-2009). Based on the study of de la Pena (2006) and the PCRA results, the seven coastal barangays of Dipolog accounted for more than one-half of the total number of fishers in the bay.

There were about 1,471 motorized and 1,425 non-motorized boats operating in Dipolog Bay based on the latest available data. Results of the PCRA conducted in Dipolog, Katipunan and Manukan (PENRO ZDN & CENRO Dipolog, 2008; 2009), revealed 14 registered commercial fishing boats, the majority of which were from Dipolog.

**Table 17.** Number of Recorded Motorized and Non-Motorized Boats

| Communities | Type of Boat | | Sources of Information |
|---|---|---|---|
| | Motorized | Non-Motorized | |
| Dipolog | 774 | 207 | PENRO-ZDN & CENRO, 2008 |
| Katipunan | 55 | 272 | Katipunan, Municipal Fisheries Profile, MAO |
| Roxas | 205 | 82 | Roxas, Municipal Fisheries Profile, MAO |
| Manukan | 437 | 864 | Manukan, Municipal Fisheries Profile, MAO |
| Total | 1,471 | 1,425 | |

***Fishing gears and catch per unit effort.*** The fishing gears commonly used in Dipolog Bay are classified into ten types recorded from actual catch monitoring conducted in December 2010. This number was smaller compared to the result obtained by de la Pena in 2006 which recorded 15 gear types (a decrease of about 33%). In the present study, hook and line or "tonton" or "pasul" was the most common with 56 units and followed by surface set gillnets (52 units) and beach seines or "bira-bira" (47 units). In terms of efficiency, pamo/pantuloy or the surface set gillnet has the highest CPUE (3.52 ±2.24 kg/hour) followed by "palangre" or bottom set long line (3.51 ±3.39 kg/hour) and "pakaras" or the surface set long line (CPUE, 3.44 ±2.86 kg/hour).

**Table 18.** Catch Per Unit Effort (kg/hour) Per Fishing Gear

| Fishing Gear | | Dipolog | | Katipunan | | Roxas | | Manukan | |
|---|---|---|---|---|---|---|---|---|---|
| Common Name | Local | # of Units | Average CPUE | # of Units | Average CPUE | # of Units | Average CPUE | # of Units | Average CPUE |
| Beach seine | Bira-Bira/ Baling | 40 | 0.88 ±0.62 | | | 3 | 2.41 ±0.71 | 4 | 1.90 ±0.77 |
| Surface set Longline | Pakaras | 6 | 3.44 ±2.86 | | | 5 | 2.37 ±0.43 | | |
| Surface set gillnet | Patuloy/ Pamo | 34 | 2.06 ±2.08 | 11 | 3.52 ±2.24 | 2 | 2.03 ±0.66 | 5 | 1.26 ±1.10 |
| Fish pot | Koralon | | | 8 | 0.47 ±0.16 | | | | |
| Drift gillnet | Kurantay | | | 1 | 3.33 ±0.01 | 4 | 1.94 ±0.58 | | |
| Encircling gillnet | Likos/ Likos | | | 4 | 0.95 ±0.32 | | | | |
| Bottom set longline | Palangre | | | 29 | 3.51 ±3.39 | | | 13 | 1.53 ±1.04 |
| Bottom set gillnet | Palungdang | | | 4 | 2.06 ±1.56 | 2 | 1.2 ±0.37 | 1 | 1.25 ±0.01 |
| Hook and line | Tonton/ Pasul | | | 1 | 0.50 ±0.01 | | | 55 | 1.07 ±0.76 |
| Bottom set - surface Set longline | Panalat/ Pakatay | | | | | 7 | 2.22 ±0.53 | | |

The study of de la Pena (2006) indicated the driftnet was the most widely used in the bay, followed by gillnet, handline, trolling line and set longline. The driftnet is an active gear which accounted for more than 30% of the total number of gears in the Bay. It is effective and efficient in catching sardines and other pelagic species, however, it is considered destructive to the fishery resource in terms of by-catch and/or waste to the target species especially during peak season (de la Pena, 2006). It was estimated by fishers that more than half of the sardines catch was either unsold fresh (and so was salted, dried or given away to neighbours) or used as fish meal. In 2006, there were 227 drift-netters in Dipolog Bay, about 45% of which was from Barangay Sicayab, Dipolog City.

***Catch per species (weight) per gear.*** In terms of total catch, the surface set gillnet (pantuloy/pamo) registered the most efficient gear having 798.6 kg catch which was composed mainly of "bolinaw" or *Stolephorus* spp. (Family Engraulidae) with total weight of 144 kg (Appendix 2). Sardines had a combined weight of 230 kg, 159 kg tuloy (Sardinella *lemuru*, 48 kg "lupoy" or sardines fry, 20 kg "malangse" (*Sardinella gibbosa*) and 3 kg "hilos-hilos" (*Dussumiera* spp).

The drift gillnet (kurantay) had the second highest catch, 647 kg and appeared to have the most diverse having caught 27 fish species (Appendix 2). "Mudlong" or *Selar crumenophthalmus* (Family Carangidae) dominated its catch (290 kg), followed by "balo" or *Strongyla* spp. (Family Belonidae) with a total weight of 200 kg. As the third most efficient gear, hook and line had a total catch of 472.15 kg composed of 21 species (under eight families) dominated by pelagic species particularly, "diwit" of Family Trichiuridae (109.8 kg), "sambagon" of Family Scombridae (93.90 kg) and tamarong of Family Carangidae (92.05 kg) (Appendix 2).

Meanwhile, Appendix 3 reflects the relative abundance of the fish species caught in Dipolog Bay.

***Fishing practices.*** Dipolog Bay is partly sheltered during the northeast monsoon or "amihan" (November to March) and exposed during the southwest monsoon or "habagat" (June to October), hence, fishing activities depend on the prevailing monsoon. In Dipolog City, most of the fishing activities occur during the northeast monsoon regardless of gear type (PENRO-ZN & CENRO-Dipolog, 2008). On the other hand, in Manukan, fishing activities/gears vary with the prevailing monsoon (PENRO-ZN & CENRO-Dipolog, 2009). "Pukot/pamo", "palutaw" (Figure 16), "baling-baling" and "kurantay" (Figure 17) are used during the northeast monsoon, whereas "palundag" or "palugdang", "likos", "palangre", "sud-sud", "bobo" (Figure 18) and "pamalo" are used throughout the year. Hook and line activities were common from March to September.

In Katipunan, almost all recorded fishing gears ("pasul", "taga", "pamo", "baling", "kurantay", "bira-bira") except for "pukot", "laya" and "bontay" are used throughout the year (PENRO-ZN & CENRO-Dipolog, 2009). "Laya" or cast net (Figure 19) is very common in Katipunan area in April and May, where most of their catch was trash fish and big shrimps (Fig. 10). In general, fishing activity is high in the Bay during the calm interim in April to May. In addition, since the Bay has no coral reef, fishers usually operate their gear particularly, the driftnets, near fish aggregating devices (FADs) or "payao".

**Figure 17.** Surface set gillnet ("palutaw ")

**Figure 18.** Driftnet or “pamo” or “kurantay”

**Figure 19.** Fish pot or “bobo”.

**Figure 20.** Shrimps caught

***Fishing conditions***. The market price for fish fluctuates daily and is dependent on the demand, the fish season, the quality and type of fish, and the weather. As reflected in the Municipal Fishery Profile, the market price for fish in Katipunan varies from Php 25/kg for low quality fish like mangsi, to a high Php 200/kg for high-priced fish like prawn, danglay, lapu-lapu and others.

In Roxas, the type and quality of fish has a great influence on its market price. The lowest price of Php 50/kg is observed for fish like herring, sardines or tamban, and slipmouth or sapsap; and the highest price of Php 350/kg for prawn (Roxas Municipal Fisheries Profile, 2008).

***Issues and problems.*** The issues identified in Dipolog Bay which are related to coastal resources are listed on Table 19. Siltation is a major problem which has not been looked into by the concerned government agencies, perhaps because most of the stakeholders have little or do not have knowledge of the importance of coastal resources management. They are unaware or had neglected connections between the upland ecosystem and coastal habitats. Unmanaged solid waste, cutting of mangrove trees, conversion of mangroves to residential and commercial areas, illegal fishing (dynamite, cyanide, fine mesh nets, and compressor) were also mentioned. Moreover, the majority of the participants in the focus group discussion believed that the four municipalities have weak law enforcement by the *bantay dagat*, PNP and local government units. This may be attributed to insufficient financial support and incentives particularly for *bantay dagat.*

**Table 19.** Problems Encountered by Fishers in Dipolog Bay

| Problems Encountered | Dipolog | Katipunan | Manukan | Roxas |
|---|---|---|---|---|
| 1. Siltation | √ | √ | √ | |
| 2. Garbage/Waste disposal in shoreline and mangrove | √ | √ | √ | |
| 3. Quarrying of sand and gravel | √ | √ | | |
| 4. Illegal fishing | √ | √ | √ | √ |
| 5. Encroachment of commercial fishing boats | √ | √ | √ | √ |
| 6. Cutting of mangroves | √ | √ | | |
| 7. Lack of knowledge on coastal resource management | √ | √ | | √ |
| 8. Lack of livelihood activities during lean months | | | | √ |
| 9. Unregulated harvesting of *andres-andres* | √ | √ | √ | √ |
| 10. Weak law enforcement | √ | √ | √ | √ |
| 11. Lack of financial support | | √ | √ | |
| 12. Lack of support from stakeholders | | | √ | |
| 13. Lack o technical staff in monitoring illegally caught fish | √ | | √ | |

## Sardine Fishery

***Production patterns.*** *Sardinella lemuru* or "tuloy" in local dialect is one of the most common small pelagic fish species in Zamboanga del Norte since time immemorial. Sardines are plankton-feeding species which are often associated with high productivity areas brought about by upwellings and/or riverine freshwater discharge (Cury *et al*., 2000; Santos *et al*., 2001).

Sardine production in the province coincides with coastal upwellings from December to February with a pronounced peak from January to February (Villanoy *et al*., 2011). These upwellings are driven by the northeast monsoon (NEM) winds. De Guzman *et al.* (2010) observed the abundance of sardine juveniles (locally known as "lupoy") in the province

during the months of December and January. Using scoop nets ("sigpaw") fishers harvested them for salted (fermented) and dried fish.

Beginning November, most of the fishers in Dipolog Bay, particularly, in Laoy-Olingan (Dipolog City) and Pasil-Lower Irasan (Roxas) switch to sardine fishing. In contrast to the fishers in Sicayab-Bucana in Dapitan, Dipolog Bay fishers used the drift gill net ("pamo") (Figure 20).

Data obtained from 14 sardine processing plants in Dipolog revealed an overall annual production of 397 to 471 tons of bottled sardines, with 24 tons exported by two companies (Legados, 2006).

***Industry players and stakeholders.*** The National Economic Development Authority (NEDA) reported 23 Spanish sardine producers in Zamboanga del Norte (2005). Legados (2006) recorded 14 sardine processing plants in Dipolog Bay area, 11 of which were privately owned (Dipolog Bueno Food corporation, Inc.; Etch Kiu Food Products; Mendoza Industries; Tito Mikes's Food Inc.; Zaragoza Foods Corporation; CL Food Products; Donex Food Products; Tangkay Spanish Sardines; Montano Foods Corporation; Reg8 Food Products and Nazareno Smoked Fish), two government-funded (Dipolog School of Fisheries and Dipolog Women's Association) and one was funded by a cooperative (Bucana Fishermen MP Cooperative). All of these processors, except for Nazareno's Smoked Fish, produced bottled sardines which are sold locally, but two companies: Tito Mike's Food Inc. and Mendoza Industries are exporting their products (Legados, 2006). Four processors also ventured on fermented or salted sardines.

**Figure 21.** The drift gillnet ("pamo") used to catch sardines in Lower Irasan, Roxas.

***Management issues and problems.*** Zamboanga del Norte is suffering from declining catches year by year. The harvest of sardine juveniles (or lupoy) beginning the month of November to January has been observed in Dipolog Bay and the rest of the coastal water of Zamboanga del Norte facing the Sulu Sea and Dipolog Strait. The juveniles were processed either as dried fish or fermented fish by small-scale fishers and sold to local markets. A resource use conflict issue seems to exist between small-scale fishers and bottled sardines producers. Fish fermentation and drying can be done by any fisher since they only require

low capital or investment in contrast to bottled sardine production which involves greater capital investment.

## Aquaculture and Mariculture

There are about 50 hectares of fish ponds recorded along Dipolog Bay owned and managed by ten operators. In 2010, these ponds collectively had an annual production of 8.6 tons, mainly of milkfish (*Chanos chanos*) and shrimps/prawns (Department of Agriculture, Dipolog City, 2009).

## Perceptions on the Status and Allocation of Fishery Resources

***Perceptions on the state of coastal ecosystems.*** The coastal ecosystems in Dipolog Bay which include the mangroves, seagrass beds, coral reefs and estuaries reflects a significant downward trend based on the observation of the local community households in 1990 and 2000 and their prediction to 2020.

The respondents from Dipolog believed that their mangroves were 49% intact in 1990 and expected to declined to 25% by 2020.The other three municipalities: Katipunan (36.4%), Roxas (39.6%) and Manukan (30.8%) were also expected to decline (25.6%, 23.8% and 21.2% respectively) by 2020, although these towns have only strips of mangrove trees or none at all. The decline of this ecosystem is primarily due to its conversion to residential and commercial areas, and particularly in Katipunan.

The same situation was portrayed for the seagrass communities, coral reefs and estuaries where the percentage of intactness was predicted to decrease by 2020. The expected decline of the conditions of these coastal ecosystems can be attributed to the siltation problem in Dipolog Bay brought about by runoff that drains into the major rivers, which eventually empty into the estuaries of the bay. This event is always evident by the river water colour during heavy rains.

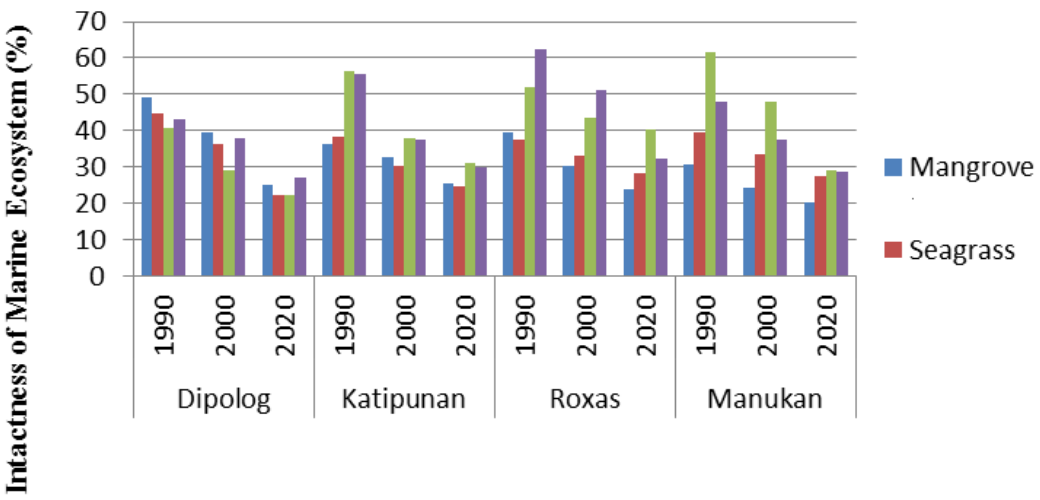


**Figure 22.** Percentage of intactness of different coastal ecosystems.

***Perceptions of supply of fishery resources.*** Fifty-eight percent of the respondents perceived that the supply of fishery resources during the past 12 months or at present compared five years ago is fewer. They feel that it is now more difficult to catch fish compared five years ago because of declining wild natural stocks. More people in Katipunan (84.07%) replied that stocks were less now than five years ago, followed by Manukan (81.13%) and Dipolog (55.88%).

But this is not the case in Roxas where 63% perceived that there was greater supply of fish during the past 12 months than five years ago. Only 10% from Roxas agreed with the perceptions of respondents from the three other study sites. Meanwhile, the remaining respondents are divided between those who said that the quantity of fishery resources had not changed over time (18.11%) and those who believed that the condition now is better than before. As already mentioned, the Roxas respondents led those who are positive about the present condition.

**Table 20.** Perceptions on the Quantity of Fishery Resources Over Time

| Perceptions | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Fewer during the past 12 month compared five years ago | 57 (55.88) | 42 (84.00) | 43 (81.13) | 6 (10.00) | 154 (58.12) |
| Same during the past 12 months compared five years ago | 28 (27.45) | 5 (10.00) | 4 (7.55) | 16 (27.00) | 48 (18.11) |
| Greater during the past 12 months compared five years ago | 5 (4.90) | 3 (6.00) | - | 38 (63.00) | 48 (18.11) |
| No answer | 12 (11.77) | - | 6 (11.32) | - | 15 (5.66) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Access to and allocation of fishery benefits.*** Generally, the majority of respondents (75.10%) stated that there was strong control over commercial fishers from outside fishing within municipal waters. But 21% also said that commercial fishers from within the municipality are allowed to fish within the municipal waters similar to subsistence fishers. This is despite the fact that encroachment of commercial fishers in municipal waters from any origin is prohibited under the Fisheries Code and the preceding observation is in violation of the Fisheries Code.

**Table 21.** Perceptions on the Allocation of Benefits from Fisheries in the Community

| Perceptions | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Commercial fishers from outside the municipality are strongly restricted inside the municipal waters | 69 (67.65) | 43 (86.00) | 38 (71.70) | 49 (81.67) | 199 (75.10) |
| Commercial fishers from within the municipality are allowed to fish in the municipal waters similar to subsistence fishers | 29 (28.43) | 6 (12.00) | 12 (22.64) | 9 (15.00) | 56 (21.13) |
| Commercial fishers and subsistence fishers of any origin are allowed in any municipal waters in the province | 4 (3.92) | 1 (2.00) | 3 (5.66) | 2 (3.33) | 10 (3.77) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

So while there are efforts to secure municipal waters for subsistence fishers the encroachment of commercial fishers has not been completely stopped. This has contributed to the continuing depletion of fishery resources which are supposed to be reserved for fishers using only non-active fishing gears like hook and line, fish traps, fish corrals, etc.

## Summary

Dipolog Bay is a major resource base for the 26 coastal communities of Dipolog City, Katipunan, Manukan and Roxas as well as of nearby municipalities, but the coastal and marine habitats in the area are suffering from several threats and are now in a deteriorating state. Mangrove areas have been reduced in size because these are converted to other uses, while seagrasses are not naturally adapted to the bay. Meanwhile, the coral reefs are in poor condition because they are exposed to siltation. Reef fish density in the area is considered low in comparision with the rest of the country. The two marine protected areas in Manukan are also in poor condition, and need better management interventions.

While the condition of the resource base is deteriorating, the population of fishers is increasing, thus creating an imbalance in the supply and demand. The use of more efficient fishing gears with increasing fishing effort is becoming a common scenario to meet the demands for food of the households of fishers and the market. In some cases, the fishing methods employed are wasteful if not destructive, because the fish taken are of the wrong size and species for making specific fish products and so are either eaten within the household, given away, salted or dried or turned into fish meal. As destructive fishing methods proliferate without check, the quality and quantity of fishery resources is continually deteriorating. The respondents are aware of the issues and problems, both natural and socio-economic, confronting the local fishing economy, particularly the sardine industry which requires addressing on a priority basis.

Both biological data and the perceptions of fishers show the deteriorating condition of the resources in Dipolog Bay. Generally, the majority of respondent fishers felt current catches were less than five years ago because of increased competition for scarce resources. However they have to continue to fish because of limited opportunity to move into alternative livelihoods options.

# Chapter IV

# FISHERIES CO-MANAGEMENT AND STAKEHOLDER PARTICIPATION

The time has come when the responsibility for protecting and conserving aquatic resources upon which coastal communities have depended on for their survival generations can no longer be delegated to only the state, at national and local levels. It requires the cooperative effort of local stakeholders and particularly those who directly derive their income from the seas. This chapter first describes what mechanisms the national government and local government units in the project sites have installed that favour participatory resource management. The dynamics in the households like how men, women and children are involved in community affairs and fisheries management are likewise examined because they reflect how likely it is that co-management at the community level will be feasible.

## Participatory Management Mechanisms

***National law.*** Like the other project sites and elsewhere in the Philippines, the Philippine Constitution serves as the basis for any laws to be passed by legislative bodies both at the national and local levels of governance. Two of the national laws that encourage greater involvement at the local level in environmental protection and conservation, specifically in coastal and marine areas, are the Local Government Code of 1991 (Republic Act 7160) and the Philippine Fisheries Code of 1998 (Republic Act 8550).

The Local Government Code devolves some national functions to the local government units and that includes the management of environmental resources within their jurisdictions. And among those areas, where they are given the authority to do what islegal and deemed necessary are the municipal waters or those waters within 15 kilometres from the shore from the high tide mark. Meanwhile, the Fisheries Code mandates local government units to design measures to conserve and protect fisheries and aquatic resources, but at the same time to ensure the quality of life of municipal fishers by supporting them in various ways to be productive and providing them with supplementary livelihoods.

Both laws encourage the participation of non-government and people's organizations in the decision-making process and the management of coastal and marine resources. It is not difficult, therefore, to introduce participatory management or co-management regimes among the local government units at the project sites because the legal foundations are already in place. It is only a matter of encouraging the various stakeholders to come together and to work for the common good, rather than for personal economic or political interests.

***Local initiatives.*** The 87th regular session of the 12th *Sangguniang Panlungsod* of Dipolog passed on March 3, 2009 Ordinance No. 09-213 which is also known as the Basic Fishery Ordinance. This is purposely considered for the regulation of the fishing industry and

fisheries within the city. The ordinance is enforced in conjunction with other laws, decrees, orders, rules and regulations on fishing and fisheries currently existing. The City Agriculturist Office is tasked to implement the provisions of the ordinance in coordination with other offices of the city.

On the other hand, Manukan has its own version of the fisheries ordinance which is Municipal Ordinance (MO) No. 01 s. of 2008. This is an amendment of MO No. 04, s. of 2004 and MO No. 03, s. of 2006. The Basic Municipal Fisheries Ordinance of Manukan, like those of the other municipalities, regulates the fishing industry and fisheries within its municipal waters. Since this was designed in accordance with RA 8550, there are provisions which encourage participatory management.

## Stakeholders in Coastal and Fisheries Management

The main direct stakeholders of coastal and fishery resources are fishing households and those others who are primarily dependent for their subsistence from what the sea can offer. Their interests are purely economic and they surely will do whatever they can in order to meet their survival needs. This is where the state comes in to regulate the manner coastal and fishery resources are exploited in order to ensure that the supply will last until the next generation. The Philippine government passes laws like the Local Government Code and Fisheries Code to serve as the basis for designing programs, policies and regulations that will inform local government units and the fishing industry on what they can and cannot do, regarding the management and utilization of coastal and fishery resources.

Therefore, the Department of Interior and Local Government (DILG), the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR), the Department of Environment and Natural Resources (DENR) and other related national and local offices are the government stakeholders that are responsible for enforcing laws and implementing programs for the protection and conservation of coastal and fishery resources. Aside from the fishing households and other coastal residents and business establishments, there are also organized groups of fishers and other people's organization that serve as direct stakeholders that assist the government in enforcement and management to secure the quality of the marine environment. Some have become members of the City or Municipal Fisheries and Aquatic Management Council (FARMC).

Table 22 presents the names of people's organizations at the project sites, however, there are only six that are composed of fishers or whose activities are related to fishery products. This suggests the need to have organized groups of fishers in every coastal barangay in the project sites, in order to have a ready pool of human resources that can be mobilized when or if environmental projects are introduced. Moreover, having organized fishers who are environmentally informed and concerned about sustainable utilization of coastal and fishery resources can lessen the cost of environmental law enforcement and increase the positive results of co-management efforts.

**Table 22.** Names of People's Organizations

| People's Organizations | Barangays |
|---|---|
| Dipolog | |
| Nagkakaisang Lakas ng Mangingisda sa Mindanao<br>Olingan Fish Catcher's Association<br>Olingan Motorcab Operators and Drivers Association<br>Olingan Soap Making Association<br>Purok Parpagayo Women's Effectiveness Association<br>Olingan Relocation People Organization<br>Relocation Site Women's Association | Olingan |
| Agura Blende Circle<br>Galas Farmer's Association<br>Galas Sikad-sikad Drivers Operators Association<br>Green Forest Arts and Craft Association<br>Lando Bibo Galas Rural Workers Association<br>Purok Kamunggay Bamboo Craft Association | Galas |
| Surf Motorcab Operators and Drivers Association | Miputak |
| Lando Bibo Barra Rural Workers Association | Barra |
| Minaog Motorcab Operators and Drivers Association<br>Minaog Rural Workers Association | Minaog |
| Gambeach Settlers Association<br>Nagkahiusang Kabus Alayon sa Maayong Ugma | Sicayab |
| Katipunan | |
| Coconut Palm Products Producers Association<br>New Tambo Babuyan Livelihood Association | New Tambo |
| San Antonio Small Fisherman Association | San Antonio |
| Manukan | |
| Manukan Craft Village Project Association | Poblacion |
| Lando Bibo Barra Punta Blanca Workers Association | Punta Blanca |
| Roxas | |
| Dohinob Coconut Farmers' Association<br>Malig-on Women's Association<br>Roxas Bottled Sardines | Dohinob |
| Lando Bibo Lower Irasan Workers' Association<br>Langhatian Lower Irasan Fishermans' Association | Lower Irasan |
| Nabilid Dockhandlers Multi-purpose Association | Nabilid |
| Manukan Craft Village Project Association | Manukan |
| Lando Bibo Barra Punta Blanca Workers Association | Punta Blanca |

## Gender Roles and Responsibilities in Fisheries Management

Knowing the extent of sharing responsibilities across gender in fisheries management requires looking at how and by whom (men and women) normal community and households tasks are being undertaken. The answers of the respondents when asked about their observations regarding who (men, women or both) are usually engaged with or involved in particular community activities seem to generally reflect the traditional gender role stereotyping. This means that more physically strenuous tasks are dominated by men, while household and nurturing tasks are associated with women. However, some variations are seen when communities are being compared wherein one is more gender fair while another is more biased. Gender fair means both the men and women shared the tasks and the tasks were not determined by sex and traditional role stereotypes.

