

# **Community-based Coastal Resource Management and Co-Management: Approaches to Increase Fish Productivity in Villa, Iloilo City, Philippines (Year 1)**

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## **ABSTRACT**

This preliminary study delved to increase fish productivity in Villa Beach, Iloilo City by utilizing two approaches: the community-based coastal resource management (CBCRM) and co-management (CoM) approach. Specifically, this study aimed to determine the fishing effort and fish catch per unit effort (CPUE); identify the causes for low fish catch; and elicit suggestions from the fisherfolks and the local government units (LGU's) of the plans of action and actions taken on the causes of low fish catch and to increase fish productivity. Twenty-seven fisherfolks were interviewed and representatives of the Office of the Village Chairman in Villa, Iloilo City and Office of the Mayor in Iloilo City, Philippines. This study revealed that fishing effort was equivalent to 63 fishermen per day in Villa, Iloilo City. Most of the time, two fisherfolks went to shore to

fish. The mean CPUE is 10.03 kg/boat/day. Causes of low fish catch were varied. The suggestions raised by the fisherfolks on the causes of low fish catch and to increase fish productivity were answered by the LGU's regarding of their plans of action and actions taken. However, a follow-up study should be conducted to assure that these plans of action will be realized for the benefit of the fisherfolks.

## **KEYWORDS**

Coastal Resource Management, fish productivity, descriptive design, Iloilo City, Philippines

## **INTRODUCTION**

The village is the most important niche in society because of its vital function to support rural development due to the participation of locals about community project identification and implementation (Salvador, 2004). Pomeroy and Carlos (1996) observed that the problems in the coastal communities include low fish productivity, poverty, resource depletion, and environmental degradation; while La Viña (2002) also added the uncontrolled tourism, shoreline development, mining, waste pollution generated by industrial and domestic, and upland deforestation.

The depletion of coastal resources such as mangroves, destruction of coral reefs, and decrease in fish yields are attributed to high population density where locals overfish and engage in illegal fishing practices such as muro-ami and cyanide fishing (Parras, 2001; Nong, 2000; Samarakon, Nightingale, Hermes, Joseph, & Salagrama, 2011).

In Indonesia, locals established the community-based coral reefs and created measures on coastal management (Crawford, Dutton, Rotinsulu, & Hale, 1998). It is quite interesting to know that local communities could become coastal resource managers if they are trained and empowered (Tulungen, Kusoy, & Crawford, 1998).

Alcala (1998) mentioned that the approach known as coastal resource management was applied in the mid-1970s more specifically the community-based coastal resource management (CBCRM). This approach provides the residents in the community the opportunity and responsibility to govern their own resources by defining their needs, goals, aspirations, and decisions affecting their well-being (Pomeroy & Carlos, 1996). CBCRM is a common and major

approach to conservation and management of fisheries in the tropical region (Maliao, Pomeroy, & Turingan, 2009) and its core concept is the participation of the people in the community (Ferrer & Nozawa, 1997) because resources will be protected if there is involvement of the residents or locals in the community (Nong, 2000).

Meanwhile, co-management is defined as the sharing of responsibilities between the government and stakeholders in the management of coastal resources. These stakeholders include the fishermen, non-governmental organizations (NGOs), local community, and other stakeholders who have direct and indirect participation in the management of fishery (Pomeroy, 1995; Pomeroy, 1998; Pomeroy & Williams, 1994). It is believed that partnership between the government and local resource users could strengthen the sustainability of a program or project on CBCRM (Pomeroy, 1995; Crawford, Siahainenia, Rotinsulu, & Sukmara, 2004; Salvador, 2004). Pomeroy (1995) suggested that fisherfolks should cooperate to create laws and regulations which will counteract any fishery or coastal resource problems. If coastal resource management is achieved, the fish catch will increase and allow the recovery of environment and fishery resources (CRMP, 2004; Alcalá, 1998; Raymundo, 2002).

## **OBJECTIVES OF THE STUDY**

This preliminary study delved to increase fish productivity in Villa Beach, Iloilo City by utilizing two approaches: the community-based coastal resource management (CBCRM) and co-management (CoM) approach. Specifically, this study aimed to: 1. determine the fishing effort and fish catch per unit effort (CPUE); 2. identify the causes for low fish catch; and 3. elicit suggestions from the fisherfolks and from the local government units (LGU's) of the plans of action and actions taken on the causes of low fish catch and to increase fish productivity.