On the whole, many respondents stated that political meetings were the domain of men (35.47%) but this was only prevalent in Manukan (45.28%) and Katipunan (36.00%). Respondents from Dipolog observed that political meetings were dominated by women

(37.25%), while in Roxas it is a shared activity (50.00%). But it is a different situation for cooperative labor which requires more physical and is therefore reported as the domain of men (71.32%) and this is true for all sites. In contrast, almost half of the respondents in all sites observed that attending school meetings and related activities is the responsibility of women (49.06%). Others said it is done by both men and women (29.43%) or only by men (21.51%). Many respondents stated that women are responsible for preparing food (43.02%) while 35% said that it is a shared activity and almost 22% pointed out to the men as usually the ones undertaking this at home. Over-all it evident that the women dominate the kitchen and are more concerned about the education of children.

Interestingly, going to church meetings and related activities involving faith is shared by both men and women (55.09%). The strong religious belief of men and women in the project sites is apparent as this was the single task that men and women were reported to be doing almost equally. Similarly, the men and women are reported to be almost equally involved in the protection and conservation of the environment (44.15%). Only 33% of the respondents said that these tasks are dominated by men, while 23% said the women are more involved in the efforts of ensuring environmental quality. From the above although women do not currently have a significant involvement in fisheries management, the task of increasing their involvement in fisheries management should not be that difficult.

**Table 23.** Extent of Involvement of Men and Women in Home and Community Activities

| Home and Community Activities | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Political meetings and activities | | | | | |
| Men | 33 (32.35) | 18 (36.00) | 24 (45.28) | 19 (31.67) | 94 (35.47) |
| Women | 38 (37.25) | 10 (20.00) | 13 (24.53) | 11 (18.33) | 72 (27.17) |
| Both | 31 (30.40) | 12 (24.00) | 16 (30.19) | 30 (50.00) | 89 (33.59) |
| No answer | - | 10 (20.00) | - | - | 10 (3.77) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| School meetings and activities | | | | | |
| Men | 30 (29.41) | 8 (16.00) | 10 (18.87) | 9 (15.00) | 57 (21.51) |
| Women | 50 (49.02) | 25 (50.00) | 29 (54.72) | 26 (43.33) | 130 (49.06) |
| Both | 22 (21.57) | 17 (34.00) | 14 (26.41) | 25 (41.67) | 78 (29.43) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Church meetings and activities | | | | | |
| Men | 23 (22.55) | 8 (16.00) | 13 (24.53) | 9 (15.00) | 53 (20.00) |
| Women | 43 (42.16) | 6 (12.00) | 10 (18.87) | 7 (11.67) | 66 (24.91) |
| Both | 36 (35.29) | 36 (72.00) | 30 (56.60) | 44 (73.33) | 146 (55.09) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Cooperative work involving manual labor | | | | | |
| Men | 69 (67.65) | 35 (70.00) | 41 (77.36) | 44 (73.33) | 189 (71.32) |
| Women | 20 (19.60) | 2 (4.00) | 3 (5.66) | 2 (3.33) | 27 (10.19) |
| Both | 13 (12.75) | 13 (26.00) | 9 (16.98) | 13 (21.67) | 48 (18.11) |
| No answer | - | - | - | 1 (1.67) | 1 (0.38) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Preparing food for group work | | | | | |
| Men | 30 (29.41) | 8 (16.00) | 9 (16.98) | 10 (16.67) | 57 (21.51) |
| Women | 46 (45.10) | 22 (44.00) | 22 (41.51) | 24 (40.00) | 114 (43.02) |
| Both | 26 (25.49) | 20 (40.00) | 22 (41.51) | 26 (43.33) | 94 (35.47) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

| Home and Community Activities | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Protecting and conserving the environment | | | | | |
| Men | 48 (47.06) | 13 (26.00) | 14 (26.42) | 13 (21.67) | 88 (33.21) |
| Women | 25 (24.51) | 11 (22.00) | 12 (22.64) | 12 (20.00) | 60 (22.64) |
| Both | 29 (28.43) | 26 (52.00) | 27 (50.94) | 35 (58.33) | 117 (44.15) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

## Involvement of Women and Children in Fishery Activities

A quick review of secondary data shows that the number of women who are 100% involved in fishery activities is extremely few. Their involvement is measured by the estimated amount of time they spent for a particular activity in a specific episode of the whole fishing complex. For example, up to 20% means up to one fifth of their time at their disposal in one day is spent for a particular activity. In other words, they may be involved in various activities, but with a lesser percentage of time spent per activity. The episodes in fishing complex can be classified as pre-fishing (e.g., preparation of food, money to spend and other needs), actual fishing (e.g., throwing and pulling the net, paddling the boat) and post-fishing (e.g., hauling the catch, cleaning, vending, processing). There are overlaps in activities the women were involved with based on the number of households reporting which may explain why the total time appropriated or spent for is more than 100%.

The involvement of women may be higher during pre- and post-fishing but not in actual fishing because of their other domestic responsibilities. Some may be involved only in nearshore fishing like in beach seining *(panahid)*. The data show that the women in households surveyed are generally involved in actual fishing up to 40% of their time, except in Roxas where a few were observed to have reached up to 80%. It is also only in Roxas where there are more women who spent between 80% to 100% of their time in post-fishing activities compared in other sites where their involvement ranged between 40% to 60% of their time. Generally, it can be said that while women assumed a certain degree of roles in pre- and post-harvesting activities they have not really contributed to the labor needed in the fishing industry. And they can be more involved and productive if they can be provided with enough fish processing skills, so that they could produce value added products rather than just selling them directly to middle buyers.

**Table 24.** Extent of Involvement of Women in Fishery Activities

| Fishery Activities | Municipa-lities | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| Catching fish | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 35 (70.00) | 15 (30.00) | - | - | - | 50 (100.00) |
| | Manukan | 21 (39.62) | 32 (60.38) | - | - | - | 53 (100.00) |
| | Roxas | - | 14 (23.33) | 44 (73.34) | 2 (3.33) | - | 60 (100.00) |
| Unmeshing the net | Dipolog | 41 (40.20) | 61 (59.80) | - | - | - | 102 (100.00) |
| | Katipunan | 35 (70.00) | 15 (30.00) | - | - | - | 50 (100.00) |
| | Manukan | - | 19 (35.85) | 31 (58.49) | 3 (5.66) | - | 53 (100.00) |
| | Roxas | - | 14 (23.33) | 38 (63.33) | 8 (13.33) | - | 60 (100.00) |
| Unhooking fish from Hook | Dipolog | 41 (40.20) | 61 (59.80) | - | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 40 (80.00) | - | - | - | 50 (100.00) |
| | Manukan | 24 (45.28) | 21 (39.62) | 8 (15.09) | - | - | 53 (100.00) |
| | Roxas | - | 3 (5.00) | 48 (80.00) | 9 (15.00) | - | 60 (100.00) |

| Fishery Activities | Municipa-lities | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| Hauling fish from boat to Coastline | Dipolog | 20 (19.61) | 72 (70.59) | 10 (9.80) | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 35 (70.00) | 5 (10.00) | - | - | 50 (100.00) |
| | Manukan | - | 47 (88.68) | 6 (11.32) | - | - | 53 (100.00) |
| | Roxas | - | 5 (8.33) | 14 (23.33) | 41 (68.33) | - | 60 (100.00) |
| Vending fish | Dipolog | - | 43 (42.16) | 57 (55.88) | 2 (1.96) | - | 102 (100.00) |
| | Katipunan | - | 40 (80.00) | 10 (20.00) | - | - | 50 (100.00) |
| | Manukan | - | 16 (30.19) | 37 (69.81) | - | - | 53 (100.00) |
| | Roxas | - | - | 10 (16.67) | 40 (66.67) | 10 (16.67) | 60 (100.00) |
| Drying up the Fish | Dipolog | - | 82 (80.39) | 20 (19.61) | - | - | 102 (100.00) |
| | Katipunan | - | 35 (70.00) | 15 (30.00) | - | - | 50 (100.00) |
| | Manukan | - | 21 (39.62) | 32 (60.38) | - | - | 53 (100.00) |
| | Roxas | - | - | 48 (80.00) | 12 (20.00) | - | 60 (100.00) |
| Salting the Fish | Dipolog | - | 43 (42.16) | 57 (55.88) | 2 (1.96) | - | 102 (100.00) |
| | Katipunan | - | 10 (20.00) | 40 (80.00) | - | - | 50 (100.00) |
| | Manukan | - | 12 (22.64) | 39 (73.58) | 2 (3.77) | - | 53 (100.00) |
| | Roxas | - | 10 (16.67) | 40 (66.67) | 10 (16.67) | - | 60 (100.00) |
| Smoking the Fish | Dipolog | - | 82 (80.39) | 20 (19.61) | - | - | 102 (100.00) |
| | Katipunan | 25 (50.00) | 25 (50.00) | - | - | - | 50 (100.00) |
| | Manukan | 3 (5.66) | 40 (75.47) | 10 (18.87) | - | - | 53 (100.00) |
| | Roxas | 5 (8.33) | 26 (43.33) | 29 (48.33) | - | - | 60 (100.00) |
| Weighing the Fish | Dipolog | - | 51 (50.00) | 51 (50.00) | - | - | 102 (100.00) |
| | Katipunan | - | 10 (20.00) | 40 (80.00) | - | - | 50 (100.00) |
| | Manukan | - | 8 (15.09) | 31 (58.49) | 14 (26.42) | - | 53 (100.00) |
| | Roxas | - | 12 (20.00) | 48 (80.00) | - | - | 60 (100.00) |
| Making sardines | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 9 (16.98) | 43 (81.13) | 1 (1.89) | - | - | 53 (100.00) |
| | Roxas | - | 10 (16.67) | 40 (66.67) | 10 (16.67) | - | 60 (100.00) |
| Counting the fish in | Dipolog | - | 9 (8.82) | 84 (82.35) | 9 (8.82) | - | 102 (100.00) |
| | Katipunan | - | 30 (60.00) | 20 (40.00) | - | - | 50 (100.00) |
| | Manukan | - | 5 (9.43) | 48 (90.57) | - | - | 53 (100.00) |
| | Roxas | - | - | 10 (16.67) | 22 (36.67) | 28 (46.67) | 60 (100.00) |
| Buying fish to be sold | Dipolog | 21 (20.59) | 81 (79.41) | - | - | - | 102 (100.00) |
| | Katipunan | - | 45 (90.00) | 5 (10.00) | - | - | 50 (100.00) |
| | Manukan | - | 14 (26.42) | 39 (73.59) | - | - | 53 (100.00) |
| | Roxas | - | - | 17 (28.33) | 43 (81.13) | - | 60 (100.00) |
| Preparing food for the fishers | Dipolog | - | - | 82 (80.39) | 20 (19.61) | - | 102 (100.00) |
| | Katipunan | - | - | 30 (60.00) | 20 (40.00) | - | 50 (100.00) |
| | Manukan | - | - | 40 (75.47) | 13 (24.53) | - | 53 (100.00) |
| | Roxas | - | - | 6 (10.00) | 54 (90.00) | - | 60 (100.00) |
| Repairing the net | Dipolog | 41 (40.20) | 61 (59.80) | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 24 (45.28) | 29 (54.72) | - | - | - | 53 (100.00) |
| | Roxas | - | 18 (30.00) | 42 (70.00) | - | - | 60 (100.00) |
| Repairing the boat | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 24 (45.28) | 29 (54.72) | - | - | - | 53 (100.00) |
| | Roxas | - | 18 (30.00) | 42 (70.00) | - | - | 60 (100.00) |
| Hanging the net | Dipolog | 92 (90.20) | 10 (9.80) | - | - | - | 102 (100.00) |
| | Katipunan | - | 45 (90.00) | 5 (10.00) | - | - | 50 (100.00) |
| | Manukan | 2 (3.77) | 46 (86.79) | 5 (9.43) | - | - | 53 (100.00) |
| | Roxas | - | - | 24 (40.00) | 36 (60.00) | - | 60 (100.00) |
| Placing the | Dipolog | 82 (80.39) | 20 (19.61) | - | - | - | 102 (100.00) |

| Fishery Activities | Municipa-lities | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| net on the boat | Katipunan | 15 (14.71) | 35 (70.00) | - | - | - | 50 (100.00) |
| | Manukan | 2 (1.96) | 46 (86.79) | 5 (9.43) | - | - | 53 (100.00) |
| | Roxas | - | - | 24 (40.00) | 36 (60.00) | - | 60 (100.00) |
| Making arrangement with middle traders | Dipolog | - | 10 (9.80) | 92 (90.20) | - | - | 102 (100.00) |
| | Katipunan | - | 10 (20.00) | 30 (60.00) | 10 (20.00) | - | 50 (100.00) |
| | Manukan | - | - | 45 (84.91) | 8 (15.09) | - | 53 (100.00) |
| | Roxas | - | - | 30 (50.00) | 30 (50.00) | - | 60 (100.00) |
| Preparing the containers for the catch | Dipolog | - | 10 (9.80) | 92 (90.20) | - | - | 102 (100.00) |
| | Katipunan | - | 20 (40.00) | 30 (60.00) | - | - | 50 (100.00) |
| | Manukan | - | 14 (26.42) | 39 (73.59) | - | - | 53 (100.00) |
| | Roxas | - | - | 6 (10.00) | 54 (90.00) | - | 60 (100.00) |
| Borrowing money | Dipolog | - | 20 (19.61) | 82 (80.39) | - | - | 102 (100.00) |
| | Katipunan | - | 10 (18.87) | 30 (29.41) | 10 (20.00) | - | 50 (100.00) |
| | Manukan | - | - | 31 (58.49) | 17 (32.08) | 5 (9.43) | 53 (100.00) |
| | Roxas | - | - | 48 (80.00) | 12 (20.00) | - | 60 (100.00) |

Like in the case of women there are also overlaps in activities the children were reportedly involved with and this may explain why the total time appropriated or spent for is more than 100%. The majority of the households surveyed have children who are involved up to only 40% of their spare time which is expected because they are just children who are not to be fully involved in productive activities, except to provide support or assistance to the household labor force. Although no data are available about the ages of children who are involved in fishery activities, it is presumed that older children are more involved than the younger ones. It is in Roxas which shows children involved in various fishery activities that majority have done it up to 80% of their time. More so, it is here that 10% of the children have engaged in actual catching of fish, mostly like involving the sons.

So what the data show have to be interpreted according to gender role stereotype. More strenuous tasks are likely to be done by boys rather than girls in the family. Furthermore, the boys and girls are involved in fishery activities along with their fathers and mothers, respectively. This is also where gender role socialization is taking place. For instance, the percentages that show that children are involved up to 20% of their time in borrowing money to spend for fishing trips must be referring more to the girl children. Meanwhile, the involvement of children in the counting of the fish, associated with hauling, must have been more observed or associated with the male children because this is more of a male task.

**Table 25.** Extent of Involvement of Children in Fishery Activities

| Practices | Municipa-lities | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| Catching fish | Dipolog | 10 (9.80) | 92 (90.20) | - | - | - | 102 (100.00) |
| | Katipunan | 5 (10.00) | 45 (90.00) | - | - | - | 50 (100.00) |
| | Manukan | - | 47 (88.68) | 6 (11.32) | - | - | 53 (100.00) |
| | Roxas | - | - | 54 (90.00) | 6 (10.00) | - | 60 (100.00) |
| Unmeshing from the net | Dipolog | 8 (7.84) | 86 (84.32) | 8 (7.84) | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 30 (60.00) | 10 (20.00) | - | - | 50 (100.00) |
| | Manukan | - | 38 (71.70) | 9 (16.98) | 6 (11.32) | - | 53 (100.00) |
| | Roxas | - | 6 (10.00) | 28 (46.67) | 26 (43.33) | - | 60 (100.00) |
| Unhooking fish from the hook | Dipolog | 10 (9.80) | 92 (90.20) | - | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 30 (60.00) | 10 (20.00) | - | - | 50 (100.00) |

| Practices | Municipa-lities | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| | Manukan | 11 (20.76) | 31 (58.48) | 11 (20.76) | - | - | 53 (100.00) |
| | Roxas | - | - | 18 (30.00) | 42 (70.00) | - | 60 (100.00) |
| Hauling fish from the boat to the coastline | Dipolog | 10 (98.80) | 92 (90.20) | - | - | - | 102 (100.00) |
| | Katipunan | - | 40 (80.00) | 10 (20.00) | - | - | 50 (100.00) |
| | Manukan | - | 38 (71.70) | 9 (16.98) | 6 (11.32) | - | 53 (100.00) |
| | Roxas | - | - | 18 (30.00) | 42 (70.00) | - | 60 (100.00) |
| Vending the fish | Dipolog | 31 (30.39) | 71 (69.61) | - | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 40 (80.00) | - | - | - | 50 (100.00) |
| | Manukan | 16 (30.19) | 27 (50.94) | 10 (20.00) | - | - | 53 (100.00) |
| | Roxas | - | - | 6 (10.00) | 54 (90.00) | - | 60 (100.00) |
| Drying up the fish | Dipolog | 51 (50.00) | 51 (50.00) | - | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 40 (80.00) | - | - | - | 50 (100.00) |
| | Manukan | - | 37 (69.81) | 16 (30.19) | - | - | 53 (100.00) |
| | Roxas | - | - | 54 (90.00) | 6 (100.00) | - | 60 (100.00) |
| Salting the fish | Dipolog | 41 (40.20) | 61 (59.80) | - | - | - | 102 (100.00) |
| | Katipunan | 20 (40.00) | 30 (60.00) | - | - | - | 50 (100.00) |
| | Manukan | 16 (30.19) | 27 (50.94) | 10 (18.87) | - | - | 53 (100.00) |
| | Roxas | - | - | 6 (10.00) | 54 (90.00) | - | 60 (100.00) |
| Smoking the fish | Dipolog | 10 (9.80) | 92 (90.20) | - | - | - | 102 (100.00) |
| | Katipunan | 20 (40.00) | 30 (60.00) | - | - | - | 50 (100.00) |
| | Manukan | 11 (20.75) | 42 (79.25) | - | - | - | 53 (100.00) |
| | Roxas | - | 30 (50.00) | 30 (50.00) | - | - | 60 (100.00) |
| Weighing the fish | Dipolog | 51 (50.00) | 51 (50.00) | - | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 40 (80.00) | - | - | - | 50 (100.00) |
| | Manukan | 16 (30.19) | 27 (50.94) | 10 (18.87) | - | - | 53 (100.00) |
| | Roxas | - | - | 12 (20.00) | 48 (80.00) | - | 60 (100.00) |
| Making sardines | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 32 (60.38) | 21 (39.62) | - | - | - | 53 (100.00) |
| | Roxas | - | 12 (20.00) | 48 (80.00) | - | - | 60 (100.00) |
| Counting the fish in | Dipolog | 18 (17.65) | 56 (54.90) | 28 (27.45) | - | - | 102 (100.00) |
| | Katipunan | 40 (80.00) | 10 (20.00) | - | - | - | 50 (100.00) |
| | Manukan | 16 (30.19) | 37 (69.81) | - | - | - | 53 (100.00) |
| | Roxas | - | - | - | 36 (60.00) | 24 (40.00) | 60 (100.00) |
| Buying fish to be sold | Dipolog | 10 (9.80) | 92 (90.20) | - | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 40 (80.00) | - | - | - | 50 (100.00) |
| | Manukan | 11 (20.75) | 42 (79.25) | - | - | - | 53 (100.00) |
| | Roxas | - | 6 (10.00) | 28 (46.67) | 26 (43.33) | - | 60 (100.00) |
| Preparing food for the fisher | Dipolog | 41 (40.20) | 61 (59.80) | - | - | - | 102 (100.00) |
| | Katipunan | 15 (30.00) | 35 (70.00) | - | - | - | 50 (100.00) |
| | Manukan | 16 (30.19) | 27 (50.94) | 10 (52.63) | - | - | 53 (100.00) |
| | Roxas | - | - | 12 (20.00) | 48 (80.00) | - | 60 (100.00) |
| Repairing the net | Dipolog | 71 (69.61) | 31 (30.39) | - | - | - | 102 (100.00) |
| | Katipunan | 30 (60.00) | 20 (40.00) | - | - | - | 50 (100.00) |
| | Manukan | 13 (24.53) | 37 (69.81) | 3 (5.66) | - | - | 53 (100.00) |
| | Roxas | - | - | 42 (70.00) | 18 (30.00) | - | 60 (100.00) |
| Repairing the boat | Dipolog | 92 (90.20) | 10 (9.80) | - | - | - | 102 (100.00) |
| | Katipunan | 30 (60.00) | 20 (40.00) | - | - | - | 50 (100.00) |
| | Manukan | - | 48 (90.57) | 5 (9.43) | - | - | 53 (100.00) |
| | Roxas | - | - | 48 (80.00) | 12 (20.00) | - | 60 (100.00) |
| Hanging the net | Dipolog | 41 (40.20) | 61 (59.80) | - | - | - | 102 (100.00) |
| | Katipunan | 15 (30.00) | 35 (70.00) | - | - | - | 50 (100.00) |
| | Manukan | 16 (30.19) | 27 (50.94) | 10 (18.87) | - | - | 53 (100.00) |
| | Roxas | - | - | 12 (20.00) | 48 (80.00) | - | 60 (100.00) |

| Practices | Municipa-lities | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| Placing the net on the boat | Dipolog | 41 (40.20) | 61 (59.80) | - | - | - | 102 (100.00) |
| | Katipunan | 25 (50.00) | 25 (50.00) | - | - | - | 50 (100.00) |
| | Manukan | 19 (35.85) | 26 (49.06) | 8 (15.09) | - | - | 53 (100.00) |
| | Roxas | - | - | 12 (20.00) | 48 (80.00) | - | 60 (100.00) |
| Making arrangement with middle traders | Dipolog | 92 (90.20) | 10 (9.80) | - | - | - | 102 (100.00) |
| | Katipunan | 45 (90.00) | 5 (4.90) | - | - | - | 50 (100.00) |
| | Manukan | 16 (30.19) | 27 (50.94) | 10 (18.87) | - | - | 53 (100.00) |
| | Roxas | - | 4 (6.67) | 40 (66.67) | 16 (26.66) | - | 60 (100.00) |
| Preparing the containers for the catch | Dipolog | 4 (3.92) | 74 (72.55) | 24 (23.53) | - | - | 102 (100.00) |
| | Katipunan | 10 (20.00) | 40 (80.00) | - | - | - | 50 (100.00) |
| | Manukan | - | 32 (60.38) | 21 (39.62) | - | - | 53 (100.00) |
| | Roxas | - | - | 48 (80.00) | 12 (20.00) | - | 60 (100.00) |
| Borrowing money | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 45 (90.00) | 5 (10.00) | - | - | - | 50 (100.00) |
| | Manukan | 32 (60.38) | 21 (39.62) | - | - | - | 53 (100.00) |
| | Roxas | - | - | 14 (23.33) | 38 (63.34) | 8 (13.33) | 60 (100.00) |

## Understanding of Co-Management Concept

***Perceptions of shared responsibilities.*** Co-management of fishery resources generally means sharing of responsibilities in performing tasks to sustainably manage fisheries resources. It means that resource management that starts from generating information and planning to implementation and compliance or participation in programs is not the sole responsibility of those in the government, but must be shared among various types of stakeholders in the community and particularly the fishers. To see if resource co-management exists or the possibility of its being practiced is high in the communities surveyed, the respondents were asked to say whom they perceived are responsible for certain management functions. For analytical purposes, the choices are classified as government agencies, fishers' associations, combination of government agencies and fishers' associations, and government and fishers with the participation of women's groups.

The results show that the government is perceived by majority of the respondents to be responsible in undertaking most of the management functions which could have been shared according to specific, but related tasks. The management functions that respondents from Dipolog and Katipunan were primarily the role of the government included formulation of policies and others, enforcement of laws and regulations, study of the conditions and problems of fishery resources, monitoring and assessment of fishery resources, and dissemination of information about these matters. The majority of the respondents from Manukan and Roxas also shared such perceptions except they thought that the monitoring and assessing of the status of fishery resources should be a shared responsibility between the government, fishing households and fisher organizations.

Meanwhile, majority of the respondents in all the sites perceived that compliance of fishery laws and regulations to be a major task of the in the fishery sector. But it is interesting to note that the majority (66.67%) in Dipolog and a significant number of the respondents in Manukan (37.74%) considered that planning in the management of fishery resources should be a joint task of the government, the fishery sector and women's groups in the community. In contrast, a quite a lot of respondents from Katipunan (38.00%) and Roxas (38.33%) perceived this to be a joint task of only the government and fishers. Nonetheless, the data

show that there is a growing understanding that co-management of fishery resources is vital and this perception needs to be capitalized on to promote multi-stakeholder resource management.

**Table 26.** Groups Perceived as Responsible for Particular Tasks in Fisheries Management

| Co-Management Functions and Expectations | Dipolog | | | | Katipunan | | | |
|---|---|---|---|---|---|---|---|---|
| | G | F | GF | GFW | G | F | GF | GFW |
| Formulation of policies, laws and regulations to manage fisheries | 97 (95.10) | - | 5 (4.90) | - | 44 (88.00) | 2 (4.00) | 4 (8.00) | - |
| Enforcement of fishery laws and regulations | 92 (90.20) | - | 8 (7.84) | 2 (1.96) | 44 (88.00) | - | 5 (10.00) | 1 (2.00) |
| Compliance of fishery laws and regulations | 2 (1.96) | 90 (88.24) | 8 (7.84) | 2 (1.96) | 4 (8.00) | 39 (78.00) | 6 (12.00) | 1 (2.00) |
| Study of the conditions and problems of fishery resources | 90 (88.23) | 2 (1.96) | 10 (9.80) | - | 39 (78.00) | 1 (2.00) | 10 (20.00) | - |
| Monitoring and assessing the status of fishery resources | 92 (90.20) | - | 8 (7.84) | 2 (1.96) | 34 (68.00) | - | 14 (28.00) | 2 (4.00) |
| Planning in the management of fishery resources | 8 (7.84) | 18 (17.65) | 8 (7.84) | 68 (66.67) | 13 (26.00) | 9 (18.00) | 19 (38.00) | 9 (18.00) |
| Dissemination of information about matters related to fisheries | 80 (78.43) | 4 (3.92) | 10 (9.80) | 8 (7.84) | 41 (82.00) | 2 (4.00) | 5 (10.00) | 2 (4.00) |
| Formulation of policies, laws and regulations to manage fisheries | 49 (92.45) | | 4 (7.55) | - | 55 (91.67) | | 5 (8.33) | - |
| Enforcement of fishery laws and regulations | 36 (67.93) | 2 (3.77) | 15 (28.30) | 2 (3.77) | 47 (78.33) | - | 12 (20.00) | 1 (1.67) |
| Compliance of fishery laws and regulations | - | 50 (94.34) | 3 (5.66) | - | - | 56 (93.33) | 4 (6.67) | - |
| Study of the conditions and problems of fishery resources | 40 (75.47) | 1 (1.89) | 12 (22.64) | - | 46 (76.67) | 1 (1.67) | 13 (21.66) | - |
| Monitoring and assessing the status of fishery resources | 23 (43.40) | - | 28 (52.83) | 2 (3.77) | 27 (45.00) | - | 31 (51.67) | 2 (3.33) |
| Planning in the management of fishery resources | 14 (26.41) | 1 (1.89) | 18 (33.96) | 20 (37.74) | 16 (26.67) | 1 (1.67) | 23 (38.33) | 20 (33.33) |
| Dissemination of information about matters related to fisheries | 33 (62.26) | 6 (11.32) | 14 (26.42) | - | 49 (81.66) | 3 (5.00) | 7 (11.67) | 1 (1.67) |

Legend: G = Government, F = Fishers, GF = Government and Fishers; GFW = Government, Fishers and Women

***Emerging co-management issues.*** Respondents have a diverse understanding of the concept of utilization and regulation of fishery resources and what management regimes should be adopted. Only in Katipunan did the majority prefere co-management (66.00%), while a significant number of respondents from Dipolog (43.14%) also preferred co-management. Meanwhile, significant percentages from Manukan (45.28%) and Roxas (45.00%) preferred open-access and centralized management regimes, respectively. Taken as a whole, 45% agreed that some form of co-management of fishery resources is okay in their respective communities, while 28.30% wanted a centralized regime and 26.79% open-access regime.

Understandably, almost half of all the respondents (49.43%) believe that conflict around fishery resources should be resolved amicably in the community by local leaders, which suggests that the respondents appreciate the involvement of the local community in dealing with matters that involve their own resources. This response is corroborated by a significant number of all respondents (37.36%) who said that the local government strongly enforces regulations with the active participation of fishers. However about 31% of respondents insist that there is no active participation of fishers in enforcement efforts. In complete contrast, a few (18.11%) said that there is no support from the government in the enforcement which only enforced by the fishers themselves. But it can be further argued that

there is a willingness to really involve the community, like in seeking interventions of local leaders by aggrieved parties in conflict resulting from the use of fishery resources, as observed by 59% of all the respondents.

**Table 27.** Co-Management Issues

| Co-Management Issues | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Concept on Fishery Resource Management | | | | | |
| Open-access regime | 26 (25.49) | 11 (22.00) | 24 (45.28) | 10 (16.67) | 71 (26.79) |
| Centralized regime | 32 (31.37) | 6 (12.00) | 10 (18.87) | 27 (45.00) | 75 (28.30) |
| Co-management regime | 44 (43.14) | 33 (66.00) | 19 (35.85) | 23 (38.33) | 119 (44.91) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Conflict Around Fishery Resources | | | | | |
| Will just die out as time passes by without settling mechanism | 31 (30.39) | 19 (38.00) | 18 (33.96) | 8 (13.33) | 76 (28.68) |
| Should be resolved amicably in the community by local leaders | 49 (48.04) | 25 (50.00) | 29 (54.72) | 28(46.67) | 131(49.43) |
| Should be brought to court and resolved according to provisions of the law | 22 (21.57) | 6 (12.00) | 6 (11.32) | 24 (40.00) | 58 (21.89) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Description on the Current Management of Fishery Resources | | | | | |
| No existing regulations enforced in the use of fishery resources | 25 (24.51) | 7 (14.00) | 2 (3.77) | 2 (3.33) | 36 (13.59) |
| Local government strongly enforces regulations without fishers' participation | 26 (25.49) | 6 (12.00) | 28 (52.83) | 22 (36.67) | 82 (30.94) |
| Local government strongly enforces regulations with fishers' active participation | 30 (29.41) | 25 (50.00) | 23 (43.40) | 21 (35.00) | 99 (37.36) |
| Only fishers strongly enforced regulations without local government support | 21 (20.59) | 12 (24.00) | - | 15(25.00) | 48 (18.11) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Ways in Resolving Conflicts Resulting from the Use of Fishery Resources | | | | | |
| Nothing is being done to resolve the conflict | 38 (37.25) | 12 (24.00) | 10 (18.87) | 19 (31.67) | 79 (29.81) |
| Aggrieved parties usually seek intervention of local leaders | 41 (40.20) | 32 (64.00) | 42 (79.24) | 41 (68.33) | 156 (58.87) |
| Aggrieved parties usually go to court and file cases | 23 (22.55) | 6 (12.00) | 1 (1.89) | - | 30 (11.32) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

## Summary

The Local Government Code of 1991 (RA 7160) and the Philippine Fisheries Code of 1998 (RA 8550) are two national laws that provide the basis for the local government units to develop policies and regulations that promote co-management regime. The Local Government Code devolves the function of the national government to the local government units, which include the management of environmental resources within their jurisdictions. The Fisheries Code specifically allows local government units to have power over municipal waters and to assume the lead role in protecting fisheries and aquatic resources found therein. It also provides the mechanics by which multi-sectoral participation can be mobilized for this by making the formation of FARMCs possible. The creation of environmental non-government and people's organizations is encouraged to enhance co-management regime.

There are number of peoples' organization in the study sites though most of these are composed of marginal community groups, including particularly small-scale inshore fishers. The presence of these organizations provides a reserve of human capital for more sustainable management of Dipolog Bay resources if properly motivated and harnessed. At the

community level, the traditional distinction of gender roles prevail where more strenuous tasks that require physical force are dominated by men, while nurturing or domestic tasks and those concerning the welfare of children are the domain of women. But what is interesting to highlight is the fact that protecting and conserving the environment is a shared responsibility of both men and women, which suggests the feasibility of involving bothe men and women in co-management. However, in fishing-related activities women are predominately only involved in pre- and post-fishing activities because going to sea to fish is physically strenuous and requires long periods away from the home. This is the domain of men and also usually involves sons in fishing-related tasks. Meanwhile, the daughters are more involved in tasks that are stereotyped to be the domains of mothers.

The government is seen to be responsible for various fisheries management functions except with compliance of fishery laws and regulations which is generally expected to be the role only of fishers. Nevertheless, the planning in the management of fishery resources is perceived to be a joint task of the government, the fishery sector as well as the women's groups in the community particularly by Dipolog and Manukan respondents. But in Katipunan and Roxas this is perceived as only a joint task of the government and the fishers.

In general, there is no doubt that a feeling of co-management regime is prevalent among a significant number of respondents at the study sites. They expressed that community leaders should help in resolving conflicts over fishery resources, although the government is still seen as the one strongly enforcing the laws over fishery resources. The active involvement of the fishers and of community leaders in resource management further signifies the subtle presence of co-management regime. This is noticed on their observations by the majority of the respondents that the aggrieved parties over the use of fishery resources usually seek intervention of local leaders, while seeing that the government has still stronger role over management matter of fishery resources because of its legal mandate.

# Chapter V

# SEA SAFETY AND VULNERABILITY REDUCTION

Making a living particularly in coastal communities is not separate from ensuring safety and avoiding disasters and accidents while out fishing in the sea. The state and its constituencies are becoming conscious of preventing the loss of lives, but the financial resources to spend for this are often causing problems to fully implement what the law requires. This chapter examines the legal framework, the perceptions of people about sea safety, safety practices, preparation against disasters and assessment of early warning devices, avoidance of and recovery from accidents or vulnerability reduction and understanding about climate change. The ultimate aim is to show that there are institutional, community and personal levels of working for sea safety and in saving lives not only caused by poverty, but also from accidents and natural disasters.

## Perceptions on Sea Safety and Accidents

It is heart-warming to note that a significant percentage of the respondents (46.04%) from all sites perceived that the incidences of sea accidents in their respective communities are fewer during the past 12 months prior to conduct of the survey compared to five years ago. Possible reasons for this can be due to safety measures adopted by fisher households themselves or those being implemented by local government units to ensure that the loss of lives or the cost of medication and hospitalization of poor victims of sea accidents is minimized. It is only among Dipology respondents that a significant percentage believed that the same number of sea accidents had occurred over time but it is difficult to ascertain whether the incidences were greater or lesser because of the absence of hard data. Meanwhile, about 38% of the Manukan respondents perceived that more sea accidents had occurred during the past 12 months compared to five years ago.

**Table 28.** Perceptions on Incidence of Sea Accidents Among Fishers in the Past 12 Months Compared Five Years Ago

| Perceived Incidence of Sea Accidents | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (% | Total (%) |
|---|---|---|---|---|---|
| Fewer number of sea accidents during the past 12 month compared five years ago | 34 (33.33) | 18 (36.00) | 21 (39.62) | 49 (81.67) | 122 (46.04) |
| Same number of sea accidents during the past 12 months compared five years ago | 48 (47.06) | 14 (28.00) | 12 (22.64) | 4 (6.67) | 78 (29.43) |
| Greater number of sea accidents during the past 12 months compared five years ago | 10 (9.80) | 8 (16.00) | 20 (37.74) | 2 (3.33) | 40 (15.09) |
| No answer | 10 (9.80) | 10 (20.00) | - | 5 (8.33) | 25 (9.43) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

## Safety Measures at Sea

While it is the mandate of the state to ensure the safety of fishers at sea as well as travellers, by promulgating laws and policies and providing logistical support to enforce and implement them, it is expected that each individual, group and community has to do their respective role to support this effort. There is also the need for government officials to exercise political will to enforce what safety measures are provided by law and to support what initiatives the private individuals and groups have started to ensure safer measures at sea and particularly for poor fishers.

The foremost safety measures at sea identified by respondents are precautionary in nature. This means that they help fishers decide whether to make a fishing trip or not knowing that the chances of going into trouble is higher if an incoming typhoon is predicted or their boat engine is in poor condition. Ninety-two percent admitted that they check the weather report before every fishing trip to ensure that they can avoid danger. This is the foremost on the list of respondent safety measures from all sites and this was ranked highest for Dipolog (96.08%) respondents. Second on their list, except for Manukan respondents, is having radio or communication equipment in the fishing boat (87.55%) so they can easily ask for assistance when any unexpected event happens at sea. The respondents from Manukan considered checking the condition of their boat engine as the second most important safety measure (79.25%) which is, incidentally, third on over-all list from all sites (78.11%).

Other preventative safety measures include taking safety equipment like life jackets and life buoy (59.24%) as well as a first aid kit (42.26%) to sea and knowing about toxic marine species. The need to have safety equipment is more pronounced in the list of Roxas respondents (95.00%), Manukan (71.70%) and Katipunan (70.00%). Manukan respondents prioritized the importance of identifying toxic marine species, more than other respondents. Generally, any external effort to assist fishing households to fish more safely, should consider what they are currently doing and what can be done to make them safer.

**Table 29**. Knowledge and Practices on Safety at Sea When Fishing

| Safety Measures | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Checking weather report every fishing trip | 98 (96.08) | 45 (90.00) | 45 (84.91) | 57 (95.00) | 245 (92.45) |
| Having radio or communication equipment in the fishing boat | 91 (89.22) | 44 (88.00) | 40 (75.47) | 57 (95.00) | 232 (87.55) |
| Checking the condition of the fishing boat engine | 78 (76.47) | 30 (60.000 | 42 (79.25) | 57 (95.00) | 207 (78.11) |
| Taking safety equipment every fishing trip (e.g. life jacket, life buoy) | 27 (26.47) | 35 (70.00) | 38 (71.70) | 57 (95.00) | 157 (59.24) |
| Taking a first aid kit every fishing trip | 23 (22.55) | 2 (4.00) | 30 (56.60) | 57 (95.00) | 112 (42.26) |
| Learning the toxicity of marine species | 15 (14.71) | - | 19 (35.85) | 2 (3.33) | 36 (13.58) |

Multiple Responses

## Preparations for Disasters

Preparations to prevent major damage brought about by natural disasters or calamities can take place at the household, the community and government levels. Because it is of immediate concern and a priority which does not require a group decision, it is expected that more preparations may be observed at the household level. It is human natures that personal and family safety and security comes first, before thinking of other community members. But there are also personal and family concerns that are dependent upon how the local government unit or the community work together to address matters that will affect the entire communities.

Although general trends can be noted on the preparations of the households to avoid disasters, there are actually variations among the different study sites. The majority (50.51%) considered moving to elevated areas at times when a typhoon strikes to avoid the likelihood drowing during associated flooding. This is particularly foremost in the responses of those surveyed in Katipunan (90.00%) and Manukan (86.79%). Meanwhile, foremost in the preparations of Dipolog respondents is getting involved in community earthquake and fire drills (39.22%) and storing enough food for the Roxas respondents (30.00%). Both preparations are actually second and third on the list of all the respondents.

**Table 30.** Preparations of Households to Disasters

| Preparations for Disasters and Calamities | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Moving to elevated areas at times when typhoon occurs | 36 (35.29) | 45 (90.00) | 46 (86.79) | 7 (11.67) | 134 (50.57) |
| Storing enough food to avoid going out from house during the typhoon. | 35 (34.31) | 21 (42.00) | 41 (77.36) | 18 (30.00) | 115 (43.40) |
| Conducting community earthquake and fire drills | 40 (39.22) | 40 (80.00) | 31 (58.49) | 3 (5.00) | 114 (43.02) |
| Storing kerosene lamps, candles, flashlights, matches and other emergency source of lights. | 12 (11.76) | - | 41 (77.36) | 16 (26.67) | 69 (26.04) |
| Anchoring house pillars to strong and big trees nearby to keep it in place during very high tides and strong wind | 15 (14.71) | 3 (6.00) | 36 (67.92) | 6 (10.00) | 60 (22.64) |
| Fixing the parts of the house that need repair before the storm comes to avoid accident | 5 (4.90) | 13 (26.00) | 37 (69.81) | 5 (8.33) | 60 (22.64) |
| Conducting regular community meeting pertaining to the disaster preparedness | 10 (9.80) | - | 30 (56.60) | 2 (3.33) | 42 (15.85) |
| Organizing community search and rescue team involving volunteers | 5 (4.90) | 5 (10.00) | 10 (18.87) | 1 (1.67) | 21 (7.92) |
| Identifying evacuation centres to easily move affected people and households of disasters | - | 11 (22.00) | 5 (9.43) | 1 (1.67) | 17 (6.42) |

## Early Warning Devices

Public announcements about forthcoming typhoons and other natural calamities, are broadcast by telephone, mobile phone, postal services and broadcast media, help to reduce loss of lives and property damage because people are forewarned to evacuate to safer areas or to prepare for any untoward events. But the ability of these early warning devices to forewarn people varies. The respondents were presented with a list of early warning devices and were asked to rank the extent to which the devises had alerted them about incoming disasters.

These include personally-owned cell phones, radios and televisions and community warning systems such as sirens, bells, megaphones, public audio systems and village couriers.

By computing the average rating per warning device, the majority of respondents (73.00%) only ranked sirens, bells, megaphones and public audio systems 20% able to alert the community about forthcoming disasters. Roxas respondents were unique however and ranked the ability of sirens (98.33%) and bells (83.33%) up to 80% of the time while the public audio system (91.67%) and megaphone (90.00%) up to 60% of the time. But majority of the respondents (68.16%) from all the surveyed sites agreed that the cell phone (74.64%) and radio and television announcements at 68.64% and 61.18% respectively have up to 80% ability to forewarn people of imminent natural disasters. The ability of the village courier to warn them is only up to 40% of the time according to 60% of the respondents.

The data show that personally- or household-owned communication media (cell phone, television and radio) provide immediate information to a wide number of communities provided a household has these items. Effectiveness of owning these communication media items also depends on the ability of household members owning them to share the warning about forthcoming natural calamities like typhoons and floods with their neighbours. This requires organizing a community-based warning system for disaster preparedness using the communication media that are popular among the residents.

**Table 31**. Early Warning Devices and Perceived Ability to Alert About Incoming Disasters

| Devices | Communi-ties | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| Siren | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 53 (100.00) | - | - | - | - | 53 (100.00) |
| | Roxaz | - | - | 1 (1.67) | 59 (98.33) | - | 60 (100.00) |
| Bell | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 50 (94.34) | 3 (5.66) | - | - | - | 53 (100.00) |
| Mega-Phone | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 46 (86.79) | 7 (13.21) | - | - | - | 53 (100.00) |
| | Roxaz | - | - | 54 (90.00) | 6 (10.00) | - | 60 (100.00) |
| Public Audio System | Dipolog | 102 (100.00) | - | - | - | - | 102 (100.00) |
| | Katipunan | 50 (100.00) | - | - | - | - | 50 (100.00) |
| | Manukan | 46 (86.79) | 7 (13.21) | - | - | - | 53 (100.00) |
| Cell phone | Dipolog | - | - | 10 (9.80) | 92 (90.20) | - | 102 (100.00) |
| | Katipunan | - | - | 25 (50.00) | 25 (50.00) | - | 50 (100.00) |
| | Manukan | - | - | 15 (28.30) | 38 (71.70) | - | 53 (100.00) |
| | Roxaz | - | - | 8 (13.33) | 52 (86.67) | - | 60 (100.00) |
| Television announce-Ment | Dipolog | - | - | 20 (19.61) | 82 (80.39) | - | 102 (100.00) |
| | Katipunan | - | 10 (20.00) | 30 (60.00) | 10 (20.00) | - | 50 (100.00) |
| | Manukan | - | - | 3 (5.66) | 50 (94.34) | - | 53 (100.00) |
| | Roxaz | - | - | 30 (50.00) | 30 (50.00) | - | 60 (100.00) |
| Village Courier | Dipolog | 36 (35.30) | 61 (59.80) | 5 (4.90) | - | - | 102 (100.00) |
| | Katipunan | - | 26 (52.00) | 24 (48.00) | - | - | 50 (100.00) |
| | Manukan | 14 (26.42) | 36 (67.92) | 3 (5.66) | - | - | 53 (100.00) |
| | Roxaz | - | - | 15 (25.00) | 45 (75.00) | - | 60 (100.00) |

## Avoidance of and Recovery from Accidents

After the efficiency of early warning devices, the next important question to the perception of households is vulnerability reduction or how to avoid and recover from accidents and/or disasters. The respondents were asked how they perceived the ability of their household and the community to avoid and/or recover from accidents in cases when these cannot be prevented from happening. They were made to point out their confidence level (measures as percent chance) that they can survice the threats of unforeseen or inevitable accidents. The data show variable results but a general picture is shown based on the modal confidence level or that with the highest percentage of responses.

For Dipolog and Manukan their modal confidence levels for their households to avoid accidents are up to 100% of the time, but only up to 80% and up to 60% for their communities, respectively. It is bimodal for Katipunan wherein the confidence levels for households range from up to 80% to up to 100%. However, they have a very high confidence level for their community, i.e., up to 100% for community. Meanwhile, 50% of the Roxas respondents rated their confidence level to only up to 60% for both household and community. Generally, based on the average of responses, the modal levels of confidence of all the respondents for their households and communities to avoid accidents at sea are equally up to 80% of the time.

**Table 32.** Level of Confidence in the Avoidance of and Recovery from Accidents

| Areas | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | No Answer | Total (%) |
|---|---|---|---|---|---|---|---|
| *Avoidance* | | | | | | | |
| Dipolog | | | | | | | |
| Household | 10 (9.80) | 10 (9.80) | 8 (7.84) | 27 (26.47) | 29 (28.43) | 18 (17.65) | 102 (99.99)* |
| Community | 10 (9.80) | 10 (9.80) | 13 (12.75) | 29 (28.43) | 21 (20.59) | 19 (18.63) | 102 (100.00) |
| Katipunan | | | | | | | |
| Household | - | - | 4 (20.00) | 23 (40.00) | 23 (40.00) | - | 50 (100.00) |
| Community | - | - | - | 18 (36.00) | 32 (64.00) | - | 50 (100.00) |
| Manukan | | | | | | | |
| Household | 7 (13.21) | 8 (15.10) | 11 (20.75) | 11 (20.75) | 15 (28.30) | 1 (1.89) | 53 (100.00) |
| Community | 7 (13.21) | 10 (18.87) | 20 (37.73) | 7 (13.21) | 8 (15.09) | 1 (1.89) | 53 (100.00) |
| Roxas | | | | | | | |
| Household | - | 15 (25.00) | 30 (50.00) | 15 (25.00) | - | - | 60 (100.00) |
| Community | - | 15 (25.00) | 30 (50.00) | 15 (25.00) | - | - | 60 (100.00) |
| *Recovery* | | | | | | | |
| Dipolog | | | | | | | |
| Household | 10 (9.80) | 10 (9.80) | 8 (7.84) | 27 (26.47) | 29 (28.43) | 18 (17.65) | 102 (99.99)* |
| Community | 10 (9.80) | 10 (9.80) | 13 (12.75) | 29 (28.43) | 21 (20.59) | 19 (18.63) | 102 (100.00) |
| Katipunan | | | | | | | |
| Household | 4 (8.00) | 4 (8.00) | 19 (38.00) | 11 (22.00) | 12 (24.00) | - | 50 (100.00) |
| Community | - | - | - | 20 (40.00) | 30 (60.00) | - | 50 (100.00) |
| Manukan | | | | | | | |
| Household | 7 (13.21) | 8 (15.10) | 11 (20.75) | 11 (20.75) | 15 (28.30) | 1 (1.89) | 53 (100.00) |
| Community | 7 (13.21) | 10 (18.87) | 20 (37.73) | 7 (13.21) | 8 (15.09) | 1 (1.89) | 53 (100.00) |
| Roxas | | | | | | | |
| Household | - | 15 (25.00) | 30 (50.00) | 15 (25.00) | - | - | 60 (100.00) |
| Community | - | 15 (25.00) | 30 (50.00) | 15 (25.00) | - | - | 60 (100.00) |

Meanwhile, the modal confidence levels to recover from accidents of respondents from Dipolog and Manukan are highest for their households (both up to 100%) as compared for their respective communities (up to 80% and up to 60%, respectively). The confidence levels of Katipunan and Roxas respondents for their households and communities do not vary but the ratings of the latter are lower compared to the former. The respondents from Katipunan equally have up to 100% confidence levels for their households and communities to recover, while Roxas respondents have only up to 60% confidence levels. Taken as a whole, however, a plurality of all the respondents have a confidence level of up to 60% for their households (29.15%) and up to 80% for their communities (26.66%) to recover from sea-related accidents.

## Perceptions on Climate Change

Natural calamities and disasters are not separate from what is happening now to the deteriorating natural environment which is generally associated with the climate change phenomenon (*pagkausob sa panahon*). People are becoming more aware of increasing frequency of flooding in one corner of the globe and drought in another and increasingly extreme weather events and unseasonal weather events associated with climate change. As this condition continues more people and communities, particularly in coastal areas, are more exposed to risk and disasters. How people respond or adapt to climate change largely depends upon what they perceive are the causes of climate change and what they perceive are likely to be the impacts of climate change. There is a need to introduce more the community to the science of climate change so they will understand the role humans have in environmental alterations.