## **METHODOLOGY**

### **Research Design**

This study utilized the descriptive survey as a research design. A descriptive survey uses the same set of questions for a large number of individuals (Fraenkel & Wallen, 2010). This descriptive survey looks into fish catch, causes of low fish catch, and its corresponding suggestions from the fisherfolks and plan of action and actions taken from the local government units (LGU's) on causes of low fish catch and to increase fish productivity.

## **Respondents**

Twenty-seven (27) fisherfolks located at Villa, Iloilo City, were selected through convenience sampling. They were gathered at John B. Lacson Foundation Maritime University-Arevalo, JBL Hall last December 2, 2015. Meanwhile, the local government units (LGU's) in this study refer to the Office of the Village Chairman in Villa, Iloilo City and the Office of the Mayor in Iloilo City.

## **Instrument**

The interview schedule is divided into two parts. The first part determines the fishing effort which is measured by the number of fisherfolks per day and fish catch per unit effort (CPUE) which is measured by kilogram of fish per boat per day (Abobi, Ekau, Wolff, Blay, & Campion, 2013) and the causes for low fish catch. The second part delved into corresponding suggestions by the fisherfolks and plan of action and actions taken by local government units (LGU's) on the causes of low fish catch and to increase fish productivity.

## **Data Collection**

Fisherfolks were asked about the fishing effort, CPUE, and causes for low fish catch. Likewise, these fisherfolks and the local government units were interviewed about the possible suggestions and plan of action and actions taken on the causes of low fish catch and to increase fish yields.

## **Data Analysis**

Frequencies, percentage, and rank were used to determine the individual components of fishing effort, CPUE and the causes for low fish catch. The formula for CPUE following Abobi et al. (2013) is kilogram of fish/boat/day. Problems and issues arising from low fish catch and corresponding suggestions or solutions were analyzed by using themes.

# **RESULTS AND DISCUSSION**

## **Fishing effort and catch per unit effort (CPUE)**

The fishing effort is equivalent to 63 fishermen per day in Villa, Iloilo City. Most of the time, two fisherfolks went to shore to fish. The mean CPUE is 10.03 kg/boat/day which is closer to the work of Abobi et al., (2013).

### Causes for low fish catch

Grande, Sigue, Alova, Formentera, and Mandario (2015) revealed that fishermen have insufficient fish productivity or fish catch. The top five causes of low fish catch are the following: garbage (usually plastic), illegal trawling, more fisherfolks are fishing, use of “tangab,” lack of fishing equipment, and destruction of “panggal” and fishing nets by their fellow fisherfolks. This data agrees with the result of Nong (2000) and Parras (2001).

### Suggestions of fisherfolks on the causes of low fish catch

The causes discussed above were given solutions as suggested by the fisherfolks. This is where community-based coastal resource management (CBCRM) comes in. The suggestions of the fisherfolks were given attention or brought to the attention of LGU’s for proper actions. Tables 1 and 2 show the results.

Tables 3 and 4 show the suggestions of fisherfolks and the actions taken from the local government units (LGU’s) on how to increase fish yields.

Table 1. Top causes of low fish catch, suggestions of fisherfolks in Villa, Iloilo City, Philippines, plan of actions, and actions Taken from the LGU (Village)

Causes of Low Fish Catch	Suggestions of Fisherfolks	Plan of Actions	Actions Taken
1. Garbage (usually plastic)	<ol style="list-style-type: none"> <li>1. Give sanctions or penalty for those who will get caught.</li> <li>2. Conduct coastal clean-up regularly.</li> <li>3. Post warning signs not to dump garbage in any part of the shore.</li> <li>4. Inform or remind the public every village meetings.</li> <li>5. Give reward for cleanest shore among three zones</li> </ol>	<ol style="list-style-type: none"> <li>1. Educate the people</li> <li>2. Give corresponding fine in pesos</li> <li>3. Assign personnel for cleaning up</li> <li>4. Conduct clean-up twice a month</li> <li>5. Disseminate information through village personnel assigned in every zone</li> <li>6. Look for funds/budget</li> </ol>	<ol style="list-style-type: none"> <li>1. Already implemented by the Village</li> <li>2. Already implemented by the Village</li> <li>3. Already implemented by the Village</li> </ol>
2. Illegal trawling	<ol style="list-style-type: none"> <li>1. Stop this type of fishing activity.</li> <li>2. The Village should assign “Bantay Dagat” or Coast Guard.</li> </ol>	<ol style="list-style-type: none"> <li>1. Endorse resolution to City Mayor for the elimination of illegal fishing especially trawling</li> <li>2. Implement penalty of imprisonment</li> </ol>	