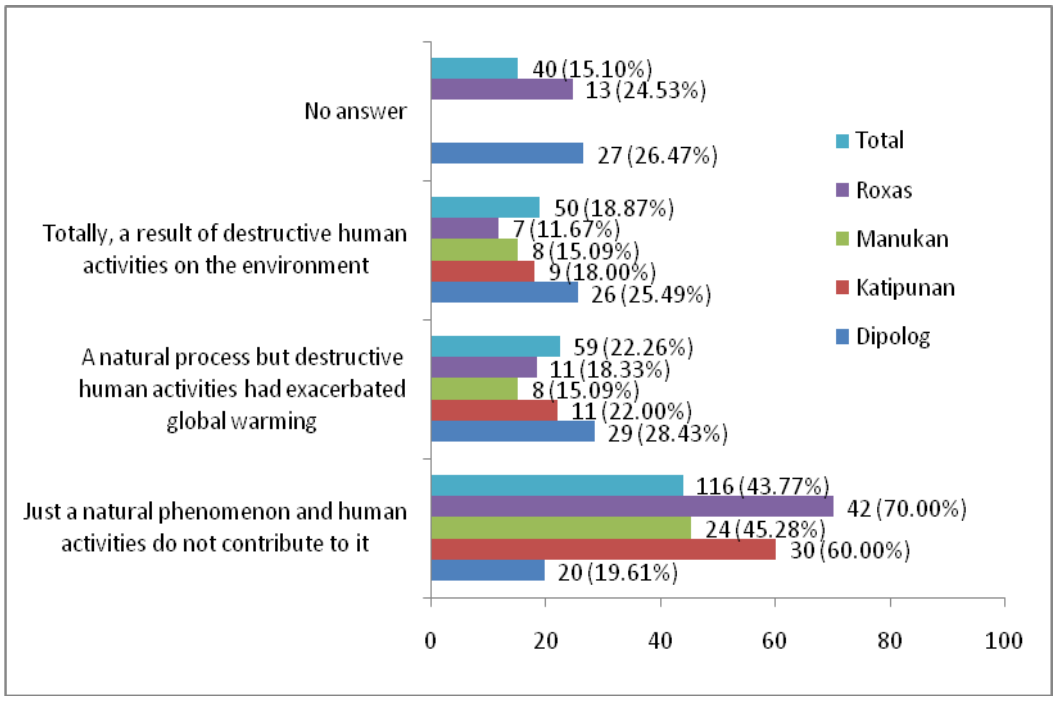


**Figure 23.** Respondent perceptions on the causes of climate change.

It is intriguing to know that a significant proportion of respondents perceived that climate change is just a natural phenomenon and that human activities do not contribute to it (43.77%). This perception is prevalent among the majority of the respondents from Roxas

(70.00%) and Katipunan (60.00%). Since a person's understanding of a phenomenon is most likely to affect his or her reaction to it, the perception that destructive human activities do not worsen climatic conditions will limit popular support for mitigating the impact of climate change. Nevertheless, 22% believe that although it is a natural process, destructive human activities had exacerbated global warning and this had caused changes in climatic conditions. Those who agreed with this perception is highest in Dipolog (28.43%) where a significant percentage also agreed that climate change is totally a product of destructive human activities on the environment (25.49%).

## Summary

Generally, respondents perceived that there had been fewer sea accidents during the last 12 months before the survey than five years ago. This perception may reflects that fishing households are more conscious now about sea safety while fishing, or it may reflect the results of government initiatives to protect the lives of people who are heavily dependent upon the sea for their main source of livelihood. Checking weather reports before every fishing trip is on top of the safety measures practiced by respondent households besides other precautionary and preventive measures they have adopted based on the list presented to them.

When disasters cannot be prevented and occur, the only recourse of the households is to be prepared, particularly when these are perennial community problems e.g. monsson flooding. More than half of the respondents admitted that they move to elevated areas when typhoons occur because flooding is always expected and this was particularly so for Katipunan and Manukan respondents. Moving to elevated areas is coupled with storing enough food and conducting community earthquake and fire event drills.

The early warning devices that respondents perceived were better for alerting them about forthcoming disasters are those that a person or the households can acquire. These include a cell phone, radio and television which they rated to have the ability of up to 80%. Information from friends and relatives can be relayed by cell phone provided that there is a signal, while the concerned government agencies can announce over the radio and television the forthcoming danger. The immediate dissemination of warnings allows affected households and/or communities to evacuate to safer areas when necessary.

Meanwhile, the levels of confidence of the respondents that their households and communities can avoid accidents are both 80% of the time. But their confidence level that their households can recover from accidents is only up to 60%, while it is up to 80% for their communities. Although accidents and disasters usually happened because of human negligence or lack of focus, it cannot be denied that these can be worsened by natural calamities like typhoons and floods. Incidentally, a significant proportion of respondents perceived that climatic change, which some believed to have triggered more and stronger typhoons now, is only a natural phenomenon and that human activities do not contribute to it.

# Chapter VI

# FISHERIES POST-HARVESTING AND MARKETING

Value-addition happens when fishery products are processed from their raw state into other finished and consumable products, for example, fresh fish to bottled sardines or dried fish. But the quality of the processed products depends upon the knowledge and skills of individuals who are involved in post-harvesting activities. The same is true of maintaining the safety of the raw and finished products by fishers and/or processors during the production stage through to marketing and end consumption. This chapter will examine these issues in order to identify the areas in post-harvesting and marketing where the knowledge and skills of fishing households requiring improvement.

## Knowledge and Skills in Post-Harvest

Generally, based on the distribution per site, only a few households are engaged with the following post harvest practices: smoking (3.40%), sauce making (6.79%), canning (27.17%), packaging (31.70%) and brining (42.64%). The post-harvest practices that the majority are reportedly engaged in are sun drying (81.13%), salting (88.68%), chilling (78.11%) and freezing (59.25%). Notably, the latter are practices that do not require high technical skills and resource investment which makes them common among households. Those practices in which few people are engaged may be processing methods which require greater skills and investment, but which probably add greater value to the fish catch.

Dipolog respondents were more aware of and knowledgeable of the different post-harvest practices (up to 100% of the needed skills for the work) than respondents from other sites and in particularly for canning, brining and freezing. It is important to note that it is only in Dipolog among study sites where bottled sardine production is a flourishing enterprise and this may explain their advanced post harvest technology state. They also lead in sun drying and salting together with the Manukan respondents. As a whole, up to 60% is the model level of knowledge and skills of the needed knowledge and skills for doing certain tasks of those households engaged in post harvest activities. However there is still more room for improvement and more households should be encouraged to engage in value-adding activities.

**Table 33.** Level of Knowledge and Skills of Households on Post Harvest Practices

| Post Harvest Practices | Not Engaged (%) | Up to 20% (%) | Up to 40% (%) | Up to 60% (%) | Up to 80% (%) | Up to 100% (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| Smoking | | | | | | | |
| Dipolog | 96 (94.12) | - | 2(1.96) | 3(2.94) | 1(0.98) | - | 102 (100.00) |
| Katipunan | 48 (96.00) | 2(4.00) | - | - | - | - | 50 (100.00) |
| Manukan | 53 (100.00) | - | - | - | - | - | 53 (100.00) |
| Roxas | 59 (98.33) | 1(1.67) | - | - | - | - | 60 (100.00) |
| Sauce Making | | | | | | | |
| Dipolog | 95 (93.14) | 2 (1.96) | 3(2.94) | 1(0.98) | 1(0.98) | - | 102 (100.00) |
| Katipunan | 47 (94.00) | - | 1(2.00) | 2(4.00) | - | - | 50 (100.00) |
| Manukan | 49 (92.45) | 2 (3.77) | 1(1.89) | 1(1.89) | - | - | 53 (100.00) |
| Roxas | 56 (93.33) | - | 1(1.67) | 3(5.00) | - | - | 60 (100.00) |
| Canning | | | | | | | |
| Dipolog | 30 (29.41) | 15 (14.71) | 19 (18.63) | - | 7(6.86) | 31(30.39) | 102 (100.00) |
| Katipunan | 50 (100.00) | - | - | - | - | - | 50 (100.00) |
| Manukan | 53 (100.00) | - | - | - | - | - | 53 (100.00) |
| Roxas | 60 (100.00) | - | - | - | - | - | 60 (100.00) |
| Packaging | | | | | | | |
| Dipolog | 69 (67.65) | 12 (11.76) | 1 (0.98) | 15 (14.71) | 5 (4.90) | - | 102 (100.00) |
| Katipunan | 45 (90.00) | 2 (4.00) | 1 (2.00) | 1 (2.00) | 1 (2.00) | - | 50 (100.00) |
| Manukan | 25 (47.17) | 24 (11.76) | - | 3 (5.66) | 1 (1.89) | - | 53 (100.00) |
| Roxas | 42 (70.00) | - | 5 (8.33) | 13 (21.67) | - | - | 60 (100.00) |
| Brining | | | | | | | |
| Dipolog | 62 (60.79) | 9 (8.82) | 5 (4.90) | 8 (7.84) | 7 (6.86) | 11(10.79) | 102 (100.00) |
| Katipunan | 18 (36.00) | 8 (16.00) | 6 (12.00) | 6 (12.00) | 7 (14.00) | 5 (10.00) | 50 (100.00) |
| Manukan | 15 (28.30) | 21 (39.62) | 2 (3.77) | 5 (9.44) | 8 (15.10) | 2 (3.77) | 53 (100.00) |
| Roxas | 24 (40.00) | 2 (3.33) | 6 (10.00) | 12 (20.00) | 11 (18.34) | 5 (8.33) | 60 (100.00) |
| Freezing | | | | | | | |
| Dipolog | 18 (17.65) | 11(10.78) | 14 (13.72) | 17 (16.67) | 21(20.59) | 21 (20.59) | 102 (100.00) |
| Katipunan | 29 (58.00) | 5 (10.00) | 3 (6.00) | 8 (16.00) | 2 (4.00) | 3 (6.00) | 50 (100.00) |
| Manukan | 18 (33.96) | 17 (32.08) | 2 (3.77) | 2 (3.77) | 9 (16.98) | 5 (9.44) | 53 (100.00) |
| Roxas | 43 (71.67) | 5 (8.33) | 2 (3.33) | 3 (5.00) | 3 (5.00) | 4 (6.67) | 60 (100.00) |
| Chilling | | | | | | | |
| Dipolog | 34 (33.33) | 6 (5.88) | 14 (13.73) | 12 (11.76) | 21(20.59) | 15 (14.71) | 102 (100.00) |
| Katipunan | 11 (22.00) | 9 (18.00) | 16 (32.00) | 5 (10.00) | 8 (16.00) | 1(2.00) | 50 (100.00) |
| Manukan | 4 (7.55) | 24 (45.28) | 3 (5.66) | 9 (16.98) | 8 (15.10) | 5 (9.43) | 53 (100.00) |
| Roxas | 9 (15.00) | 5(8.33) | 7 (11.67) | 32 (53.33) | - | 7 (11.67) | 60 (100.00) |
| Sun Drying | | | | | | | |
| Dipolog | 10 (9.80) | 19 (18.63) | 17 (16.67) | 21 (20.59) | 12 (11.76) | 23 (22.55) | 102 (100.00) |
| Katipunan | 20 (40.00) | 4 (8.00) | 6 (12.00) | 8 (16.00) | 8 (16.00) | 4 (8.00) | 50 (100.00) |
| Manukan | 10 (18.87) | 5 (9.43) | 7 (13.21) | 9 (16.98) | 13 (24.53) | 9 (16.98) | 53 (100.00) |
| Roxas | 10 (16.67) | 4 (6.67) | 8 (13.33) | 13 (21.67) | 11 (18.33) | 14 (23.33) | 60 (100.00) |
| Salting | 30 (11.32) | 22 (80.30) | 36 (13.59) | 51 (19.24) | 63 (23.77) | 63 (23.77) | |
| Dipolog | 11 (10.78) | 12 (11.76) | 13 (12.75) | 24 (23.53) | 17 (16.67) | 25 (24.51) | 102 (100.00) |
| Katipunan | 8 (16.00) | 5 (10.00) | 9 (18.00) | 8 (16.00) | 11 (22.00) | 9 (18.00) | 50 (100.00) |
| Manukan | 6 (11.32) | 2 (3.77) | 9 (16.98) | 2 (3.77) | 14 (26.42) | 20 (37.74) | 53 (100.00) |
| Roxas | 5 (8.33) | 3 (5.00) | 5 (8.33) | 17 (28.34) | 21 (35.00) | 9 (15.00) | 60 (100.00) |
| | 1,242 | 236 (20.65) | 188 (16.45) | 263 (23.00) | 228 (19.95) | 228 (19.95) | 2385 |

## Awareness of Safe, Sanitary and Healthy Ways

Among other matters needed for a more productive post-harvest activity is the awareness of fishing households about food safety, sanitary and hygienic ways of food

processing and preservation. It is not only important to have households that are skilled in food processing, but they must be also adept in ensuring that the fish products they produced are food safe for the consuming public. Food poisoning due to contaminated or improperly processed food have caused deaths in coastal communities, which incidentally often have insufficient medical facilities because of under-development. Knowing what proportion of the population is aware of food safety standards will help in determining what information and skills training they would benefit from.

**Table 34**. Awareness of Safe, Sanitary and Healthy Ways of Food Processing and Preservation

| Safe, Sanitary and Healthy Ways | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Landed fish should not be exposed to the sun and should be iced. | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Fish should be inspected for appearance and odour and fish of unacceptable quality should be rejected. | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |
| Wastes should be disposed of sanitarily. | 60 (58.82) | 17 (34.00) | 16 (30.19) | 25 (41.67) | 118 (44.53) |
| Cold storage equipment should be checked to ensure that the right temperature is being maintained. | 89 (87.25) | - | - | - | 89 (33.59) |
| A cleaning schedule should be followed for all work areas | 33 (32.35) | 17 (34.00) | 11 (20.75) | 11 (18.33) | 72 (27.17) |
| Smoking and spitting in work areas should not be permitted and hands must be washed with bactericidal soap prior to handling fish and after a visit to the toilet. | 32 (31.37) | 14 (28.00) | 12 (22.64) | 10 (16.67) | 68 (25.66) |
| Bacteriological tests on representative samples of processed fish should be conducted. | 39 (38.24) | 9 (18.00) | 9 (17.00) | 8 (13.33) | 65 (24.53) |
| Water and ice samples should be analyzed as per testing schedule by ISO certified laboratories for levels of chemical and bacteriological contamination and potability. | 23 (22.55) | 6 (12.00) | 6 (11.32) | 14 (23.33) | 49 (18.49) |
| The harbour should be free of animals, rodents and pests. | 18 (17.64) | 6 (12.00) | 9 (16.98) | 8 (13.33) | 41 (15.47) |
| There should be no bird nests in the fish handling area. | 18 (17.65) | 3 (6.00) | 4 (7.55) | 5 (8.33) | 30 (11.32) |
| Toilet should be present in processing centres with adequate water supply. | 13 (12.75) | 3 (6.00) | 7 (13.21) | 5 (8.33) | 28 (10.57) |
| All drainage systems should be ensured to be in good working order. | 16 (15.69) | 4 (8.00) | 2 (3.77) | 2 (3.33) | 24 (9.06) |
| Toilet and shower facilities should be kept clean and in perfect working order. | 10 (9.80) | 4 (8.00) | 5 (9.43) | 2 (3.33) | 21 (7.92) |
| All precaution and warning signs should be readable | 11 (10.78) | 1 (2.00) | 2 (3.77) | 3 (5.00) | 17 (6.42) |
| All fish slime and blood should be removed by hosing down with chlorinated water and at the end of the day all surfaces should be rinsed with clean water having 5 ppm of chlorine. | 9 (8.82) | 1 (2.00) | 2 (3.77) | 2 (3.33) | 14 (5.28) |

All the respondents in the four study sites are aware of the following safe, sanitary and healthy ways of food processing and preservation: firstly, landed fish should not be exposed to the sun and should be iced, and secondly, fish should be inspected for appearance and odour and those of unacceptable quality should be rejected. Incidentally, less than 50% are aware or familiar with the remaining measures presented to them, which implies a lack of knowledge of the majority of fishing households about some simple and practical practices to prevent contamination of processed food products. On the average, it is computed that only 29% of all respondents are aware of all the safety measures presented to them. Nonetheless there are significant percentages of respondents from Dipolog who are more knowledgeable.

It is only among this site that 87% and about 59% who reported the need to always check cold storage equipment and properly dispose of wastes, respectively.

## Participation of Women and Children

The participation of mothers or women as well as their children, of households who are engaged in fish product processing and marketing, can be better appreciated if they are compared with the participation of the fathers or men. A quick comparison of the data reveals that there are more women than men who are reported to be involved in fish product processing and marketing. This can further be examined by adding all the numbers of those involved in post-harvesting activities per site divided by the number of tasks in order to derive the average number of involved household members categorized by position. The average number involved is then divided by the number of households surveyed to get the average number involved in all post-harvesting activities listed.

The data show that about 21% reported the women or mothers to be involved as compared to only 15% men or fathers. Similarly, 8% reported the involvement of daughters while only 5% reported the sons in particular activities. It is only in the chilling process where men are predominant over women, with the except of Katipunan where more women are reported to be involved in chilling than men. In addition to leading in chilling, the women from Katipunan also reported being more involved in brining and canning than women from the other areas. Meanwhile, the Dipolog women are more involved in fermenting, packaging, sun drying, smoking and sauce making. Roxas women are dominant in salting, peddling around, delivering to buyers and vending in the market.

Among the children, sons participated more in chilling, freezing, canning and smoking than daughters, but daughters dominated the remainder of the processing activities being done by their parents. Generally, the daughters tend to follow the trend of their mothers' participation in post harvest activities and outnumbered the sons in most of those cited activities dominated by their mothers. It is inferred that gender role socialization is at work in the fishing industry wherein the mothers train their daughters. Sons are more likely to work with and be training by their fathers, though this depends on the tasks being performed.

**Table 35.** Members of the Households Involved in Fish Product Processing and Marketing

| Activities | Communities | Household Members Involved | | | |
|---|---|---|---|---|---|
| | | Father (%) | Mother (%) | Sons (%) | Daughters (%) |
| Chilling | Dipolog | 66 (64.71) | - | 9 (8.82) | - |
| | Katipunan | 38 (76.00) | 40 (80.00) | 7 (14.00) | 5 (10.00) |
| | Manukan | 7 (13.21) | - | 2 (3.77) | - |
| | Roxas | 13 (21.67) | 3 (5.00) | 2 (3.33) | - |
| Freezing | Dipolog | 33 (32.35) | 18 (17.65) | 15 (14.71) | 5 (4.90) |
| Brining | Dipolog | 38 (37.25) | 42 (41.18) | 14 (13.73) | 19 (18.63) |
| | Katipunan | 18 (36.00) | 22 (44.00) | 1 (2.00) | 4 (8.00) |
| | Manukan | 8 (15.09) | 10 (18.87) | - | - |
| | Roxas | 6 (10.00) | 8 (13.33) | - | - |
| Canning | Katipunan | 17 (34.00) | 21 (42.00) | 6 (12.00) | 4 (8.00) |
| | Manukan | 16 (30.19) | 3 (5.66) | 10 (18.87) | 4 (7.55) |
| | Roxas | 8 (13.33) | 23 (38.33) | 5 (8.33) | 6 (10.00) |
| Fermenting | Dipolog | 4 (3.92) | 10 (9.80) | - | 3 (2.94) |
| | Katipunan | 1 (2.00) | 2 (4.00) | - | 1 (2.00) |
| | Manukan | 2 (3.77) | 4 (7.55) | - | 3 (5.66) |

| Activities | Communities | Household Members Involved | | | |
|---|---|---|---|---|---|
| | | Father (%) | Mother (%) | Sons (%) | Daughters (%) |
| | Roxas | 2 (3.33) | 3 (5.00) | - | 2 (3.33) |
| Packaging | Dipolog | 4 (3.92) | 6 (6.86) | 1 (0.98) | 3 (2.94) |
| | Katipunan | 1 (2.00) | 1 (2.00) | - | - |
| | Manukan | 1 (1.89) | 1 (1.89) | - | - |
| | Roxas | 1 (1.67) | 1 (1.67) | - | - |
| Sun drying | Dipolog | 21 (20.59) | 15 (14.71) | 8 (7.84) | 3 (2.94) |
| | Katipunan | 1 (2.00) | 2 (4.00) | - | - |
| | Manukan | 3 (5.66) | 6 (11.32) | - | 2 (3.77) |
| | Roxas | 3 (5.00) | 7 (11.67) | - | 3 (5.00) |
| Smoking | Dipolog | 38 (37.25) | 43 (42.16) | 11 (10.78) | 7 (6.86) |
| | Katipunan | 15 (30.00) | 21 (42.00) | 10 (2.00) | 10 (2.00) |
| Salting | Dipolog | 2 (1.96) | - | - | - |
| | Katipunan | 17 (34.00) | 16 (32.00) | 4 (8.00) | 10 (20.00) |
| | Manukan | 15 (28.30) | 16 (30.19) | 6 (11.32) | 10 (18.87) |
| | Roxas | 19 (31.67) | 23 (38.33) | 7 (11.67) | 10 (16.67) |
| Sauce making | Dipolog | 1 (1.96) | 9 (8.82) | - | 4 (3.92) |
| | Manukan | 1 (1.89) | - | - | - |
| | Roxas | 2 (3.33) | 3 (5.00) | - | - |
| Peddling around the community | Dipolog | 19 (18.63) | 54 (52.94) | - | 29 (28.43) |
| | Katipunan | 4 (8.00) | 29 (58.00) | 3 (6.00) | 13 (26.00) |
| | Manukan | 12 (22.64) | 18 (33.96) | 8 (15.09) | 11 (20.75) |
| | Roxas | 5 (8.33) | 36 (60.00) | - | 19 (31.67) |
| Delivering to buyers | Dipolog | 32 (31.37) | 35 (34.31) | 12 (11.76) | 18 (17.65) |
| | Katipunan | 2 (4.00) | 15 (30.00) | 4 (8.00) | 11 (22.00) |
| | Manukan | 14 (26.42) | 20 (37.74) | 11 (20.75) | 8 (15.09) |
| | Roxas | 2 (3.33) | 36 (60.00) | 3 (5.00) | - |
| Vending in the market | Dipolog | - | 37 (36.27) | - | 26 (25.49) |
| | Katipunan | 6 (12.00) | 13 (26.00) | - | 10 (20.00) |
| | Manukan | 7 (13.21) | 20 (37.74) | - | 11 (20.75) |
| | Roxas | 7 (11.67) | 29 (48.33) | - | 13 (21.67) |

## Common Problems in Ensuring the Quality of Fishery Products

The problems repeatedly mentioned by the respondents can be categorized into the lack of enough knowledge, limited or absence of infrastructure for fish preservation and unstable market and price. And there are some problems which are common to all sites and those that are experienced only by one or two. The most common problem among all sites include the lack of training of fishers in fish preservation, lack of knowledge specifically in freezing methods as well as other methods to ensure the quality of fishery products, and the absence of solid (permanent) fish carrier to transport fresh fish to the market. The need to conduct intensive training on post-harvesting technology to ensure the quality of processed fishery products is apparent in these problems.

Other problems reported only in Katipunan, Manukan and Roxas involve the lack of infrastructure such as ice plants, storage facilities and fish ports and the scarcity of fish containers needed to transport fish to market. Meanwhile, the lack of ice is reported only in Katipunan and Manukan and the absence of solar dryers is reported in Dipolog and Manukan. The problems that are unique only in Manukan revolve around having no fishery technician working in the municipality, the scarcity of salt for fish drying or sauce making, not having enough fish buyers, which is coupled with the distance to market. Dipolog respondents

reported the least number of problems, while those in Manukan experienced all the problems listed in Table 30.

**Table 36.** Common Problems in Ensuring the Quality of Fishery Products

| Common Problems Cited | Dipolog | Katipunan | Manukan | Roxas |
|---|---|---|---|---|
| 1. Lack training in preserving the fish | ✓ | ✓ | ✓ | ✓ |
| 2. Lack knowledge in freezing methods | ✓ | ✓ | ✓ | ✓ |
| 3. Lack knowledge about other methods | ✓ | ✓ | ✓ | ✓ |
| 4. No fishery technician | | | ✓ | |
| 5. No permanent fish carrier | ✓ | ✓ | ✓ | ✓ |
| 6. No fish port | | ✓ | ✓ | ✓ |
| 7. No ice plant and storage facilities | | ✓ | ✓ | ✓ |
| 8. Lack supply of ice | | ✓ | ✓ | |
| 9. Lack of containers | | ✓ | ✓ | ✓ |
| 10. No solar dryer | ✓ | | ✓ | |
| 11. Scarcity of salt supply | | | ✓ | |
| 12.Not enough buyers | | | ✓ | |
| 13. Far from the market | | | ✓ | |

## Problems Encountered by Sardine Fisheries and Processing

Sardine production in Dipolog City has made its name in history and Zamboanga del Norte is known as the bottled sardine capital of the Philippines. The province supplies bottled sardines both to local and national markets as well as abroad. Some have been certified by the Bureau of Food and Drugs (BFAD), while Montaño and Mendoza have been accredited by both BFAD and HACCP (Hazard Analysis and Critical Control Points).

Interviews with key informants involved in bottled sardine production revealed that small and big producers are facing similar problems which can be classified as natural, social and technical. Natural problems are associated with weather conditions like typhoons which not only hamper going to sea to fish, but also constrain solar drying of sardines duing processing. Natural issues disrupt the steady flow of raw materials (i.e., *tuloy* and Sardinella) and the supply of other input materials like oil and bottles, etc. The freshness and the quality of fish are also problems because of the limited knowledge and facilities of fishers for preserving fish.

Social problems concern labour quality and the attitude of workers about producing quality products, while technical problems are related to the production and marketing process. Meeting the BFAD standards for approval imposes stricter hygience and technical requirements, which require additional investment. One of the requirements is laboratory analysis and the proper packaging of the products which are considered too expensive for smaller bottled sardine companies. They also have a technical problem on spoilage due to cap leakage, which can result in food safety issues. Another problem is how to effectively market and promote their product in the market because of the high costs involved. And even when they are able to market their products, bottled sardine producers often suffer by delayed payment by consignees, which can result in cash flow problems. Any effort to sustain the whole sardine industry requires greater effort to regulate the sardine catch, ensuring processed product food safety due to spoilage and contamination, provisioning of needed

financial assistance and infrastructure, increasing the market, promoting quality workers and so on.