<b>Causes of Low Fish Catch</b>	<b>Suggestions of Fisherfolks</b>	<b>Plan of Actions</b>	<b>Actions Taken</b>
3. More fisherfolks are fishing	<ol style="list-style-type: none"> <li>1. There should have a boundary so that non-Villa fisherfolks could not fish at the shores of Villa, Iloilo City.</li> <li>2. Fisherfolks should help each other and not be jealous.</li> <li>3. LGU's should give us alternative jobs.</li> </ol>	<ol style="list-style-type: none"> <li>1. Will implement this suggestion if there is a City Ordinance</li> <li>2. Will find a way for alternative livelihood</li> </ol>	
4. Use of "tangab"	<ol style="list-style-type: none"> <li>1. Stop this type of fishing activity.</li> <li>2. The Village should assign "Bantay Dagat" or Coast Guard</li> </ol>	<ol style="list-style-type: none"> <li>1. The Village will support</li> <li>2. A corresponding size of net should be strictly implemented</li> <li>3. Support this suggestion</li> </ol>	
5. Lack of fishing equipment	Solicit from other institutions, individual or LGU's to procure other fishing equipment.	<ol style="list-style-type: none"> <li>1. To find a way to buy fishing gear</li> <li>2. Promote alternative fishing like fishing hook, fish net with the corresponding size.</li> </ol>	
6. Destruction of "panggal" and fishing nets by fellow fisherfolks	<ol style="list-style-type: none"> <li>1. Other fisherfolks should be considerate to their fellow fisherfolks.</li> <li>2. The Village should assign "Bantay Dagat" or Coast Guard to watch those who destroy the "panggal" and give sanctions.</li> </ol>	<ol style="list-style-type: none"> <li>1. Give penalty for fishermen using illegal nets</li> <li>2. Encourage fishermen not to be jealous instead help each other for this is their sole source of income.</li> <li>3. The Village will support this suggestion if the city government has an ordinance or resolution passed.</li> </ol>	

Table 2. Top causes of low fish catch, suggestions of fisherfolks in Villa, Iloilo City, Philippines, plan of actions, and actions taken from the LGU (City Government)

<b>Causes of Low Fish Catch</b>	<b>Suggestions of Fisherfolks</b>	<b>Plan of Actions</b>	<b>Actions Taken</b>
1. Garbage (usually plastic)	<ol style="list-style-type: none"> <li>1. Give sanctions or penalty for those who will get caught.</li> <li>2. Conduct coastal clean-up regularly.</li> <li>3. Post warning signs not to dump garbage in any parts of the shore.</li> <li>4. Inform or remind the public every village meetings.</li> <li>5. Give reward for cleanest shore among three zones.</li> </ol>	<ol style="list-style-type: none"> <li>1. Proper implementation of Anti-littering Ordinance</li> <li>2. Initiate clean-up drive by village officials with the cooperation of the residents.</li> <li>3. The activity should be village-based.</li> <li>4. Put up signage along the coastal areas as part of their business social responsibility.</li> <li>5. Sustain activity incorporating to regular village programs.</li> <li>6. Include environmental conservation, preservations and protection in Village assembly meeting.</li> <li>7. Institutionalize a regular yearly program having incentive system for Village with the cleanest area.</li> </ol>	<ol style="list-style-type: none"> <li>1. Passage of Anti-littering Ordinance</li> <li>2. Coordination with NGO, Civic org., and some private individuals in coastal cleaning activities.</li> <li>3. Implemented long before but proved ineffective because even the signage was destroyed or lost.</li> <li>4. Occasional activity involving IBC has been a common tool.</li> <li>5. Some villages include this concern in their agenda.</li> <li>6. Conceived but implemented with “ningas cogon” attitude</li> </ol>
2. Illegal trawling	<ol style="list-style-type: none"> <li>1. Stop this type of fishing activity.</li> <li>2. The Village should assign “Bantay Dagat” or Coast Guard.</li> </ol>	<ol style="list-style-type: none"> <li>1. Functionality of CFARMC and BFARMC’s</li> <li>2. Conduct regular IEC</li> <li>3. Sustain advanced C/ BFARMCs to implement the program.</li> <li>4. Reactivate village “bantay dagat” and deputize fish warden.</li> </ol>	<ol style="list-style-type: none"> <li>1. Already contained in R.A. 8550 as amended by R.A. 10654</li> <li>2. Info-education campaign</li> <li>3. “Bantay Dagat” program is a regular mandate with active participation of BFARMC’s</li> <li>4. The City Agri has “Bantay Dagat” program but its activities are undertaken monthly in “Iloilo River”.</li> </ol>