## Unsold Fish Disposal

Fish is a perishable product and it has to remain fresh, if not processed, so that it can be sold for human consumption. In the absence of infrastructure and technology to preserve fish, poor fishers have to ensure that they can immediately dispose of (sell) their catch. But there are instances where they are unable to sell their catch for human consumption i.e. when there are no buyers or when buyers have refused to buy the product because of concerns over freshness. Being unable to sell fish is most common during peak catch season and when the fish caught are under-sized, are of non preferred species by the buyers and were caught by fishing methods which damage the sardines.

When unable to sell their fish 69% said they have consumed the fish within the home, while 63% reported dryind or salting fish. Majority of the households in Dipolog, Roxas and Manukan are doing these but not much in Katipunan. Almost 43% of all the respondents reported giving fish to neighbours and particularly in Dipolog (96.08%). Overall a few surveyed households (13.59%) processed the unsold fish into sauce, except in Dipolog where 34% were engaged in sauce making using unsold sardines.

**Table 37.** Utilization of Unsold Fish

| Utilization | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Served only as viand for family | 84 (82.35) | 16 (32.00) | 36 (67.92) | 47 (78.33) | 183 (69.06) |
| Turned into dried fish or salted fish | 65 (63.72) | 23 (46.00) | 37 (69.81) | 43 (71.67) | 168 (63.40) |
| Given to neighbours and friends | 98 (96.08) | 8 (16.00) | 8 (15.09) | 13 (21.67) | 127 (47.92) |
| Made into sauce | 35 (34.31) | - | 1 (1.89) | - | 36 (13.59) |

Multiple responses

## Suggestions to Improve Post-Harvest Processing and Marketing

In order to ensure and improve the quality of the fishery products there is that urgency of improving post harvest processing and marketing. The respondents have suggestions how to proceed and achieve these goals as well as identify what government agencies should spearhead these initiatives. Firstly, they mentioned that DA-BFAR in coordination with the local government units, academic institutions and non-government organizations should conduct orientations and seminars on proper and acceptable post harvest practices. The fishers should be informed also about new techniques on storing, preserving and processing fish as well the strategies on how to obtain better prices for their processed products.

Since the local fishing communities have problems of getting their fish to the market on time and to obtain a better price, the respondents likewise suggested to the local government officials to secure and provide them permanent fish carriers and to conduct regular meetings with those in the fishery sector in order to share information on market and price. Specifically, the respondents proposed that the local government units in the study sites should construct their respective ice plants and storage facilities. This would permit the local fishers to keep their fish catches for a longer period before marketing these, especially during abundant seasons when the market is flooded with supply, in order to command for a better

price. This will maintain fish quality, while the proportion fish sold fresh will increase and the fish supply will be steadier.

Moreover, local government officials should enforce regulations and prohibitions on catching small fishes so that they grow to maturity and spawn. Catching juveniles is a false economy as they can only be sold for low market price and are often rejected by buyers. This will ensure greater recruitment and more money for the catch. Strict regulation of the fishery, and limits on catch and effort requires concerned government agencies to provide alternative livelihoods options for affected households to cushion the sudden and temporary drop in the income of households involved in fishing or fish processing.

## Perceived Influence of Fishers on the Market

Knowing in what ways or how the fishers had influenced the market requires looking into what they usually do with their fish catch. If they are trading this in the market and not only consuming it at home then they can influence the supply and the corresponding price per unit. Interviews revealed that they usually sell to local fish buyers and to middle buyers that sell fish outside of their communities. There are also a good number of households that peddle their catch around the neighbourhood or the local market. The number who said that their fish catch was only for household consumption was minimal suggesting that fishing in study sites a major livelihood and income source of many respondent households. This further explains why majority (83.77%) agreed that fishers have some influence in the market.

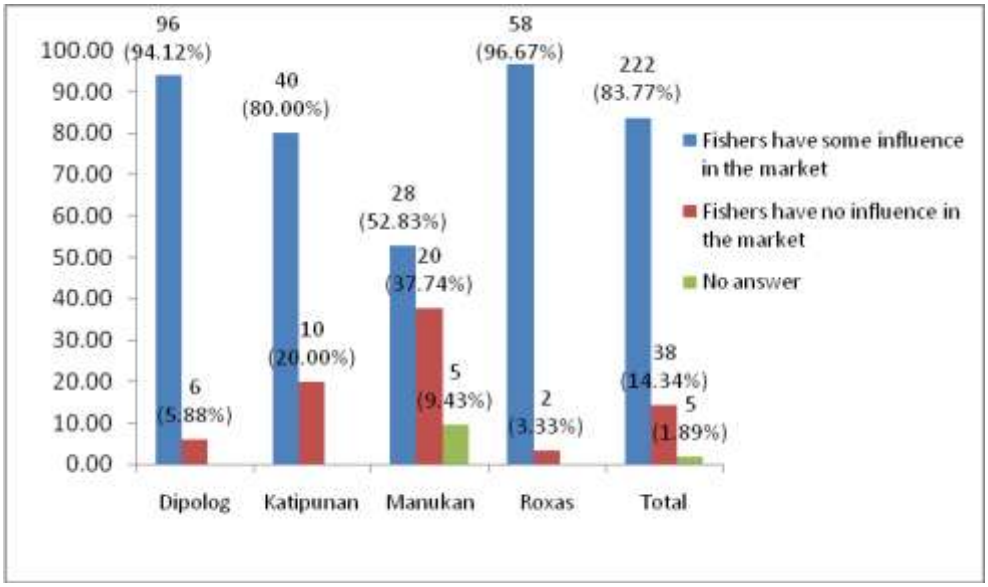


**Figure 24.** Perceptions of whether fishers influenced the market.

The ways the fishers have influenced the market as perceived by all the respondents covered the domains of supply (77.36%), price (14.34%) and quality (8.30%) of fish they sell. But take note that the influence on the market of the fishing industry is not limited only to the fishers but also to the fish processors who are engaged in the production of bottled sardines, dried and salted fish and other related fish products. The respondents from Manukan (86.80%) scored highest among those who said that the influence of fishers in the market is in the volume of fish they supply the market or the consumers, which certainly affects the price. The influence of fishers in terms of price is, therefore, an offshoot of their influence on the

supply and therefore the price. The lower the supply the higher the price because there will be strong demand.

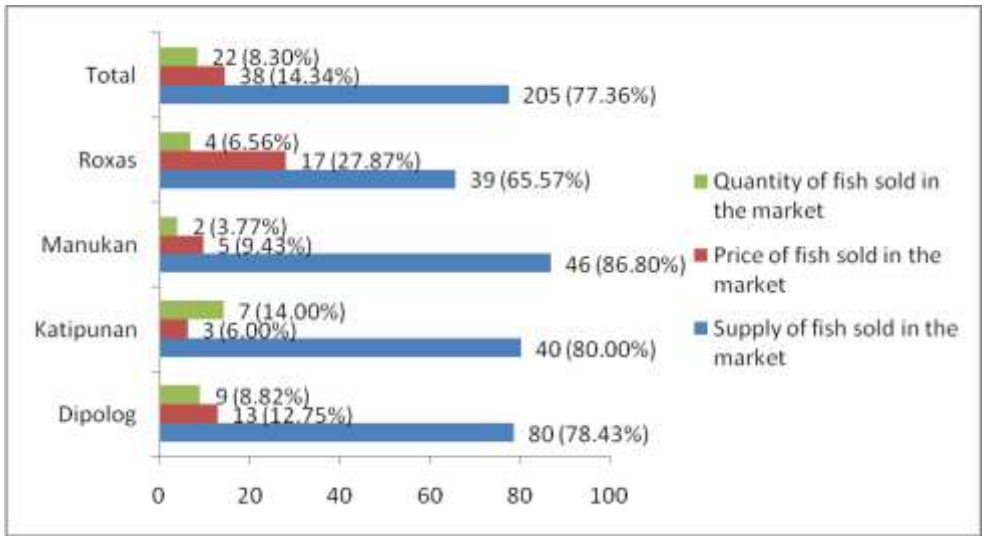


**Figure 25.** Ways fishers are perceived to have influenced the market.

## Summary

The knowledge and skills of productive members of fishing households are both important for aquatic product post-harvest. In the study sites, the most commonly conducted post-harvest practices that the majority of the respondents are engaged in includes sun drying, salting, chilling and freezing. Although there was considerable variation, overall there is a low level of awareness among the respondents about food safe, sanitary and hygienic ways of aquatic product processing and preservation, with average awareness levels showing that only 29% of all the respondents are aware of the aquatic product safety measures presented to them. The only two measures presented which the majority of respondents were aware of were icing fish to preserve it and rejecting fish of unacceptable quality. Less than 50% are aware of the other food safety measures, suggesting the need for more information, education and communication (IEC).

In terms of the participation of women and children relative to the men in fish product processing and marketing, the data shows that about 21% reported the women or mothers to be involved as compared to only 15% men or fathers. Similarly, 8% reported the involvement of daughters, while only 5% reported their sons assisting with particular activities. There is gender role stereotyping as well as socialization in fis hing households where women assume less strenuous tasks and daughters are more likely to perform those tasks dominated by their mothers. It is also true that sons are more likely to be working closely with their fathers, except in instances where they have to help their mothers with heavier tasks.

Fishing households face a variety of constraints which limit the quality of their processed aquatic products. These problems include their limited knowledge and skills of preservation techniques, their lack of transportation to take fish to the market, the absence of ice plants and storage facilities among others. Specifically, the problems confronting those engaged in the bottling of sardines can be categorized into natural, social and technical. The main natural problems include bad weather (i.e. typhoons) that prevents fishing and affects

the steady supply of fish and hampers fish drying when bottling sardines. Technical problems refer to their limited knowledge and availability of facilities for preserving fish. The limited skills of the labor force and the poor attitudes of workers toward product quality are social problems. These problem areas in post-harvesting and marketing should be the targets of interventions by concerned government agencies and the private sector.

Meanwhile, there are instances when fish and sardines in particular cannot be sold for human consumption because buyers refuse to buy them when they are sub-standard. Unsold fish is eaten within the family, given to neighbours, dried, salted, made into fish sauce, used as animal feed or sent for fish meal production.

Fishers have some influence on the market, because they primarily impact on aquatic product volume, and supply, and quality, which largely determine aquatic product price.

# Chapter VII

# LIVELIHOODS ENHANCEMENT AND DIVERSIFICATION AND MICRO-FINANCING

Fishery resources are declining and this situation will worsen in the future unless there are considerable efforts to control population increases and efforts are made to limit fishing pressure on the available natural resources. Birth control is controversial because of religious and political differences. Therefore alternative livelihoods activities are needed to provide income sources as fish catches and CPUE decline. This part of the survey examined the perceptions of respondents on their current livelihoods and their attitude to livelihoods change, as well as the available opportunities like financial support for new economic ventures.

## Attitudes Toward Changing or Diversifying Livelihoods

The majority of the respondents (72.08%) thought that livelihoods now are probably less diverse than they will be in 2020. Only 15% considered livelihoods opportunities in the 1990's were more diverse than in the present period. Generally respondents were optimistic of a better future ahead, and specifically in the 2020s. Manuhan were more pessimistic, with less than 50% of the respondents expecting the future to offer better livelihoods opportunities while Dipolog (85.29%) respondents are the most optimistic.

**Table 38.** Perceptions Regarding Livelihood Diversity

| Perceptions | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Less diverse livelihoods from 2000 up to present compared to the future (2020s) | 87 (85.29) | 39 (78.00) | 26 (49.05) | 39 (65.00) | 191 (72.08) |
| More diverse livelihoods in the 1990s compared to 2000 up to present. | 12 (11.77) | 2 (4.00) | 23 (43.40) | 4 (6.67) | 41 (15.47) |
| Similar diversity of livelihoods in the 1990s compared to 2000 up to the present | 3 (2.94) | 9 (18.00) | 4 (7.55) | 17 (28.33) | 33 (12.45) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

Overall 52% of respondents do not favour changing their livelihoods and particularly all the respondents from Roxas (100.00%). In contrast, the majority of the respondents from Manukan (71.70%), Katipunan (68.00%) and Dipolog (52.94%) were willing to consider changing their livelihoods. Why are Roxas respondents more positive about fishing? Perhaps they perceive that the industry will offer a better future than the other respondents. With significant numbers of respondents believing that the future offers more diverse livelihood opportunities many may leave fishing if they feel fishing to be less profitable than economic opportunities.

**Table 39.** Attitudes Toward Livelihoods Change

| Attitudes | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| In favour of changing their livelihood | 54 (52.94) | 34 (68.00) | 38 (71.70) | - | 126 (47.55) |
| Not in favour of changing their livelihood | 48 (47.06) | 16 (32.00) | 15 (28.30) | 60 (100.00) | 139 (52.45) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

While there have been some livelihood training activities provided by the local government units and some non-government organizations, the results have yet to be felt. Sometimes those who had participated the training are not able to practice what skills they have learned and to earn from them because they do not have capital to invest in certain ventures. From the list provided by key informants from Dipolog, Katipunan and Roxas, it is noted that most of the livelihood training courses are on food processing involving agricultural products (banana, cassava, peanut), animal raising (poultry, goat and swine), handicrafts making (using coconut shell and husk) and book or record keeping. Certainly, if these can provide sufficient income for households their dependency on fishing can be minimized which if enough households benefit from the training will ultimately result in reduced pressure upon fishery resources, if new entrants into fishing are controlled. However, a new livelihood option requires capital to start up. The next section of this chapter looks into the micro-financing systems in the study sites.

## Overview of Micro-financing Schemes

Apporimately one in four of surveyed households (24.91%) had made use of the financial services from formal institutions. This is lowest in Roxas (8.33%) and highest in Manukan (41.51%). Having no fixed income and limited assets to serve as collateral were the main reasons given by respondents for not assessing financial service from formal institutions. Ironically, these are also the households that most need financial support in order to get away from poverty, but whose condition prevent them from getting loans from formal financial institutions.

A summary of the list of formal financial institutions used by the respondents' households for some services shows that these include rural banks, lending agencies, commercial banks and cooperatives. Interestingly, the rural banks they used also included banks from other municipalities and even some outside the Dipolog Bay area. The same can be said of the lending agencies. Overall 43% of the respondent households used rural banks for financial matters, while the balance distributed between lending agencies or organizations, and commercial banks.

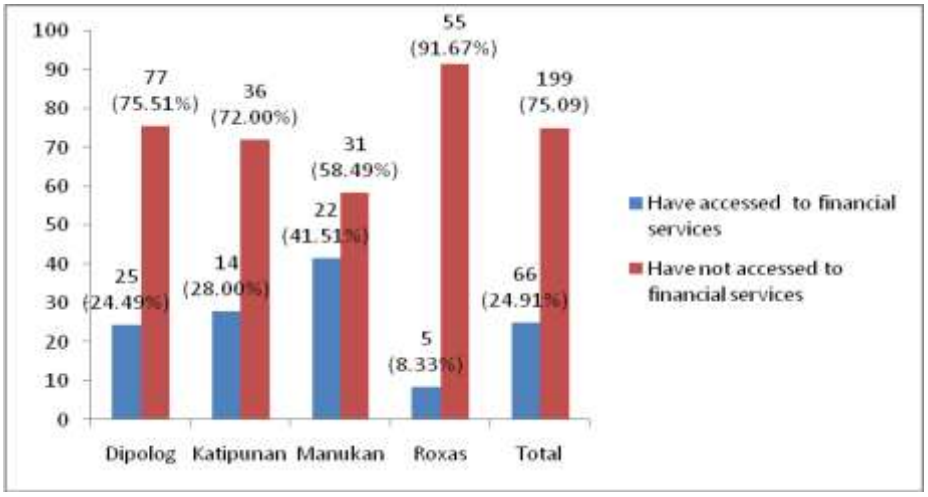


**Figure 26.** Households availing services from formal financial institutions.

The rural banks are popular with respondents in the four study sites (43.39%), but those from Dipolog reported using a wider array of formal financial institutions than the other surveyed areas. They have more access to money if they wish to borrow either for productive or consumptive use. But the Center for Agriculture and Rural Development (CARD) it was reported by respondents outside of Dipolog is a better option if they were unable to access loans from rural banks. Overall the CARD was the second most used specifically named formal financial institution (18.18%).

**Table 40**. Formal Financial Institutions that the Respondents Availed of Financial Services

| Financial Institutions | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Rural Banks | 6 (24.00) | 4 (28.57) | 16 (72.73) | 3 (60.00) | 29 (43.94) |
| CARD Lending | - | 4 (28.57) | 6 (27.27) | 2 (40.00) | 12 (18.18) |
| Armando Service | 3 (12.00) | - | - | - | 3 (4.54) |
| CART Lending | 3 (12.00) | - | - | - | 3 (4.54) |
| Paglaum | 2 (8.00) | - | - | - | 2 (3.03) |
| First Consolidated Bank | 2 (8.00) | - | - | - | 2 (3.03) |
| C&L Lending | - | 2 (14.29) | - | - | 2 (3.03) |
| Nickel Lending | - | 2 (14.29) | - | - | 2 (3.03) |
| Freewill | 1 (4.00) | - | - | - | 1 (1.52) |
| TSTI Kauswagan | 1 (4.00) | - | - | - | 1 (1.52) |
| MCB | 1 (4.00) | - | - | - | 1 (1.52) |
| Guiding Star | 1 (4.00) | - | - | - | 1 (1.52) |
| KTE | 1 (4.00) | - | - | - | 1 (1.52) |
| Bucana Finance | 1 (4.00) | - | - | - | 1 (1.52) |
| Reynaldo | 1 (4.00) | - | - | - | 1 (1.52) |
| Aguinaldo | 1 (4.00) | - | - | - | 1 (1.52) |
| Araw-araw | 1 (4.00) | - | - | - | 1 (1.52) |
| GA Lending | - | 1 (7.14) | - | - | 1 (1.52) |
| RTA | - | 1 (7.14) | - | - | 1 (1.52) |
| | 25 (100.00) | 14 (100.00) | 22 (100.00) | 5 (100.00) | 66 (100.04)* |

*Round-off error

## Satisfaction on Formal Financial Institutions

How satisfied the respondents were with the rural banks, lending agencies and commercial banks they use was determined by how they rated their operational features along loan requirements (e.g. collateral and documents needed to make loans), repayment procedures (e.g., schedule and mode), proximity (i.e. location), interest rates (i.e. if high or enough) and dealing with clients (i.e. whether very impersonal or not). The ratings of the respondents, however, seem to be largely uniform for the different operational features but varied according to the type of formal financial institutions and where the respondents were from. Therefore, the results should be interpreted with caution and be taken only as suggestive of how the respondents felt about how a specific institution operates as a whole.

Overall the respondents were generally "satisfied" (56.06%) with formal financial institutions and this holds true for all financial institutions and communities, except in Katipunan where all the respondents (100.00%) were less satisfied with the lending agencies. Across financial institutions, respondents were most satisfied with the rural banks (80.30%), followed by lending agencies (57.58%) and then commercial banks (30.30%). The lending agencies had the highest percentage of respondents who were less satisfied (28.79%) with their operational features, while the rural banks had the highest percentage of the respondents who were much satisfied (15.15%).

**Table 41.** Levels of Satisfaction on Operational Features of the Formal Financial Institutions

| Financial Institutions and Satisfaction | Dipolog (%) | Katipunan (%) | Manukan (%) | Total (%) |
|---|---|---|---|---|
| Rural Banks | | | | |
| Not Satisfied | - | - | - | - |
| Less Satisfied | 2 (8.00) | 1 (7.14) | - | 3 (4.55) |
| Satisfied | 21 (84.00) | 12 (85.71) | 15 (68.18) | 53 (80.30) |
| Much Satisfied | 2 (8.00) | 1 (7.14) | 7 (31.82) | 10 (15.15) |
| Very Much Satisfied | - | - | - | - |
| Total | 25 (100.00) | 14 (99.99)* | 22 (100.00) | 66 (100.00) |
| Lending Agencies | | | | |
| Not Satisfied | - | - | - | - |
| Less Satisfied | 4 (16.00) | 14 (100.00) | 1 (4.55) | 19 (28.79) |
| Satisfied | 20 (80.00) | - | 18 (81.82) | 38 (57.58) |
| Much Satisfied | 1 (4.00) | - | 2 (9.09) | 3 (4.54) |
| Very Much Satisfied | - | - | - | - |
| No Answer | - | - | 1 (4.55) | 6 (9.09) |
| Total | 25 (100.00) | 14 (100.00) | 22 (100.00) | 66 (100.00) |
| Commercial Banks | | | | |
| Not Satisfied | - | - | - | - |
| Less Satisfied | - | - | 1 (4.54) | 1 (1.52) |
| Satisfied | - | - | 20 (90.91) | 20 (30.30) |
| Much Satisfied | - | - | 1 (4.54) | 1 (1.52) |
| Very Much Satisfied | - | - | - | - |
| No Answer | 25 (100.00) | 14 (100.00) | - | 44 (66.66) |
| Total | 25 (100.00) | 14 (100.00) | 22 (99.99)* | 66 (100.00) |

*Round-off error

More than half of the respondents (58.11%) stated that they had attended trainings related to making loan applications, so they were more aware of their responsibilities. There are anecdotal reports about bad debts because most often the money borrowed was not used to satisfy its original intention. Repayment becomes a problem and borrowing has resulted in

more difficulties rather than a solution to check the worsening condition of poor fishing households, which was alleged to be due to the lack of capital. Considering the significant percentage of households surveyed that have attended lending training courses it is presumed that they have properly managed the money they borrowed from formal financial institutions. Attendance in the said training is highest in Katipunan (86.00%), compared to the other communities. No Manukan respondents reported attending any training course related to lending.

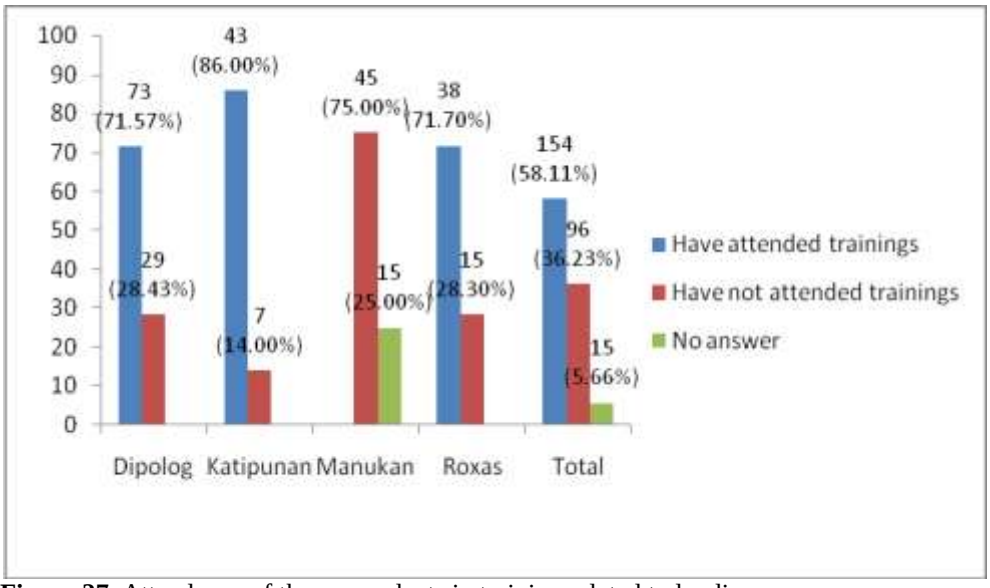


**Figure 27.** Attendance of the respondents in training related to lending.

## Satisfaction on Informal Financing Sectors

Money lenders, middle buyers, relatives and friends are the informal financing sectors which respondents reported they had used and who were available in their respective communities. Informal loans normally do not require collateral which is one key reason why many households use the informal financier sector rather than formal financial institutions, despite that the often higher interest rates. Relatives and friends may not charge interest. Fisher households however often have to sell their fish back to middle buyers, usually at less than the market price.

The respondents were asked to rate their satisfaction with the operational features of the informal financing sectors such as loan requirements, repayment procedures, proximity and interest rates, and the results show that they are generally "satisfied" with their relatives (100.00%) and friends (93.34%) and the middle buyers (63.64%), but "less satisfied" with the money lenders (61.54%). Again, similar to the way they rated the formal financial institutions, the trend shows that the rating given to one operational feature is largely the same across the informal financing sector. There are only minor rating differences and only in the case of the middle buyers where the rating of the majority of Dipolog respondents is "less satisfied" (56.00%). Nevertheless, overall 55% of all the respondents are "satisfied" with the informal financing sector actors.