Causes of Low Fish Catch	Suggestions of Fisherfolks	Plan of Actions	Actions Taken
3. More fisherfolks are fishing	<p>1. There should have a boundary so that non-Villa fisherfolks could not fish at the shores of Villa, Iloilo City.</p> <p>2. Fisherfolks should help each other and not to be jealous.</p> <p>3. LGU's should give us alternative jobs.</p>	<p>1. Re-establishment of city water boundaries to clearly define its fluvial jurisdiction.</p> <p>2. Identification of sector members concerning fish records and unify fishing activities.</p> <p>3. Conduct seminar on values formation.</p> <p>4. Initiate a fisheries product processing center for the utilization of fisherfolk sectors for their alternative livelihood activities</p> <p>5. Continue to avail livelihood projects for fisherfolks from national agencies and private sector.</p>	<p>1. Municipal waters have been delineated as contained in RO 2003-233 but there is no such thing as village waters.</p> <p>2. The city has a fishing regulation ordinance that delineates boundaries of city and municipalities adjacent to each other.</p> <p>3. Initiatives to organize the sector have been initiated with reluctant response</p> <p>4. Already initiated but requires complementary activities to equip the recipient with knowledge on the alternative activities</p>
4. Use of "tangab"	<p>1. Stop this type of fishing activity.</p> <p>2. The Village should assign "Bantay Dagat" or Coast Guard.</p>	<p>1. Complement regulation with gear design modification to eliminate destructive effect.</p> <p>2. Monitor this fishing activity regularly and apprehend the violators.</p> <p>3. Reactivate and organize village "Bantay Dagat" teams</p>	<p>1. Regulation of its operation according to season</p> <p>2. Have deputized several fisherfolks as fish orders</p> <p>3. The city Agi Office has a "Bantay Dagat"</p>



Causes of Low Fish Catch	Suggestions of Fisherfolks	Plan of Actions	Actions Taken
5. Lack of fishing equipment	1. Solicit from other institutions, individual or LGU's to procure other fishing equipment.	1. Complementation of national government programs by the LGU 2. Facilitate the distribution of the fishing gear to the city fisherfolks. 3. Top the resources of BFAR	1. Designed a BUB-Program to identify sectoral needs requiring funding support/BFAR-AHON Program 2. BFAR 6 provided gill net and other gear including engines to fisherfolks of Iloilo City for the year 2016.
6. Destruction of "panggal" and fishing nets by fellow fisherfolks	1. Other fisherfolks should be considerate to their fellow fisherfolks. 2. The Village should assign "Bantay Dagat" or Coast Guard to watch those who destroy the "panggal" and give sanctions.	1. Delineation of fishing grounds according to gears used. 2. Coordinate with proper authorities like PNP and Village. Officials to stop these unwanted and criminal activities. 3. Update registry of fisherfolks and conduct regular meetings w/ BFARMC. 4. Enforce the Iloilo River Development Program in banning the illegal structures such as Fish Corals in Iloilo River and Batiano River. 5. A unify "Bantay Dagat" team with Coastal village participation. 6. BFARMC should deputize Village Fish Warden.	1. Zonifications and fishing grounds in Municipal Waters 2. Validating these allegations and encouraging complaints 3. The office has implemented the eradication of fish corals along Iloilo River and Batiano River and was given Financial aid to support their alternative livelihood. 4. There was an existing "Bantay Dagat" Program but lacked coordination with village level.

Table 3. Suggestions of fisherfolks in Villa, Iloilo City, Philippines to increase fish yields, plan of actions, and actions taken of LGU (Village)

Suggestions of Fisherfolks	Plans of Action	Actions Taken
1. Put up artificial reefs but not open for fishing.	1. The Village will support for the benefit of all 2. Create a Waste Management Program	
2. Create a Municipal Ordinance to stop the use of trawling and “tangab.”	Implementation of illegal fishing act strictly	Resolutions were already made and endorsed to the City Mayor
3. Hire a “Bantay Dagat.”	To create an organization known as “Bantay Dagat” and this could also add employment	
4. Create a Municipal Ordinance to put up boundary of non-Villa fishers and if possible issuance of ID	1. Draft a Resolution or Ordinance to make the boundary legal 2. Will implement strictly if the city government will create ordinance	
5. Always remind the public during village meetings not to dump garbage near the shore.	1. Put signage 2. Fine for those who will get caught throwing garbage anywhere	Fisherfolks were already reminded every general assembly
6. Penalize fisherfolks caught doing illegal fishing.	Create Ordinance to penalize illegal fishers	
7. There should be seasoning of fishing so that fishes will have time to spawn but see to it that somebody is roaming around to prevent fisherfolks from fishing.	NA (Not Applicable). No idea for spawning of fishes.	

## IMPLICATIONS

This study envisioned to increase fish productivity in Villa, Iloilo City, Philippines if both the fisherfolks and the LGU's help each other. A follow-up study should be done if the plans of action of the LGU's were met. These plans will take years to realize and not a snap of a hand. The thing is, it is being started and it is already in the hands of the government to implement laws or policies.

Table 4. Suggestions of fisherfolks in Villa, Iloilo City, Philippines to increase fish yields, plan of actions, and actions taken of LGU (City Government)

<b>Suggestions of Fisherfolks</b>	<b>Plans of Action</b>	<b>Actions Taken</b>
1. Put up artificial reefs but not open for fishing.	1. Identify a permanent area to be declared MPAs not affecting the fisherfolks' fishing grounds. 2. Recommend the establishment of Fish Sanctuary.	1. Already implemented having sustainability problem due to coastal condition or characteristics
2. Create a Municipal Ordinance to stop the use of trawling and "tangab."	1. Enforce the City Ordinance on these gears. 2. Gather information/data to formulate additional ordinance when necessary 3. Surveillance of Village Bantay Dagat and Fish Warden.	1. The City has already a regulation ordinance in these gears. 2. Contained in R.O. 2003-233
3. Hire a "Bantay Dagat."	1. Continue the Bantay Dagat program. 2. Activate team composition through an Executive Order. 3. Reactivate BFARMC and Bantay Dagat	1. "Bantay Dagat" of the City is active except for a limited activity in the coastal water where fishing activities are very minimal. 2. Focus of existing team is not in coastal zones due to lack of equipment
4. Create a Municipal Ordinance to put up boundary of non-Villa fishers and if possible issuance of ID	1. Establish a permanent marker 2. Implement of the ordinance	Done already through the City Ordinance
5. Always remind the public not to dump garbage near the shore during village meetings.	1. Require participation of fisherfolks to address the concern 2. Conduct Information Education Campaign 3. Encourage and influence residents for proper garbage disposal.	Massive activity is regularly implemented

6. Penalize fisherfolks caught doing illegal fishing.	Strict enforcement/ implementation of the Philippine Fishery Code	R.A. penalizing the illegal fishing is already enacted
7. There should be seasoning of fishing so that fishes will have time to spawn but see to it that somebody is roaming around to prevent fisherfolks from fishing.	<ol style="list-style-type: none"> <li>1. Access with BFAR-NSAP data base to formulate plan of action</li> <li>2. Enforcement is needed</li> <li>3. Information education campaign on Fish Conservation</li> </ol>	<ol style="list-style-type: none"> <li>1. Informational data gathering (BFAR-NSAP)</li> <li>2. There is a law RA 8550 on the regulation.</li> </ol>

### TRANSLATIONAL RESEARCH

This research is best understood by converting the plans into Hiligaynon and will be given to the JBLFMU-Arevalo Community Extension Officer for information of the fisherfolks and the local government units through a forum and/or core group assembly.

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