**Table 42.** Levels of Satisfaction on Operational Features of Informal Financing Sectors

| Informal Sectors and Satisfaction Levels | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Money Lenders | | | | | |
| Not Satisfied | - | 1 (7.14) | - | - | 1 (2.56) |
| Less Satisfied | 12 (48.00) | 12 (85.72) | - | - | 24 (61.54) |
| Satisfied | 9 (36.00) | 1 (7.14) | - | - | 10 (25.64) |
| Much Satisfied | 4 (16.00) | - | - | - | 4 (10.26) |
| Very Much Satisfied | - | - | - | - | - |
| Total | 25 (100.00) | 14 (100.00) | | | 39 (100.00) |
| Middle Buyers | | | | | |
| Not Satisfied | - | - | - | - | - |
| Less Satisfied | 14 (56.00) | 1 (7.14) | - | - | 15 (34.09) |
| Satisfied | 10 (40.00) | 13 (92.80) | 5 (100.00) | - | 28 (63.64) |
| Much Satisfied | 1 (4.00) | - | - | - | 1 (2.27) |
| Very Much Satisfied | - | - | - | - | - |
| No Answer | - | - | - | - | - |
| Total | 25 (100.00) | 14 (100.00) | 5 (100.00) | - | 44 (100.00) |
| Relatives | | | | | |
| Not Satisfied | - | - | - | - | - |
| Less Satisfied | - | - | - | - | - |
| Satisfied | 25 (100.00) | 14 (100.00) | - | - | 39 (100.00) |
| Much Satisfied | - | - | - | - | - |
| Very Much Satisfied | - | - | - | - | - |
| No Answer | - | - | - | - | - |
| Total | 25 (100.00) | 14 (100.00) | - | - | 39 (100.00) |
| Friends | | | | | |
| Not Satisfied | - | - | - | - | - |
| Less Satisfied | 1 (4.00) | - | - | - | 1 (3.33) |
| Satisfied | 23 (92.00) | - | - | 5 (100.00) | 28 (93.34) |
| Much Satisfied | 1 (4.00) | - | - | - | 1 (3.33) |
| Very Much Satisfied | - | - | - | - | - |
| No Answer | - | - | - | - | - |
| Total | 25 (100.00) | - | - | 5 (100.00) | 30 (100.00) |

## Access of Wives to Financial Services

The level of financial transactions made by husbands and wives was examined in order to better understand the level of access women have to financial services. Overall financial services were assessed by the husband and wife together, by the wife alone and by the husband alone in 45%, 44% and by 11% of respondents respectively.

In Dipolog (52.00%), Manukan (48.00%) and Roxas (42.86%) husband and wife loans were prevalent and many banking institutions feel this mechanism is safer. Overall women and wives have good access to financial services and in many cases women/wives are more involved in financial transactions than men/husbands, though this is probably with their consultation and agreement.

**Table 43.** Household Members Who Accessed Financial Services (Multiple Responses)

| Persons Involved | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Husband only | 2 (8.00) | 2 (14.29) | 2 (36.00) | 2 (28.57) | 8 (11.27) |
| Wife only | 10 (40.00) | 8 (57.14) | 11 (44.00) | 2 (28.57) | 31 (43.66) |
| Both husband and wife | 13 (52.00) | 4 (28.57) | 12 (48.00) | 3 (42.86) | 32 (45.07) |
| Total | 25 (100.00) | 14 (100.00) | 25 (100.00) | 7 (100.00) | 71 (100.00) |

## Suggestions for Improving Financing

***Lender-fisher relationships.*** Lending is a business and future transactions become possible when past transactions were economically beneficial to both parties. The respondents were asked to suggest how to improve the lending relationships between fishers and micro-finance institutions, both the formal and informal. The majority (69.43%) of all respondents suggested that fishers have to be good borrowers, i.e. they should repay as scheduled. Their ability to repay gives them an element of trust in the eyes of the financial institution, so that next time they apply for a loan it is more likely to be granted.

In order for the financing institutions or individuals to keep a good number of clients or borrowers, the respondents made the following suggestions: offering low interest rate (17.36%) and being considerate of the borrower (13.21%). Although these were only suggested by Katipunan and Roxas respondents respectively, these are significant for lending institutions. The lending business will only thrive if the people taking loans are successful in investing the money borrowed, so that they can make timely repayment. This will allow more money to be borrowed and invested in more livelihoods projects.

**Table 44.** Suggestions to Improve the Lending Relationships

| Suggestions | Dipolog (%) | Katipunan (%) | Manukan (%) | Roxas (%) | Total (%) |
|---|---|---|---|---|---|
| Good ability to pay | 102 (100.00) | 4 (8.00) | 53 (100.00) | 25 (41.67) | 184 (69.43) |
| Offering low interest rate | - | 46 (92.00) | - | - | 46 (17.36) |
| Being considerate to the borrower | - | - | - | 35 (58.33) | 35 (13.21) |
| Total | 102 (100.00) | 50 (100.00) | 53 (100.00) | 60 (100.00) | 265 (100.00) |

***Resource pooling.*** Aside from being dependent on financial institutions and other actors within the financial sector to start an enterprise, the respondents were also asked to suggest other ways by which they can generate or pool capital as a group. They had varied suggestions, but the majority agreed to pool their resources together to establish a cooperative and to engage in productive ventures (37.74%) which are also reflected in the suggestion of some to go into rotating savings (33.58%). The third suggestion is to engage in livelihood projects (24.91%) linked to the formation of cooperatives.

Forming a cooperative is the top suggestions of Katipunan respondents (46.00%), while practicing rotating saving is number one to Dipolog respondents (40.20%) and Roxas (40.00%). Only Manukan respondents identified the establishment of a livelihoods project (37.74%) as their priority. The remaining problem is how such groups can start such a venture given their poor ability to raise the necessary start-up funds. Incidentally, none of the

respondents have previously received a subsidy or loan from the government and their suggestion to pool their resources illustrates how they can best actually initiate their own financing mechanisms. This is where technical support from outside is needed.

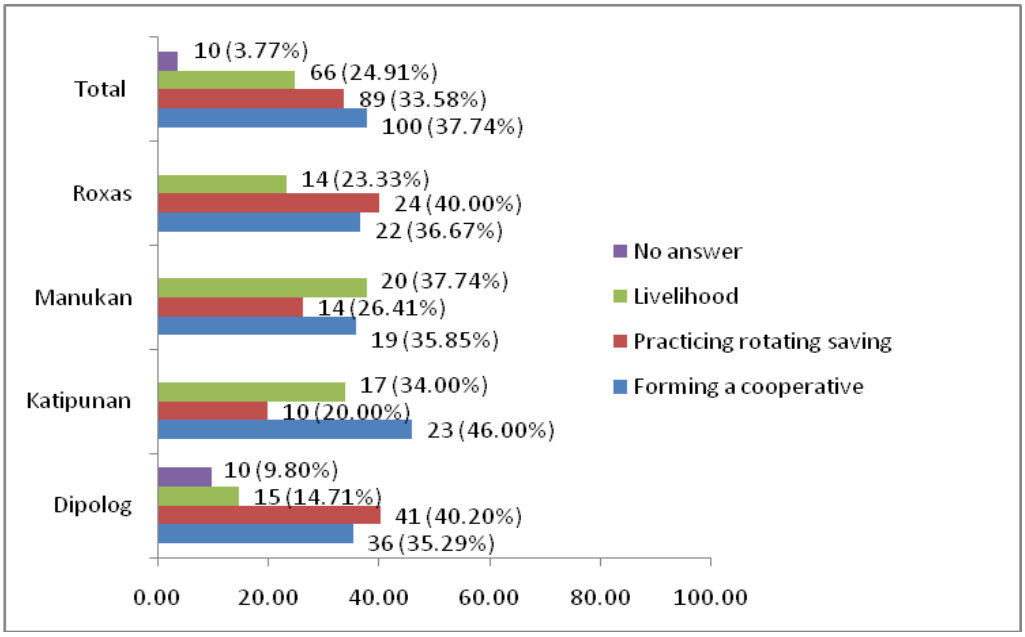


**Figure 28.** Suggestions where and how the community can save and benefit together.

## Summary

The majority of all the respondents considered that the livelihoods opportunities at present were less diverse than those likely to be available in the future, which suggests that they perceived their current economic condition is less than satisfactory but they had optimistic hopes for a better future. Although the majority of respondents from Dipolog, Katipunan and Mannukan were interested in changing their livelihoods, all Roxas respondents wanted to continue fishing. Livelihoods training and skills provided by local government units and non-government organizations will only help trainees to engage in alternative livelihoods if they have, or can assess the necessary capital to invest.

Micro-financing can enhance capacity to earn and to better manage better economic risks amidst uncertainties in the fishing industry. But only one-fourth of the households surveyed had used the services of financing institutions like banks and lending agencies at the project sites. Among those who had used formal financial services, the wives were more often involved than husbands, though this is probably with their consultation and agreement.

Respondent households that had used formal financial services are generally "satisfied" with the operational features of banks and lending agencies in terms of loan requirements, repayment procedures, proximity, interest rates and dealing with clients. This suggests that there are some areas in each of these operational features that should be improved for the clients. Various informal financing sector actors are used by the respondents including money lenders, middle buyers, relatives and friends, but unlike the formal financial institutions, informal financial sector actors only offer loan services. The respondents are "satisfied" with the middle buyers, relatives and friends, but are "less satisfied" with the money lenders.

None of the respondent households had received a government subsidy so there is really a need for them to maintain good lender-fisher relationships to have financial services (loans) in times of need. Timely repayment of loans was cited by fisher households as the way to maintain a good credit line or record with financial institutions, both formal and informal. To the financial institutions, the respondents suggested that they offer lower interest rates and to be more considerate with their clients. Meanwhile, forming cooperatives, to practice rotating savings and to engage in livelihood projects were suggested as ways to maintain financial stability of households.

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# APPENDICES

**Appendix 1**. List of Coral Genera in Poblacion, Manukan and Linay, Zamboanga del Norte

| | **Scientific Name** | **Linay** | **Dequis** |
|---|---|---|---|
| | Hard Corals | | |
| | ORDER SCLERACTINIA: FAMILY ACROPORIDAE | | |
| 1. | *Acropora* sp (tabulate) | x | |
| 2. | *Acropora* sp (encrusting) | x | |
| | FAMILY AGARICIIDAE | | |
| 3. | *Pavona* sp | x | |
| | FAMILY FAVIIDAE | | |
| 4. | *Favia* sp | x | X |
| 5. | *Favites* sp | x | X |
| 6. | *Montastrea* sp | | X |
| | FAMILY FUNGIIDAE | | |
| 6. | *Fungia* sp | x | |
| | FAMILY OCULINIDAE | | |
| 7. | *Galaxea* sp | x | |
| | FAMILY POCILLOPORIDAE | | |
| 8. | *Pocillopora* sp | x | |
| | FAMILY MUSSIDAE | | |
| 9. | *Lobophyllia* sp | x | |
| | FAMILY PECTINIIDAE | | |
| 10. | *Pectinia* sp | x | |
| | FAMILY PORITIDAE | | |
| *11.* | *Porites* (massive) | x | |

**Appendix 2.** Fishing Gear with Fish Catch (kg) in One Month (December 2010) in Dipolog Bay

| Fishing Gear | | Dipolog | | Katipunan | | Roxas | | Manukan | |
|---|---|---|---|---|---|---|---|---|---|
| Common Name | Local Name | Fish Catch | Weight (kg) | Fish Catch | Weight (kg) | Fish Catch | Weight (kg) | Fish Catch | Weight (kg) |
| Beach Seine | Bira-Bira/ Baling | Bilong-bilong | 13.75 | | | Sigarilyo | 135 | Tabangko | 10 |
| | | Lintoy | 8 | | | Flying Fish | 64 | Malitubong | 36 |
| | | Liplipan | 20 | | | | | Malangsi | 15 |
| | | Malangse | 1 | | | | | Andohaw | 10 |
| | | Mudlong | 8.50 | | | | | | |
| | | Sepi-sepi | 107.5 | | | | | | |
| | | | (158.75) | | | | (199) | | (71) |
| Surface Set Longline | Pakaras | Anduhaw | 3 | | | Katambak | 23 | | |
| | | Mudlong | 4 | | | Lawayan | 12 | | |
| | | Sambagon | 125 | | | Malasugi | 53 | | |
| | | Tuna | 82 | | | Pandawan | 34 | | |
| | | | | | | Tarugho | 43 | | |
| | | | (214) | | | | (165) | | |
| Surface Set Gillnet | Patuloy/ Pamo | Anduhaw | 7 | Aso os | 2 | Toloy | 235 | Mudlos | 1.40 |
| | | Bolinaw | 144 | Bantaan | 12 | | | Anduhaw | 20.5 |
| | | Borotborot | 7 | Barla | 4 | | | Bakagan | 21 |
| | | Hiloshilos | 3 | Bulinao | 2 | | | Dapak | 14 |
| | | Lupoy | 48 | Diwit | 7 | | | Malitubong | 0.20 |
| | | Malangse | 20 | Gisaw | 3 | | | Mudlong | 12 |
| | | Mnulsog | 3 | Ikyang | 2 | | | Salay-salay | 1 |
| | | Sepi-sepi | 3 | Lagaw | 3 | | | Tabilos | 0.50 |
| | | Sigarilyo | 7 | Lalagan | 2 | | | | |
| | | Tabangko | 3 | Lambay | 2 | | | | |
| | | Tuloy | 53 | Malangse | 12 | | | | |
| | | | | Mangse | 15 | | | | |
| | | | | Modlong | 15 | | | | |
| | | | | Pasayan | 1 | | | | |
| | | | | Pulag-ikog | 2 | | | | |
| | | | | Sipi | 3 | | | | |
| | | | | Tabilos | 2 | | | | |
| | | | | Tuloy | 106 | | | | |
| | | | (298) | | (195) | | (235) | | (70.6) |
| Fish Pot | Coralon | | | Pasayan | (8.5) | | | | |
| Drift Gillnet | Kurantay | | | Pirit | 90 | Balo | 200 | | |
| | | | | Modlong | 10 | Danggit | 5 | | |
| | | | | | | Kitong | 1 | | |
| | | | | | | Kubutan | 3 | | |
| | | | | | | Modlong | 280 | | |
| | | | | | | Molmol | 3 | | |
| | | | | | | Octupos | 2 | | |
| | | | | | | Tuna | 53 | | |
| | | | | | (100) | | (547) | | |
| Encircling Gillnet | Likos | | | Bilong-bilong | (225) | | | | |

Note: Figures inside parentheses refer to column total per cell.

**Appendix 2**. Fishing Gear… *continued*

| Fishing Gear | | Dipolog | | Katipunan | | Roxas | | Manukan | |
|---|---|---|---|---|---|---|---|---|---|
| Common Name | Local Name | Fish Catch | Weight (kg) | Fish Catch | Weight (kg) | Fish Catch | Weight (kg) | Fish Catch | Weight (kg) |
| Bottom Set Longline | Palangre | | | Anduhao | 5 | | | Lapis | 1.90 |
| | | | | Bantaan | 1.25 | | | Banagan | 0.80 |
| | | | | Bolinao | 0.75 | | | Calacas | 1 |
| | | | | Diwit | 52.7 | | | Dapak | 5.50 |
| | | | | Ikyang | 10 | | | Hagumaa | 3.50 |
| | | | | Lagaw | 34 | | | Lagaw | 22.85 |
| | | | | Malangase | 4 | | | Lalagan | 1 |
| | | | | Mangse | 37.25 | | | Lapis | 9.00 |
| | | | | Modlong | 31 | | | Magumaa | 1.00 |
| | | | | Palutpot | 5 | | | | |
| | | | | Pulag ikog | 3.5 | | | | |
| | | | | Sarisari | 8 | | | | |
| | | | | Sipisipi | 37.85 | | | | |
| | | | | Tuloy | 20 | | | | |
| | | | | Ubod | 5 | | | | |
| | | | | | (255.3) | | | | (46.55) |
| Bottom Set Gillnet | Palung--dang | | | Anduhao | 5 | Kubutan | 15 | Tamarong | 30 |
| | | | | Pulag ikog | 6 | Balawis | 35 | | |
| | | | | Pirit | 15 | | (50) | | (30) |
| | | | | | (26) | | | | |
| Hook and Line | Tonton/ Pasul | | | Diwitdiwit | 5 | | | Abngan | 6.50 |
| | | | | | | | | Baolo | 2.90 |
| | | | | | | | | Diwit | 109.8 |
| | | | | | | | | Bilong-bilong | 5.00 |
| | | | | | | | | Bolinaw | 2.90 |
| | | | | | | | | Dalopapa | 11.00 |
| | | | | | | | | Hagumaa | 12.5 |
| | | | | | | | | Kugita | 17.00 |
| | | | | | | | | Kulabotan | 5.30 |
| | | | | | | | | Lagaw | 9 |
| | | | | | | | | Langgisan | 10.50 |
| | | | | | | | | Lapis | 6.20 |
| | | | | | | | | Liplipan | 8.00 |
| | | | | | | | | Magumaa | 5 |
| | | | | | | | | Mudlong | 11.00 |
| | | | | | | | | Mudlos | 27.15 |
| | | | | | | | | Pandawan | 9.10 |
| | | | | | | | | Sambagon | 93.90 |
| | | | | | | | | Samin-samin | 4.50 |
| | | | | | | | | Sipi-sipi | 17.85 |
| | | | | | | | | Tamarong | 92.05 |
| | | | | | (5) | | | | (467.15) |
| Bottom Set Surface Set Longline | Panalat/ Pakatay | | | | | Ahaan | 8 | | |
| | | | | | | Baja ulo | 20 | | |
| | | | | | | Lawing | 18 | | |
| | | | | | | Pinyahon | 41 | | |
| | | | | | | Pogapo | 15 | | |
| | | | | | | Saminsamin | 21 | | |
| | | | | | | Tabangko | 32 | | |
| | | | | | | Tuna | 45 | | |
| | | | | | | | (200) | | |

**Appendix 3.** Relative Abundance of Fish Species Caught in Dipolog Bay.

| Scientific Name | Common Name | Local Name | Relative Abundance | | | |
|---|---|---|---|---|---|---|
| | | | Dapitan | Katipunan | Manukan | Roxas |
| **BELONIDAE** | | | | | | |
| *Strongylura stronglura* | Spottail needlefish | Balo | | | | 14.33 |
| **CARANGIDAE** | | | | | | |
| *Alectis indica* | Threadfin Trevally | Lawing | | | | 1.29 |
| *Alepes* spp1 | Small mouth scad | Hagumaa | | | 2.33 | |
| *Alepes* spp2 | Trevally scad | Kalakas | | | 0.15 | |
| *Alepes djedaba* | Shrimp scad | Tamarong | | | 17.8 | |
| *A. melanoptera* | Blackfin scad | Sipi-sipi | 16.01 | 5.02 | 2.61 | |
| *Caranx sexfasciatus* | Bluefin trevally | Baulo | | | 0.42 | |
| *Decapterus russelli* | Indian Scad | Bodlong | | 1.23 | | |
| *D. macarellus* | Mackerel Scad | Burot-Burot | 1.02 | | | |
| *D. tabl* | Roughear Scad | Pulag-ikog | | 1.41 | | |
| *Selar crumenopthalmus* | Big-Eyed Scad | Modlong | 1.82 | 5.63 | 3.36 | 20.06 |
| *Scomberoides* spp | queenfish | Lapis | 2.91 | | 2.49 | |
| *Selaroides leptolesis* | Yellow stripe scad | Salay-Salay | | | 0.15 | |
| **CLUEPEIDAE** | | | | | | |
| *Drussumieria acuta* | Rainbow sardine | Hilos-hilos | 0.44 | | | |
| *Sardinella gibbosa* | Gold strip sardinella | Malangsi | 3.06 | 8.4 | 2.19 | |
| *S. lemuru* | Indian oil sardine | Tuloy | 7.71 | 15.5 | | 16.83 |
| *Sardinella* spp | Sardine juveniles | Lupoy | 6.98 | | | |
| **CORYPHAENIDAE** | | | | | | |
| *Coryphaena hippurus* | Common Dolphin Fish | Pandawan | | | | 2.44 |
| ENGRAULIDAE | | | | | | |
| *Stolephorus sp* | Ronquillos anchovy | Bolinaw | 20.95 | 0.39 | 0.42 | |
| **EXOCOETIDAE** | | | | | | |
| *Cheilopogon unicolor* | Spotfin flyingfish | Bangsi | | | | 4.58 |
| **ISTRIOPHORIDAE** | | | | | | |
| *Makaira indica* | Black Marlin | Tarugho | | | | 3.08 |
| *M. mazara* | Indo-pacific blue marlin | Malasugi | | | | 3.8 |
| **LEIOGNATIDAE** | | | | | | |
| *Leiognathus elongatus* | Small toothed pony fish | Tabilos | | 0.25 | | 0.07 |
| *L. equulus* | Common Ponyfish | Lawayan, Danglay | | | | 0.86 |
| *Leiognathus* spp1 | ponyfish | Palotpot, Bakagan | | 0.61 | | |
| *Leiognathus* spp2 | Slipmouth | Sapsap | | | | |
| | | | | | | |
| **LETHRINIDAE** | | | | | | |
| *Lethrinus* spp | Spangled emperor | Katambak | | | | 1.65 |
| *Gymnocranius griseus* | Grey larg-eye bream | Bag-angan | | | 0.95 | |

**Appendix 3. continued…..**

| Scientific Name | Common Name | Local Name | Relative Abundance | | | |
|---|---|---|---|---|---|---|
| | | | Dapitan | Katipunan | Manukan | Roxas |
| **LUTJANIDAE** | | | | | | |
| *Lutjanus bohar* | White-spotted Red Snapper | Ahaan | | | | 0.57 |
| *L. gibbus* | Humpback snapper | Dapak | | | 2.85 | |
| *L. spirulus* | Five-Lined Snapper | Lalagan | | 0.25 | | |
| **MENIDAE** | | | | | | |
| *Mene maculata* | Moonfish | Belong Belong | 2 | 27.16 | 0.73 | |
| **MUNGILIDAE** | | | | | | |
| *Valamugil engeli* | Kanda | Gisaw | | 0.37 | | |
| **MULLIDAE** | | | | | | |
| *Upeneus vittatus* | Yellowstriped goatfish | Malitubong | | | 5.28 | |
| **MURAENESOCIDAE** | | | | | | |
| *Congresox talabon* | Yellow pike conger | Ubod | | 0.61 | | |
| **MYLIOBATIDAE** | | | | | | |
| *Rhynoptera javanica* | Cow-nosed Ray | Banugan | | | 0.12 | |
| **NEMIPTERIDAE** | | | | | | |
| *Scolopsis auratus* | Yellowstriped monocle bream | Baha-ulo | | | 0.42 | |
| *Nemipterus isacanthus* | Teardrop threadfin | Lagaw | | 4.55 | 4.65 | |
| **PRIACANTHIDAE** | | | | | | |
| *Priacanthus tayenus* | Spotted-fin Big-eye | Ikyang | | 1.48 | | |
| **SCARIDAE** | | | | | | |
| *Calotomus spinidens* | Parrotfish | Molmol | | | | 0.21 |
| **SCATOPHAGIDAE** | | | | | | |
| *Scatophagus argus* | Spotted scat | Kitong | | | | 0.07 |
| **SCOMBRIDAE** | | | | | | |
| *Rastrelliger brachysoma* | Short mackerel | Anduhaw | 1.46 | 1.23 | 4.45 | |
| *Thunnus albacares* | Yellow fin Tuna juvenile | Bangkoy | 11.93 | | | 7.02 |
| *Auxis rochei* | Bullet Tuna juvenile | Lintoy, Bantaan | | 1.64 | | |
| *Scomberomus commerson* | Narrow-barred Spanish mackerel | Pinyahon | | | | 2.94 |
| *Auxis thazard* | Frigate tuna | Pirit | | 12.91 | | |
| *Katsuworus pelanes* | Skipjack tuna juvenile | Sambag-sambag | | | | |
| *Katsuworus pelanes* | Skipjack tuna | Sambagon | 18.19 | | 13.7 | |
| **SILLAGINIDAE** | | | | | | |
| *Sillago maculata* | Northern whiting | Asoos | | 0.25 | | |
| **SIGANIDAE** | | | | | | |
| *Siganus corallinus* | Rabbitfish | Balawis | | | | 2.51 |

**Appendix 3. continued…..**

| Scientific Name | Common Name | Local Name | Relative Abundance | | | |
|---|---|---|---|---|---|---|
| | | | Dapitan | Katipunan | Manukan | Roxas |
| *Siganus gluttatus* | Rabbitfish | Danggit | | | | 0.36 |
| *Ravangnida uii* | Coastal trevally | Samin-samin | | | 1.5 | 0.66 |
| **SERRANIDAE** | | | | | | |
| *Epinephelus* spp | | Pugapo | | | | 1.07 |
| **SPHYRAENIDAE** | | | | | | |
| *Sphyraena* spp | Barracuda | Tabangko, Rumpi | 0.44 | | 1.46 | 2.2 |
| *Trichiurus lepturus* | | Diwit | | 7.81 | | |
| **Invertebrates** | | | | | | |
| **LOLIGONIDAE** | | | | | | |
| *Loligo* spp1 | Squid | Nukos | | | | |
| *Loligo* spp2 | Giant squid | Dalupap | | | 1.6 | |
| **OCTOPODIDAE** | | | | | | |
| *Octopus* spp | Octopus | Kugita | | | | 0.14 |
| **SEPIIDAE** | | | | | | |
| *Sepia* spp | Cuttlefish | Kubutan | | | | 1.29 |
| **PORTUNIDAE** | | | | | | |
| *Portunus pelagicus* | Blue Crab | Lambay | | 0.25 | | |
| | | | | | | |

**Appendix 4.** Catch Per Unit Effort (Kg/man-hr) Per Fishing Gear in Dipolog Bay.

| Fishing Gear | | Dipolog | | Katipunan | | Roxas | | Manukan | |
|---|---|---|---|---|---|---|---|---|---|
| Common Name | Local | # of Units | Mean | # of Units | Mean | # of Units | Mean | # of Units | Mean |
| Beach Seine | Bira-Bira/ Baling | 40 | 0.88 ±0.62 | | | 3 | 2.41 ±0.71 | 4 | 1.90 ±0.77 |
| Fish Corral | Bungsod | 1 | 6.67 ±0.01 | | | | | | |
| Surface Set Longline | Pakaras | 6 | 3.44 ±2.86 | | | 5 | 2.37 ±0.43 | | |
| Surface Set Gillnet | Patuloy/ pamo | 34 | 2.06 ±2.08 | 11 | 3.52 ±2.24 | 2 | 2.03 ±0.66 | 5 | 1.26 ±1.10 |
| Fish Pot | Coralon | | | 8 | 0.47 ±0.16 | | | | |
| Drift Gillnet | Kurantay | | | 1 | 3.33 ±0.01 | 4 | 1.94 ±0.58 | | |
| Encircling Gillnet | LikosLikos | | | 4 | 0.95 ±0.32 | | | | |
| Bottom Set Longline | Palangre | | | 29 | 3.51 ±3.39 | | | 13 | 1.53 ±1.04 |
| Bottom Set Gillnet | Palungdang | | | 4 | 2.06 ±1.56 | 2 | 1.2 ±0.37 | 1 | 1.25 ±0.01 |
| Hook and Line | Tonton/ Pasul | | | 1 | 0.50 ±0.01 | | | 55 | 1.07 ±0.76 |
| Bottom set - Surface Set Longline | Panalat/ Pakatay | | | | | 7 | 2.22 ±0.53 | | |

**Appendix 5.** Household Survey Form



## BASELINE STUDY FOR THE REGIONAL FISHERIES LIVELIHOODS PROGRAMME IN THE PROVINCE OF ZAMBOANGA DEL NORTE, PHILIPPINES

Dear Sir/Madam:

Good _____. I am _____ from Jose Rizal Memorial State University who is assisting the conduct of the baseline study for the regional fisheries livelihood programme in the province of Zamboanga del Norte. This study intends to find out the conditions of fishing households and their livelihood activities in relation to existing fishery resources and other economic opportunities. You are randomly chosen as one of the respondents and I hope that you can share some of your time for the interview. Rest assured that the information you will provide will be treated with utmost confidentiality and be used only for the purpose of this study. Thank you.

Name of Respondent _____ (INCLUDE ONLY HOUSEHOLDS WHICH HAS MEMBERS WHO ARE INTO FISHING)

Interviewer _____ Date _____ Time Interview Starts _____ Time Interview Ends _____

Edited by _____ Date _____ Encoded by_____ Date _____

**1.00. CONTEXTUAL INFORMATION**

1.01. Household Number _____ 1.02. Barangay _____ 1.03. Municipality _____

**2.00. HOUSEHOLD PROFILE**

2.01. (WRITE FIRST THE NAME OF THE RESPONDENT IN THE TABLE BELOW THEN PROCEED ASKING THE SUCCEEDING QUESTIONS FOR THE RESPONDENT AND THE OTHER HOUSEHOLD MEMBERS) Please enumerate the members of your household and provide the following information *(Palihug isulti ang mga miyembro sa imong banay karon ug ihatag ang mga mosunod nga inpormasyon:)* (HOUSEHOLD MEMBERS INCLUDE ANYONE, RELATED OR NOT, LIVING TOGETHER WITH THE RESPONDENT DURING THE PAST 12 MONTHS)

2.02. Relationship of this member to you *(Relasyon nimo?)*,. 2.03. Sex *(Seks)*, 2.04. Age *(Edad)*, 2.05. Highest education attained *Natapos sa pageskuwela)* (SPECIFIC LEVEL), 2.06. Primary occupation *(Primerong trabaho)*, 2.07. Estimated monthly income *(Kita kada bulan)*, 2.08. Other occupations *(Lain pang trabaho)*, 2.09. Estimated monthly income *(Kita kada bulan)*. (ENTER RESPONSE INTO THE TABLE)

| 2.01 Household Members (Size) | 2.02 Relationship to Respondent* | 2.03 Sex | 2.04 Age | 2.05 Highest Education | 2.06 Primary Occupation** | 2.07 Estimated Monthly Income | 2.08 Other Occupations** | 2.09 Estimated Monthly Income |
|---|---|---|---|---|---|---|---|---|
| 1. | Respondent | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |
| 6. | | | | | | | | |
| 7. | | | | | | | | |

*Question 2.02 will tell the household type:
1 Nuclear (father, mother and married children)
2 Extended (nuclear plus other related and unrelated members)

**Questions 2.06-2.09 will tell the following:
a. Number of household members by sex who are into fishing:
Male _____ Female _____
b. Number of livelihood activities found in the household:
Male _____ Female _____

2.10. What is your household's religion? *(Unsa ang relihiyon sa imong banay?)*_____

| | | | |
|---|---|---|---|
| 1 | Roman Catholic | 4 | United Church of Christ in the Philippines |
| 2 | Iglesia ni Cristo | 5 | Seventh Day Adventist |
| 3 | Islam | 6 | Others (SPECIFY) _____ |

2.11. What is the primary dialect spoken in your household? *(Unsa ang primirong pinulungan nga gigamit sa inyong banay?)*

| | | | |
|---|---|---|---|
| 1 | Cebuano | 4 | Ilonggo |
| 2 | Tagalog | 5 | Chavacano |
| 3 | Tausog | 6 | Others (SPECIFY) _____ |

2.12. Since your household was established, how many years have you been living in this community?*(Gikan sa nagminyo na mo, pila na katuig nga gapuyo kamo dinhi?)* _____ years

2.13. Had your household transferred residence or migrated? *(Nakabalhin ba kamo og lugar nga inyong gipuy-an?)*

1 Yes 2 No

2.14. (IF YES) How many times had your household transferred residence? *Kapila na ang imong banay nakabalhin og puluy-anan sa ubang lugar?)*_____

2.15. (IF YES) (Where did your household first reside? *(Asa man nagpuyo ang imong banay nia tong una?)*

1 In another barangay of the town you are now residing *(Sa ubang barangay sa lungsod)*
2 In another town of the province you are now residing *(Sa ubang lungsod sa probinsiy)*
3 In another province *(Sa ubang probinsiya)*
4 In another region *(Sa ubang rehiyon)*

2.16. Why did your household transfer residence? (ALLOW MULTIPLE RESPONSE) *(Ngano man ang imong banay nagbalhin ug puluy-anan?)*

1 Peace and order situation *( problema sa kalinaw ug kahusay)*
2 Economic opportunities *(opportunidad para sa ekonomikanhong paglambo)*
3 Education of children *(opportunidad sa edukasyon sa mga bata)*
4 To be together with relatives *(para makauban ang mga paryentes)*
5 Others (SPECIFY) _____

2.17. Does your household own a farmland? *(Ana-a bay uma ang imong banay?)*

1 Yes 2 No (SKIP TO Q2.22)

2.18. (IF YES) How many hectares of farmland does your household own? *Pila man ka ektarya ang uma sa imong banay?*_____

2.19. How does your household acquire/own the farmland? *(Sa unsang paagi naka-panag-iya og uma ang imong banay?*

| | | | |
|---|---|---|---|
| 1 | Bought *(pinalit)* | 4 | Inherited from parents *(kabilin sa mga ginikanan)* |
| 2 | Rented *(gi-abangan)* | 5 | Tenanted *(gi-saupan)* |
| 3 | Given free use *(gipapuyo'g libre* | 6 | Others (SPECIFY) _____ |

2.20. What crops do you raise in your farmland? *(Unsa ang mga tanom sa imong uma?*(ALLOW MULTIPLE RESPONSES)

| | | | |
|---|---|---|---|
| 0 | Not planted *(wala tanumi)* | 4 | Rootcrops *(lagutmon)* |
| 1 | Corn *(mais)* | 5 | Fruit trees *(kahoy nga prutas)* |
| 2 | Rice *(humay)* | 6 | Others (SPECIFY) _____ |
| 3 | Coconut *(lubi)* | | |

2.21. Do you own your house? *(Gipanag-iya ba ninyo ang inyong balay?)*

1 Yes 2 No

2.22. (IF NO) How do you gain access to this house?

| | | | |
|---|---|---|---|
| 1 | Rented *(giabangan)* | 3 | Inherited from parents *(kabilin sa mga ginikanan)* |
| 2 | Free use *(gipapuy-an libre)* | 4 | Others (SPECIFY) _____ |

2.23. JUST OBSERVED WHAT CONSTITUTE THE ROOF OF THE HOUSE

1 Light materials (nipa shingles or cogon) *(nipa o cogon)*
2 Galvanized iron *(sin)*

3 Combination of nipa shingles and galvanized iron *(kombinasyun sa nipa ug sin)*
4 Others (SPECIFY) _____

2.24. What is your source of drinking water at home? *(Unsa ang inyong giku-haan para sa inyong tubig sa balay?)* (ALLOW MULTIPLE RESPONSE)

| | | | |
|---|---|---|---|
| 1 | Spring *(tubod)* | 5 | Communal deep well *(komon na balon)* |
| 2 | Open well *(atabay)* | 6 | Owned faucet *(kaugalingong linya sa gripo)* |
| 3 | Artesian or deep well *(artesyan)* | 7 | Communal faucet *(komon nga linya sa gripo)* |
| 4 | Jetmatic or shallow well *(bomba)* | 8 | Others (SPECIFY) _____ |

2.25. What type of toilet do you have at home? *(Unsang klase ang inyo kalibangan sa inyo balay?)*

| | | | |
|---|---|---|---|
| 0 | None *(walay kalibangan)* | 3 | Flush type water sealed *(inuduro)* |
| 1 | Antipolo type *(antipolo)* | 4 | Others (SPECIFY) _____ |
| 2 | Manual water sealed *(buhos nga nay tangke)* | | |

2.26. (IF NONE) Where do the members of your family go to move bowel? (*Asa man malibang and miembro sa imong pamilya?)*

| | | | |
|---|---|---|---|
| 1 | Communal toilet *(komon nga kalibanagan)* | 4 | River banks *(sa daplin sa baybay sa suba)* |
| 2 | Neighbor's toilet *(kalibanagan sa silingan)* | 5 | Shoreline *(sa daplin sa baybay sa dagat)* |
| 3 | Relative's toilet *(kalibangan sa paryente)* | 6 | Others (SPECIFY) _____ |

2.27. What is the type of lighting facility do you have at home? *(Unsang klase ang inyong gigamit nga suga sa inyong balay?)*

1 Kerosene lamp *(lamparilya gamit ang gaas)*
2 Petromax *(petromax)*
3 Electricity *(kuryente)*
4 Others (SPECIFY) _____

2.28. What do you use as fuel in cooking at home? *(Unsa ang inyong gigamit na pang-bula-eg sa imong pagluto?)* (ALLOW MULTIPLE RESPONSES)

1 Firewood *(kahoy na binugha)*
2 Sawdust *(sodas)*
3 Charcoal *(uling)*
4 Liquified petroleum gas (LPG) *(gasul)*
5 Others (SPECIFY) _____

2.29. What electronic equipments do you own at home? *(Unsang de-koryenteng kahimanan ang imong gipanag-iya sa balay?)*

| | | | |
|---|---|---|---|
| 1 | Transistor radio *(radyo)* | 6 | Cassette recorder *(kaset)* |
| 2 | CD/DVD music player | 7 | CD/DVD video player |
| 3 | Cellphone | 8 | Telephone |
| 4 | Television (antennae) | 9 | Cable television |
| 5 | Personal computer | 10 | Internet connection |
| | | 11 | Others (SPECIFY) _____ |

2.30. What vehicular facilities do you own at home? *(Unsa inyong salakyan na imong gipanag-iya?)*

| | | | |
|---|---|---|---|
| 1 | Bicycle *(bisikleta)* | 4 | Motorcycle *(motor)* |
| 2 | Multicab *(jeep-easyride)* | 5 | Others (SPECIFY) _____ |
| 3 | Automobile *(awto)* | | |

**3.00. FISHERIES CO-MANAGEMENT ISSUES**

3.01. Please indicate if a specific function in fisheries management is a responsibility only of government officials, fishers' associations or women's groups or a shared responsibility by two or all the three *(Palihug isulti kun ang mosunod nga kalihokan sa pagdumala sa pangisdaan iya lamang sa mga opisyales sa gobyerno, kapunungan sa mga mangingisda, mga kababayen-an o kumbinasyon nila)*. (READ ALL THE FUNCTIONS BELOW AND ENCIRCLE THE CODE UNDER APPROPRIATE CELL CORRESPONDING TO THE ANSWERS OF THE RESPONDENTS. ALLOW MULTIPLE RESPONSES. IT IS POSSIBLE THAT ALL THE GROUPS WILL BE ANSWERED. SEE EXAMPLE BELOW.)

| Understanding of Co-management Concept and Expectations | Government Officials | Fishers' Associations | Women's Groups |
|---|---|---|---|
| Enforcement of fishery laws and regulations | 1 | 2 | 3 |

| Understanding of Co-management Concept and Expectations | Government Officials | Fishers' Associations | Women's Groups |
|---|---|---|---|
| a. Formulation of polices, laws and regulations to manage fisheries | 1 | 2 | 3 |
| b. Enforcement of fishery laws and regulations | 1 | 2 | 3 |
| c. Compliance of fishery laws and regulations | 1 | 2 | 3 |
| d. Study of the conditions and problems of fishery resources | 1 | 2 | 3 |
| e. Monitoring and assessment of the status of fishery resources | 1 | 2 | 3 |
| f.. Planning in the management of fishery resources | 1 | 2 | 3 |
| g. Dissemination of information about matters related to fisheries | 1 | 2 | 3 |

3.02. Which of the following statement do you agree most? *(Asa sa mga mosunod nga panultihon nga mouyon ka?)* (ALLOW ONLY ONE ANSWER)

1 Fishery resources should be open to all and not regulated because these are God given (open-access regime) *(Ang kaisda-an dapat para sa tanan ug dili limitahan ang pagkuha niini tungod kay hinatag kini sa Ginoo)*

2 The government can regulate the use of fishery resources because it has authority over it (centralized regime) *(Ang pagkuha sa kaisda-an dapat limitahan sa gobyerno tungod kay anaa kini gahom kabahin niini)*

3 The use and management of fishery resources should be a joint effort of the government and the local community (co-management regime) *Ang pagkuha ug pagdumala sa kaisda-an dapat tambayayongan o tabangan sa gobyerno ug mga local nga mga molupyo)*

4 None of the above (ASK FOR ALTERNATIVE IDEAS) _____

3.03. Which of the following statement do you agree most? *(Asa sa mga mosunod nga panultihon nga mouyon ka?)* (ALLOW ONLY ONE ANSWER)

1 Any conflict around fishery resources will just die out as time passes by without any settling mechanisms *(Bisag unsa nga away tungod sa kaisda-an mohupay lamang sa paglabay sa panahon bisag dili kini pangitaan og pa-agi unsaon pasulbad)*

2 Any conflict around fishery resources should be resolved amicably in the community by local leaders *(Bisag unsa nga away tungod sa kaisda-an dapat sulbahon sa kumonidad sa mga local nga lider)*

3 Any conflict around fishery resources should be brought to court and resolved according to provisions of the law *(Bisag unsa nga away dapat dad-on sa korte ug sulbahon pina-agi sa gisulti sa balaod)*

4 None of the above (ASK FOR ALTERNATIVE IDEAS) _____

3.04. Which of the following describe the current management of fishery resources in your community? *(Asa sa mga mosunod nagsulti kabahin sa pama-agi karon sa pagdumala sa kaisdaan sa inyong komunidad?)* (ALLOW ONLY ONE ANSWER)

1 There are no existing regulations enforced in the use of fishery resources *(Walay mga pamalaod nga gipatuman kabahin sa paggamit sa kaisdaan)*

2 The local government strongly enforces regulations in the use of fishery resources but without the participation of fishers *(Ang lokal nga gobyerno kusog kaayo nga nagpatuman sa pamalaod kabahin sa paggamit sa kaisadaan pero walay partisipasyon ang mga mananagat)*

3 The local government strongly enforces regulations in the use of fishery resources with the active participation of fishers *(Ang lokal nga gobyerno kusog kaayo nga nagpatuman sa pamalaod kabahin sa paggamit sa kaisadaan nga may aktibong partisipasyon ang mga mananagat)*

4 Only the fishers are strongly enforcing the regulations that protect fishery resources from abuse but without local government support *(Ang mga mananagat lamang ang makusganong nagpatuman sa mga pamalaod batok sa mga pag-abusong paggamit sa kaisdaan pero walay suporta gikan sa lokal nga gobyerno)*

5 None of the above (ASK FOR ALTERNATIVE IDEAS)_____

3.05. If there are conflicts resulting from the use of fishery resources, how are these resolved in your community? *(Kun ana-ay mga away nga ang hinungdan ang paggamit sa kaisdaan, giunsa man kini magresolba sa inyong komunidad?*

1 Nothing is being done to resolve the conflict and tension usually prevails among those involved *(Wala ray gibuhat ug nagpadayon ang away o di magsinabtanay)*

2 The aggrieved parties usually seek the intervention of local leaders to resolve the conflict *(Ang nag-away o wa magkasinabtanay nangita sa tabang sa mga lokal nga lider aron maresolba ang panabangi o away)*

3 The aggrieved parties usually go to court and file cases to resolve the conflicts *(Ang mga nagreklamo nipasaka og kaso sa korte)*

4 Others (SPECIFY) _____

3.06. Which of the following statement do you agree most about the responsibility for providing the needs of the family? *(Asa sa mga mosunod nga panultihon nga mouyon ka?)*

1 Providing the needs of the family is the sole responsibility of father/husband *(Ang mahatagan sa mga kinahanglanon ang pamilya responsibilidad ra sa amahan/bana)*

2 Providing the needs of the family is the sole responsibility of mother/wife. *(Ang mahatagan sa mga kinahnglanon ang pamilya responsibilidad ra sa inahan/asawa)*

3 Providing the needs of the family is the equal responsibility of the father/husband and mother/wife. *(Ang mahatagan sa mga kinahanglanon ang pamilya parehas nga responsibilidad sa amahan/bana ug inahan/asawa.*

3.07a. Please rate the degree of actual involvement of men and women you observed among the following group activities in your community. Rate 1 if you observed men are dominantly involved, 2 if women are dominantly involved or 3 if men and women are more or less equally involved. *(Palihug gradohi gikan ang pagkalambigit o pag-apil sa mga kalalakihan ug kababayenhan sa mga kalihukan sa inyong komunidad. Gradohi og 1 kun mga lalaki ang daghang nalambigit, 2 kun mga babaye ang daghang nalambigit o 3 kun parehas ang gidaghanon sa mga kalalakihan ug kababayenhan ang nalambigit).*

| | | | |
|---|---|---|---|
| a. Political meetings and activities *(Miting ug kalihukan pang politika)* | 1 | 2 | 3 |
| b. School meetings and activities *(Miting ug kalihukan sa eskuwelahan)* | 1 | 2 | 3 |
| c. Church meetings and activities *(Miting ug kalihukan sa simbahan)* | 1 | 2 | 3 |
| d. Cooperative work involving manual labor *(Dagyaw nga kinahanglan og pakusog o pisikal nga trabaho)* | 1 | 2 | 3 |
| e. Preparing food for group work *(Pag-andam sa pagkaon sa kalihukan sa grupo)* | 1 | 2 | 3 |
| f. Protecting and conserving the environment *(Pagproteksyon ug pagkonserbar sa kalikupan)* | 1 | 2 | 3 |

3.08. Which of the following statement do you agree most regarding livelihood diversity in the community? *(Asa sa mga mosunod nga panultihon nga mouyon ka kabahin sa mga klase sa panginabuhi-an?)*

1 People in the community had several and diverse sources of livelihood in the 1990s as compared in 2000 to the present *(Ang mga molupyo anaay daghan ug klase-klaseng mga panginabuhi-an niadtong 1990s kun ikumpara gikan sa 2000 hangtod karon)*

2 The number and kinds of livelihood of people in the community in 2000 up to the present are similar with the 1990s *(Parehas lamang ang kadaghanon ug klase sa mga panginabuhi-an sa mga molupyo niadtong 1990s ug 2000 hangtod karon)*

3 People in the community have limited number and kinds of livelihood in 2000 up to the present as compared in 2020s *(Ang mga molupyo anaay dyotay ug dili kaayo klase-klaseng mga panginabuhi-an niadtong 1990s kun ikumpara gikan sa 2000 hangtod karon)*

3.09. What rating can you give from 1 to 5 to the conditions of the different coastal ecosystem in your community during different years using the following scores: 1= 20% intact, 2= 40% intact, 3= 60% intact, 4= 80% intact, 5= 100% intact. *(Unsa ang grado gikan sa 1 hangtud 5 ang mahatag nimo sa kundisyon sa mga lainlaing ecosystems o rekursos sa kabaybayonan dinhi sa inyong lugar sa lainglaing mga katuigan gamit ang mga musunod nga grado: 1= 20% kumpleto, 2= 40% kumpleto, 3= 30% kumpleto, 4= 80% kumpleto, 5= 100% kumpleto.*

| Coastal Ecosystems | 1990s | | | | | 2000 up the present | | | | | 2020s | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. Mangroves *(bakhawan)* | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| b. Seagrass beds *(lusay)* | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| c. Coral reefs *(bahura)* | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| d. Estuaries *(bukana)* | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

3.10. Which of the following statements do you agree most regarding what you observed as to the allocation of benefits from fisheries in the community? *(Asa sa mga mosunod nga panultihon nga mouyon ka kabahin sa pagbahinay sa benepisyo gikan sa kaisdaan sa kumonidad?)*

1 Commercial fishers from outside the municipality are strongly restricted inside the municipal waters which are reserved for subsistence fishers *(Ang mga dagkong mananagat makusganong gikan sa laing lugar gidid-an sulod sa kadagatan sa lungsod nga para iya lamang sa mga gagmayng mananagat)*

2 Commercial fishers from within the municipality are allowed to fish in the municipal waters similar to local subsistence fishers *(Ang mga dagkong mananagat nga taga dinhi sa lungsod gitugutan nga managat sa sulod sa kadagatan sa lungsod parehas sa mga gagmayng mananagat)*

3 Commercial fishers and subsistence fishers of any origin are allowed in any municipal waters in the province *(Ang mga dagko ug gagmayng mga mananagat nga bisan taga-asa gitugutan nga mangisda sa bisag asang kadagatan sa mga lungsod sa probinsiya)*

4 None of the above (ASK FOR ALTERNATIVE IDEAS) _____

**4.00. SAFETY AT SEA**

4.01. What do you and the members of your household know in order to be safe at sea when fishing? *(Unsa ang nahibaw-an nimo ug sa mga sakop sa imong banay kun unsaon mahimong luwas o dili madisgrasya sa kadagatan?)* (ALLOW MULTIPLE RESPONSES)

1 Checking the condition of the fishing boat engine *(Pag-usisa sa kudisyon sa makina sa sakayang de motor)*

2 Bringing safety equipment every fishing trip (e.g. life jacket, life buoy) *(Pagdala og mga gamit para maluwas kada panagat)*

3 Bringing first aid kit every fishing trip *(Pagdala og mga pasiunang tambal kada panagat)*

4 Having radio or communication equipment in the fishing boat *(Pagbutang og mga kahimanan sa komunikasyon sa sakayan)*

5 Checking weather report every fishing trip *(Pag-usisa sa kundisyon sa panahon sa kada panagat)*

6 Learning the toxicity of marine species *(Pagkahibalo kun unsa ang mga makahilo nga mananap sa dagat)*

7 Others (SPECIFY) _____

4.02. How would you describe the number of sea accidents among fishers in your community during the past 12 months compared five years ago? *(Unsay imong ikasulti kabahin sa mga disgrasya sa kadagatan sa inyong kumunidad sa miaging 12 ka bulan kun ikumpara sa miaging 5 ka tauig?)*

1 Fewer number of sea accidents during the past 12 month compared five years ago *(Dyutay ra ang mga aksidente sa miaging 12 ka bulan kun ikumpara sa miaging 5 ka tuig)*

2 Same number of sea accidents during the past 12 months compared five years ago *(Parehas ra ang kadaghanon sa mga aksidente sa miaging 12 ka bulan kun ikumpara sa miaging 5 ka tuig)*

3 Greater number of sea accidents during the past 12 months compared five years ago *(Daghan ang mga aksidente sa miaging 12 ka bulan kun ikumpara sa miaging 5 ka tuig)*

4.03. Which of the disaster preparedness systems are currently disseminated and practiced in your community? *(Asa sa mga mosunod nga sistema sa pagpangandam para sa katalagman nga gipakaylap ug ginahimo sa inyong kumunidad?)* (ALLOW MULTIPLE RESPONSES)

1 Moving to elevated areas at times when typhoon occurs *(Paglalin sa taas nga lugar o dapit kun may bagyo)*

3 Storing enough foods to avoid going out from house during the typhoon *(Pagtigom og daghan nga pagkaon aron din a mogawas kun may bagyo)*

4 Anchoring house pillars to strong and big trees nearby to keep it in place during very high tide and strong winds *(Ihigot ang mga haligi sa balay sa dagkong kahoy para dili maanod kun taas ang tubig ug kusog ang hangin)*

5 Fixing the parts of the house that need repair before the storm comes to avoid accident *(Pag-ayo sa parte sa balay saw ala pa ang bagyo para makalikay sa disgrasya)*

6 Storing kerosene lamps, candles, flashlights, matches and other emergency source of lights *(Pagtigom og lampara, kandila, flashlights, posporo ug uban pa nga magamit para suga)*
7 Conducting community earthquake and fire drills *(Paghimo og pagbansaybansay para pangandam kun may linog ug sunog)*
8 Conducting regular community meeting pertaining to the disaster preparedness *(Paghimo og regular nga miting paghisgot kabahin sa mga pangandam batok sa mga katalagman)*
9 Organizing community search and rescue team involving volunteers *(Pagporma og mga boluntaryo para sa search and rescue team)*
10 Identifying evacuation centers to easily move affected people and households of disasters *(Pagtumbok sa mga evacuation centers aron dali madala ang mga tawo ug mga banay nga naapektohan sa katalagman)*
11 Others (SPECIFY) _____

4.04. If ever accidents will happen, how confident are you that (A) your household and (B) your community can avoid from accidents? *(Kun anaay aksidenteng mahitabo, unsa ang imong kasegurohan nga ang imong (A) banay ug (B) kumunidad mahalikay sa aksidented?)*

4.05. If ever accidents will happen, how confident are you that (A) your household and (B) your community can recover from accidents? *(Kun anaay aksidenteng mahitabo, unsa ang imong kasegurohan nga ang imong (A) banay ug (B) kumunidad mauli-an gikan sa aksidented?)* (ENCIRCLE ANSWERS IN COLUMN A AND B)

| 4.05A. Level of Confidence to Avoid from Accidents | A. Household | B. Community | 4.05B. Level of Confidence to Recover from Accidents | A. Household | B. Community |
|---|---|---|---|---|---|
| 1 Has up to 20% chances to avoid | 1 | 1 | 1 Has up to 20% chances to recover | 1 | 1 |
| 2 Has up to 40% chances to avoid | 2 | 2 | 2 Has up to 40% chances to recover | 2 | 2 |
| 3 Has up to 60% chances to avoid | 3 | 3 | 3 Has up to 60% chances to recover | 3 | 3 |
| 4 Has up to 80% chances to avoid | 4 | 4 | 4 Has up to 80% chances to recover | 4 | 4 |
| 5 Has up to 100% chances to avoid | 5 | 5 | 5 Has up to 100% chances to recover | 5 | 5 |

4.06. How would you describe the **number or amount** of fishery resources in your community during the past 12 months compared five years ago? *(Unsay imong ikasulti sa kadaghanon sa kaisdaan sa inyong kumunidad sa miaging 12 ka bulan kun ikumpara sa miaging 5 ka tuig?*
1 Fewer number or amount during the past 12 month compared five years ago *(Gamay ra ang gidaghanon sa miaging 12 ka bulan kun ikumparar sa miaging 5 ka tuig)*
2 Same number or amount during the past 12 months compared five years ago *(Parehas ra ang gidaghanon sa miaging 12 ka bulan ug sa miaging 5 ka tuig)*
3 Greater number or amount during the past 12 months compared five years ago *(Mas daghan sa miaging 12 ka bulan kun ikumparar sa miaging 5 ka tuig)*

4.07. (ENCIRCLE CODE OF FORMS OF PARTICIPATION AND ENTER THE RATING INTO THE APPROPRIATE COLUMN OF THE TABLE). A. What fishery activities that the women and children of your household are used or currently involved? *(Unsa ang mga buluhaton sa pagpanagat ug uban pa nga mahitungod sa isda nga nahalambigit ang mga babaye ug kabataan sa imong banay?)* Please rate the extent of time in the involvement of (B) women and (C) children in these activities from 1 to 5 using the following scores: *(Palihog gradohi ang kadakoon sa oras sa pagkahalambigit sa mga babaye ug kabataan):* 1= up to 20% of the time in doing this activity, 2= up to 40% of the time, 3= up to 60% of the time, 4= up to 80% of the time, 5= up to 100% of the time.

| A. Forms of Participation | B. Women | C. Children | A. Forms of Participation | B. Women | C. Children |
|---|---|---|---|---|---|
| 1 Actual catching of fish *(Panagat)* | | | 12 Buying fish to be sold *(Pagpalit og isda para baligya)* | | |
| 2 Unmeshing from the net *(Pagkuha gikan sa pukot)* | | | 13 Preparing food for the fishers *(Pagluto og pagkaon para sa mana-nagat)* | | |
| 3 Unhooking fish from the hook *(Pagkuha gikan sa taga)* | | | 14 Repairing the net *(Pag-ayo sa pukot)* | | |
| 4 Hauling fish from the boat to the coastline *(Paghakot sa isada)* | | | 15 Repairing the boat *(Pag-ayo sa sakayan)* | | |
| 5 Vending the fish *(Paglibod sa isda)* | | | 16 Hanging the net *(Pagsablay sa pukot)* | | |
| 6 Drying up the fish *(Pagbulad sa isda)* | | | 17 Placing the net on the boat *(Pagbutang sa pukot sa sakayan)* | | |
| 7 Salting the fish *(Paggamos sa isda)* | | | 18 Making arrangement with middle traders *(Pakigsabot sa kumprador)* | | |
| 8 Smoking the fish *(Paggama og smoked fish)* | | | 19 Preparing the containers for the catch *(Pag-andam sa sudlanan sa isda)* | | |
| 9 Weighing the fish *(Pagtimbang sa isda)* | | | 20 Borrowing money for capital in fishing *(Paghulam puhunan para sa panagat)* | | |
| 10 Making sardines *(Paggama og sardinas)* | | | 21 Others (SPECIFY) | | |
| 11 Counting the fish *(Pag-ihap sa isda)* | | | 22 | | |

4.07. A. What early warning devices and systems for disasters are available and functioning in your community? *(Unsa ang mga kagamitan nga makapahibalo sa uma-abot nga katalagman nga anaa sa inyong kumunidad?)* B. Please rate how effective they are to inform potential danger due to a disaster using the following score *(Palihug gradohi ang kaepektibo basi sa mga kaso nga ang maong mga galamiton nakapahibalo sa umalabot nga katalagman)*: 1= up to 20% of the cases there was incoming disasters, 2= up to 40% of the cases, 3= up to 60% of the cases, 4= up to 80% of the cases, 5= up to 100% of the cases. (ENCIRCLE CODE OF EARLY WARNING DEVICES AND SYSTEMS AND THE CORRESPONDING RATING IN THE APPROPRIATE COLUMN OF THE TABLE).

| 4.07A.Early Warning Devices and Systems | 4.07B. Rating of Status | | | | | 4.07A. Early Warning Devices and Systems | 4.07B. Rating of Status | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Siren | 1 | 2 | 3 | 4 | 5 | 6 Radio announcement | 1 | 2 | 3 | 4 | 5 |
| 2 Bell | 1 | 2 | 3 | 4 | 5 | 7 Television announcement | 1 | 2 | 3 | 4 | 5 |
| 3 Megaphone | 1 | 2 | 3 | 4 | 5 | 8 Village courier or runner | 1 | 2 | 3 | 4 | 5 |
| 4 Public audio system | 1 | 2 | 3 | 4 | 5 | 9 Others (SPECIFY) | 1 | 2 | 3 | 4 | 5 |
| 5 Cellphone | 1 | 2 | 3 | 4 | 5 | | 1 | 2 | 3 | 4 | 5 |

4.08. Which of the following statements do you agree most regarding climate change? *(Asa sa mga mosunod nga panultihon nga uyon ka kabahin sa climate change o pagkausab sa klima?)*

1 Climate change due to global warming is just a natural phenomenon and human activities do not contribute to it *(Natural lamang ang pagka-usob sa klima ug dili tungod sa mga ginahimo sa mga tawo)*

2 Climate change due to global warming is totally a result of destructive human activities on the environment *(Ang pagka-usob sa klima tungod sa pag-init sa kalibutan maoy resulta sa mga nahimong kadautan sa mga tawo sa palibot o kina-iyahan)*

3 Climate change is a natural process but destructive human activities had exacerbated global warming *(Natural ang pagka-usob sa klima pero ang mga nahimong kadautan sa mga tawo sa palibot nagpagrabe sa pag-init sa kalibutan)*

4.09. What can you suggest to improve safety and prevent disaster while at sea? *(Unsa ang imong ikasugyot aron makaseguro kita sa kaluwasan ug mapunggan ang mga katalagman samtang anaa sa dagat?*

_____

**5.00. POST-HARVESTING AND MARKETING**

5.01. A. Which of the following post-harvest practices or methods are done by your household with your fish catch? *(Unsa sa mga mosunod nga mga gawi o pama-agi sa pagproseso sa inyong kuha nga mga isda ang gibuhat sa imong banay?)* (ALLOW MULTIPLE RESPONSES). 5.02-B—5.03-C. Please rate the levels of knowledge and skills your household has about these post-harvest practices using the following score *(Palihug gradohi ang inyong kahibalo ug kahanas sa maong mga pama-agi sa pagproseso sa isda)*: 1= has 20% of the needed knowledge and skills *(may 20% sa gikinahanglang kahibalo ug kahanas)*, 2= has 40% of the needed knowledge and skills, 3= has 60% of the needed knowledge and skills, 4= has 80% of the needed knowledge and skills, 5= has 100% of the needed knowledge and skills in performing the tasks.

| 5.01-A. Post-harvest Practices or Methods | | 5.01-B. Level of Knowledge | | | | | 5.01-C. Level of Skills | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Chilling | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 2 | Freezing | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 3 | Brining | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 4 | Canning | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 5 | Fermenting | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 6 | Packaging | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 7 | Sun drying | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 8 | Smoking | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 9 | Salting | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 10 | Sauce making | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 11 | Others (SPECIFY) | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

5.02. Are there instances that you discarded some of the fishes caught and not sold to the market during the past 12 months? *(Ana-a bay mga panahon nga wala ninyo gibaligya sa merkado o kumprador ang inyong kuhang isda sa miaging 12 ka bulan?)*

1 Yes 2 No (SKIP TO Q 5.05)

5.03. (IF YES) Why did you discard some of these fishes? *(Nganong wala ninyo nabaligya?)*

1 Small sizes and are not marketable *(Gagmay ug dili mahalin)*
2 Not the preferred fish species to buy *(Dili mao ang ginapalit nga isda)*
3 Rotten because too many already and cannot be preserved *(Nadaut o nabal-og kay daghan kaayo ug dili na mapreserbar)*
4 No more buyers *(Wala nay mopalit)*
5 Others (SPECIFY) _____

5.04. What did you do with the discarded fishes? *(Unsa ang inyong gihimo sa wala mabaligya nga mga isda?)*

1 Given to neighbors and friends *(Gipanghatag sa mga silingan ug kaila)*
2 Feed to pigs *(Gipakaon sa mga baboy)*
3 Just thrown away *(Gipanglabay ra)*
4 Made into sauce *(Gigama og una)*
5 Turned into dried or salted fish *(Gihimong bulad o ginamos)*
6 Others (SPECIFY) _____

5.05. Please give three major problems you have in ensuring the quality of your fishery products *(Palihug paghatag og tulo ka problema kun unsaon pagseguro sa kalidad sa mga produktong isda).*

1. _____ 2. _____ 3. _____

5.06. Do you agree that the fishers in the community have exerted some influence on the market? *(Mouyon ka ba nga ang mga mananagat sa kumunidad anaay impluwensya sa merkado sa isda?)*

1 Yes 2 No (SKIP TO Q 5.08)

5.07. (IF YES) What do you observe are the ways by which fishers have influenced the market? *(Unsa ang imong nakita nga mga sitwasyon o pa-agi nga ang mga mananagat nakimpluwensya sa merkado sa isda)* (ALLOW MULTIPLE RESPONSES)

1 Supply of fish sold in the market *(Ang suplay o gidaghanon sa isda sa merkado)*
2 Quality of fish sold in the market *(Ang kalidad sa isda nga gibaligya sa merkado)*
3 Price of fish sold in the market *(Ang presyo sa isda sa merkado)*
4 Others (SPECIFY) _____

5.08. (READ EACH ITEM TO THE RESPONDENT AND REFER ALSO TO THE ANSWERS IN 6.01) Who and how many among the members of your households are involved in this particular fish product processing and marketing? *(Kinsa ug pila sa mga miyembro sa inyong banay ang apil sa pagproseso ug pagbaligya sa mga isda?)* (ENCIRCLE THE CODE CORRESPONDING TO THE ANSWERS OF THE RESPONDENT. EXCEPT FOR FATHER AND MOTHER, INDICATE THE NUMBER WHO ARE INVOLVED INSIDE THE PARENTHESES)

| Fish Product Processing and Marketing Activities | Household Members Involved | | | | | |
|---|---|---|---|---|---|---|
| | Father | Mother | Sons | Daughters | Others-Male | Others-Female |
| 1 Chilling | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 2 Freezing | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 3 Brining | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 4 Canning | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 5 Fermenting | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 6 Packaging | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 7 Sun drying *(Pagbulad)* | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 8 Smoking | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 9 Salting *(Paggamos)* | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 10 Sauce making | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 11 Peddling *(Paglibod)* | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 12 Delivering to buyers *(Pagdeliber)* | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 13 Vending in the market *(Pagtinda)* | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |
| 14 Others (SPECIFY) | 1 | 2 | 3 ( ) | 4 ( ) | 5 ( ) | 6 ( ) |

5.09. (ASK FOR EACH OF THE ITEM AND ENCIRCLE THE CORRESPONDING ANSWER OF THE RESPONDENT INSIDE THE TABLE) Are you aware of the following measures to ensure safe, sanitary and healthy ways of food processing and preservation? *(Suheto o kahibalo ka ba sa mga mosunod nga pama-agi aron maseguro ang luwas, limpiyo ug himsog nga pama-agi sa pagproseso ug pagpreserbar sa pagkaon?)*

1 Yes 2 No

| Safe, Sanitary and Healthy Measures | Response | |
|---|---|---|
| a. Landed fish should not be exposed to the sun and should be iced *(Dili painitan ug dapat butangan og ice ang isdang niabot sa pier)* | 1 | 2 |
| b. Fish should be inspected for appearance and odor and fish of unacceptable quality should be rejected *(Usisaon ang isda kun dili baho ug maayo ang itsura og kun dili kinahanglan dili dawaton)* | 1 | 2 |
| c. Bacteriological tests on representative samples of processed fish should be conducted *(Mobuhat og laboratory test sa mga sample sa isda)* | 1 | 2 |
| d. A cleaning schedule should be followed for all work areas and surfaces using water containing 5 to 10 ppm of free chlorine *(Regular nga limpiyohan ang lugar nga gitrabahoan ug banlasan og tubig nga may chlorine (5 to 10 ppm).* | 1 | 2 |
| e. All fish slime and blood should be removed by hosing down with chlorinated water and at the end of the day and all surfaces should be rinsed with clean water having 5 ppm of chlorine *(Kuhaon ang lansa ug dugo sa isda pina-agi sa paghose (pagbanlas) niini og tubig kada adlaw ug banlawan og tubig nga may clhlorine (5 to 10 ppm)* | 1 | 2 |
| f. Smoking and spitting in work areas should not be permitted and hands must be washed with bactericidal soap prior to handling fish and after a visit to the toilet *(Idili ang pagpanigarilyo ug pangluwa sa lugar nga gitrabahoan ug kinahanglan ang paghugas sa kamot kada hikap sa isda o kun gikan sa kasilyas)* | 1 | 2 |
| g. Water and ice samples should be analyzed as per testing schedule by ISO certified laboratories for levels of chemical and bacteriological contamination and potability *(Ang tubig ug ice nga ginagamit kinahanglan lestingan sa ISO certified nga laboratoryo para mahibaw-an kun kontaminado o dili sa bacteria)* | 1 | 2 |
| h. All drainage systems should be ensured to be in good working order *(Ang tanang kanal kinahanglan maayo ang kundisyon)* | 1 | 2 |
| i. The harbor should be free of animals, rodents and pests *(Ang pantalan kinahanglan nga walay mga mananap, ilaga ug peste).* | 1 | 2 |
| j. There should be no bird nests in the fish handling area *(Kinahanglan nga walay salag sa langgam diha sa lugar nga trabahoanan)* | 1 | 2 |
| k. Wastes should be disposed of sanitarily *(Kinahanglan nga ang mga basura nalabay sa hustong lugar)* | 1 | 2 |

| | | |
|---|---|---|
| l. Cold storage equipment should be checked to ensure that the right temperature is being maintained (*Kinahanglan nga namintenar ang hustong temperature sa bugnaw nga pondohanan)* | 1 | 2 |
| m. All precaution and warning signs should be readable (e.g., NO SMOKING, NO SPITTING, NO EATING) (*Kinahanglan nga ang tanang precaution ug warning signs maklaro ug mabasa)* | 1 | 2 |
| n. Toilet should be present in processing centers with adequate water supply *(Kinahanglan anaay kasilyas ug abunda sa tubig sa magamit)* | 1 | 2 |
| o. Toilet and shower facilities should be kept clean and in perfect working order *(Kinahanglan nga ang kasilyas ug kaligoanan limpyo ug dili guba)* | 1 | 2 |

**6.00. LIVELIHOOD ENHANCEMENT AND DIVERSIFICATION**

6.01. How do you describe the economic condition of your household during different periods? *(Unsa ang imong ikasulti sa ekonomikanhong kundisyon sa imong banay sa lainlaing mga katuigan?)*

1 Present is poorer compared five years ago *(Mas pobre karon kumpara sa miaging 5 ka tuig)*
2 Present is similar to five years ago *(Ang karon parehas lamang sa miaging 5 ka tuig)*
3 Present is better or improved compared five years ago *(Mas niayo o niumento karon kumpara sa miaging 5 ka tuig)*

6.02. Do you favor changing your household's livelihood to something else? *(Mouyon ka ba nga ilisan og laing panginabuhian ang imong banay?)*

1 Yes 2 No

6.03. A. What some institutions and organizations do you know that provide supportive services for livelihood enhancement and diversification that are available in your community? *(Unsa ang imong nahibaw-ang mga institusyon ug kapunungan nga gahatag tabang o suporta para mapauswag ug mapadaghan ang panginabuhian sa inyong kumunidad?)* (ALLOW MULTIPLE RESPONSES) B. (ASK FOR THOSE MENTIONED INSTITUTIONS) What supportive services did you receive from the said institutions and organizations? **e.g. skills training, product packaging training, subsidy** *(Unsa man ang mga tabang o suporta ang inyong nadawat gikan nila?)* C. Please rate your level of satisfaction with the support they provided to your household using the following scores *(Palihug gradohi ang inyong kahimuot sa suporta nga ilang nahatag sa imong banay)*: 0= did not receive any services, 1= Not satisfied, 2= Barely satisfied, 3= Somewhat satisfied, 4= Very satisfied, 5= Very much satisfied.

| A. Institutions and Organizations | B. Supportive Services Provided | C. Satisfaction Rating | | | | | |
|---|---|---|---|---|---|---|---|
| 1 Technical Education and Skills Development Authority | | 0 | 1 | 2 | 3 | 4 | 5 |
| 2 Department of Trade and Industry | | 0 | 1 | 2 | 3 | 4 | 5 |
| 3 Non-government organizations (SPECIFY NAME) | | 0 | 1 | 2 | 3 | 4 | 5 |
| 4 Cooperatives (SPECIFY NAME) | | 0 | 1 | 2 | 3 | 4 | 5 |
| 5 Academic institutions (SPECIFY NAME) | | 0 | 1 | 2 | 3 | 4 | 5 |
| 6 Government banks (SPECIFY NAME) | | 0 | 1 | 2 | 3 | 4 | 5 |
| 7 Commercial banks (SPECIFY NAME) | | 0 | 1 | 2 | 3 | 4 | 5 |
| 8 Rural banks (SPECIFY NAME) | | 0 | 1 | 2 | 3 | 4 | 5 |
| 9 Others (SPECIFY NAME) | | 0 | 1 | 2 | 3 | 4 | 5 |

**7.00. MICRO-FINANCE INSTITUTIONS**

7.01. Had your household accessed financial services from formal financial institutions? *(Nakadawat ba ang imong banay og serbisyong pinansiyal gikan sa mga pormal nga institusyong pinansiyal?)*

1 Yes 2 No

7.02. (IF YES) A. From which of the different formal financial institutions you had availed of financial services? (ALLOW MULTIPLE RESPONSES) *(Gikan sa unsang institusyon kini?)* B. What are the names of these financial institutions? *(Unsa ang iyang ngalan?)* (SPECIFY NAMES) C. What services did you avail? *(Unsa ang serbisyong inyong nadawat?)* (ENCIRCLE)

| A. Financial Institutions | B. Names | C. Services Availed |
|---|---|---|
| 1 Commercial banks | | 1 Borrowing money 2 Saving deposits |
| 2 Government banks | | 1 Borrowing money 2 Saving deposits |
| 3 Rural banks | | 1 Borrowing money 2 Saving deposits |
| 4 Cooperatives | | 1 Borrowing money 2 Saving deposits |
| 5 Lending agencies | | 1 Borrowing money 2 Saving deposits |
| 6 Others (SPECIFY) | | 1 Borrowing money 2 Saving deposits |

7.03. (ENCIRCLE FIRST THOSE CITED IN Q7.02) Please rate from 1 to 5 your satisfaction of the formal financial institutions you had availed of services in terms of loan requirements, repayment procedures, proximity, interest rates, and dealing with clients using the following scores *(Palihug gradohi gikan sa 1 hangtod sa 5 ang imong kahimuot sa serbisyong pinansiyal nga nadawat ninyo gikan sa nahisgutang pormal nga institusyong pinasiyal sumala sa gikinahanglan sa paghulam, paagi sa pagbayad, kaduol sa lokasyon, ang porseyento sa umento ug pagtimbaya sa mga kliyente)*: 1= Not satisfied, 2= Barely satisfied, 3= Somewhat satisfied, 4= Very satisfied, 5= Very much satisfied.

| Financial Institutions | a. Loan Requirements | b. Repayment Procedure | c. Proximity | d. Interest Rates | e. Dealing with Clients |
|---|---|---|---|---|---|
| 1 Commercial banks | | | | | |
| 2 Government banks | | | | | |
| 3 Rural banks | | | | | |
| 4 Cooperatives | | | | | |
| 5 Lending agencies | | | | | |
| 6 Others (SPECIFY) | | | | | |

7.04. A. What are the informal mechanisms of accessing credit which your household had experienced? *(Unsa ang mga inpormal nga mekanismo o pama-agi sa pagpangutang nga nasulayan sa imong banay?)* B. Please rate your satisfaction of these informal mechanisms to access credit in terms of loan requirements, repayment procedures, proximity, interest rates, dealing with clients using the following scores *(Palihug gradohi gikan sa 1 hangtod sa 5 ang imong kahimuot sa serbisyong pinansiyal nga nadawat ninyo gikan sa nahisgutang inpormal nga institusyong pinansiyal sumala sa gikinahanglan sa paghulam, paagi sa pagbayad, kaduol sa lokasyon, ang porseyento sa umento ug pagtimbaya sa mga kliyente)*: 1= Not satisfied, 2= Barely satisfied, 3= Somewhat satisfied, 4= Very satisfied, 5= Very much satisfied.

| Informal Financial Mechanisms | a. Loan Requirements | b. Repayment Procedure | c. Proximity | d. Interest Rates | e. Dealing with Clients |
|---|---|---|---|---|---|
| 1 Moneylenders *(tigpatanto)* | | | | | |
| 2 Middle buyers *(kumprador)* | | | | | |
| 3 Relatives *(paryente)* | | | | | |
| 4 Friends *(higala)* | | | | | |

7.05. What ways can you suggest where the community can save and benefit together? *(Unsa ang imong ikasugyot aron ang inyong kumunidad magkahiusang makatigom og kwarta ug makabenepisyo usab gikan niini?)*

1 Forming a cooperative *(pagporma og usa ka kooperatiba)*
2 Practicing rotating savings *(maghulugay og kwarta kada bulan ug ilibot kinsa ang makakuha sa natigom nga kwarta)*
3 Others (SPECIFY)_____

7.06. In your household, who represent or take charge in accessing financial services from the following financial institutions and mechanisms? *(Sa in inyong banay, kinsa ang kalagmitan ang responsible sa pagkuha og serbisyong pinansiyal sa mga mosunod nga institusyong pinansiyal ug mekanismo o pama-agi?)* (ENCIRCLE FIRST THE FINANCIAL INSTITUTIONS AND MECHANISMS AS CITED THEN ASK IF HUSBAND, WIFE OR BOTH HAVE ACCESSED)

| Formal and Informal Financial Institutions and Mechanisms | | Husband | Wife | Both Husband and Wife |
|---|---|---|---|---|
| 1 | Commercial banks | 1 | 2 | 3 |
| 2 | Government banks (Land Bank) | 1 | 2 | 3 |
| 3 | Rural banks | 1 | 2 | 3 |
| 4 | Cooperatives | 1 | 2 | 3 |
| 5 | Lending agencies | 1 | 2 | 3 |
| 6 | Moneylenders *(tigpatanto)* | 1 | 2 | 3 |
| 7 | Middle buyers *(kumprador)* | 1 | 2 | 3 |
| 8 | Relatives *(paryente)* | 1 | 2 | 3 |
| 9 | Friends *(higala)* | 1 | 2 | 3 |
| 10 | Others (SPECIFY) | 1 | 2 | 3 |

7.07. Does your household avail of government subsidized credit lines during the past 12 months? *(Nakadawat ba ang imong banay og pa-utang gikan sa gobyerno nga may subsidiya o tinabangan ang pagbayad sa miaging 12 ka bulan?)*

1 Yes 2 No

7.08. Had you or any member of your household members attended a seminar or training about lending that was conducted in your community? *(Nakatambong ka ba o bisan kinsa sa imong banay og usa ka seminar o pagbansaybansay kabahin sa pa-utang nga gihimo sa inyong kumunidad?)*

1 Yes 2 No

7.09. What can you suggest to improve the lending relationships between fishers and micro finance institutions? *(Unsa ang imong ikasugyot aron mag-maayo ang relasyon o transaksyon sa pagpahulam og kwarta sa mga mananagat ug gagmayng pinansiyal nga institusyong?*_____

NOTE: REASSURE YOUR RESPONDENT THAT HIS/HER IDENTITY WILL NOT BE KNOWN TO OTHERS AND HIS/HER ANSWERS WILL BE USED PRIMARILY FOR THIS STUDY. CHECK AGAIN THE FORM FOR ANY GAPS AND THANK SINCERELY YOUR RESPONDENT BEFORE LEAVING. INFORM HIM/HER THAT YOU WILL BE VISITING HIM/HER AGAIN IF THERE ARE OTHER SETS OF INFORMATION NEEDED.