

Research Note

Are Several Village-based Marine Protected Areas (MPAs) Necessary for Conserving Coastal Resources in a Municipality? A Case of Municipality of Gonzaga, Cagayan, Philippines

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Abstract

This research examined the necessity of establishing several village-based MPAs as management strategy in conserving coastal resources in a single municipality through comparative assessment of the 2 marine protected areas in the municipality of Gonzaga, Cagayan, Philippines. For data collection, key informant interview was conducted on the establishment of MPAs and clarification on its current conditions. In addition, a household survey in the 2 MPA sites (San Jose and Casitan) was accomplished in March 2015 through one-on-one interview conducted by trained enumerators. A total of 250 respondents were selected by random sampling from the List of Registered Household Heads. Socio-economic conditions, fishing profiles, and knowledge, awareness and approval on the presence of MPAs were elicited using structured questionnaire.

Results showed that development process on the establishment of respective MPAs and its management structures is almost the same in both villages. It was noted however, that the major differences in the 2 villages include: size (land area) and location with respect to marine resources, income level and discrepancy, occupational structure, fishing style and knowledge on the purpose of MPA. Considering these variances, the study concludes that establishing MPAs situated in respective villages is an ideal approach for coastal resource conservation in the municipality. Difficulty in consensus building and free riding can be minimized when residents managed their own resources. Inhabitants of the same village has higher intensity of socio-economic and cultural similarities so management will be easier especially when done in voluntary manner. Lone MPA encompassing several villages within a municipality may lead to demanding consultations and resource user's conflicts therefore needs a more structured governance. Considering these social parameters is important in promoting sustainable use of resources through MPAs.

Keywords: Cagayan, coastal resource management, MPA, participatory approach, village-based MPAs

Introduction

Marine Protected Area (MPA) has at its pinnacle in the last few years. It is considered as an important tool for fisheries conservation and management. The increasing numbers of MPA worldwide reflects recognition of their utility as an integral component of initiatives to conserve marine biodiversity and fisheries resources (Pauly *et al.*,

2002). In the Philippines, MPAs have been established as a response to the destruction of coastal habitats as well as decline in fisheries productivity (White *et al.*, 2004). MPA, which can either be a marine park, reserve, refuge, and or sanctuary, is a general term for sites whose boundaries have been established in order to provide certain level of management with the main objective of protecting the site's natural resources (Philippine Coastal

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Management Guidebook No. 5, 2001).

The Municipal or City Government has been active in this endeavour as the Philippine Fisheries Code devolve to them the primary responsibility of protecting and managing their coastal and marine resources within their respective municipal waters which include fishery resources up to 15 km from its shoreline. As a measure to protect and improve its marine resources, municipalities established village-based MPAs through community-based participatory approach. Village-based MPAs are MPA programs directly managed at the *barangay* (local term for village, the smallest administrative unit in the Philippines) level which are primarily run either by a people's organization or by a *barangay* council (San Juan, 1999). Community-based, as defined by Crawford et al (2000) refers to a co-management regime between local residents or community groups working together with local government in the planning and implementation phases.

A common Philippine MPA model established by the municipality is a marine reserve with a fish sanctuary or "no-take" zone. Marine reserve is an area where fishing and other activities are allowed but regulations are set to control access while the fish sanctuary or "no-take" zone is a region where all extractive practices, such as fishing, shell collection, seaweed gleaning, and collecting of anything else including human access is prohibited (Philippine Coastal Management Guidebook No. 5, 2001).

The Integrated Coastal Resource Management Program (ICRMP) - MPA Database recorded 7 village-based MPAs situated in 4 municipalities in Cagayan, a province in the northern part of the Philippines. Out of these MPAs, 3 were located in a single municipality. Many researches were conducted to determine appropriate size and numbers of MPAs, debating from huge areas (Walters, 2000) to small reserves (Roberts *et al.*, 2003). In a study conducted by Shinbo *et al.* (2014), an MPA encompassing seven villages showed higher monitoring and organization cost compared with village-based MPAs. This study, therefore attempts to investigate the necessity of establishing several village-based MPAs for conservation of coastal resources in a municipality through a comparative study of the 2 selected among the

3 MPAs in the municipality of Gonzaga, Cagayan, Philippines.

Study Sites and Methodology

1. Study Sites

The municipality of Gonzaga (Fig.1) is geographically located in the north-eastern tip of Cagayan Province in northern Philippines which is located in the path of Kuroshio Current. It is enclosed by the municipalities of Sta. Ana on the east, Sta. Teresita on the west and Lallo on the south. Gonzaga's 15 km municipal water boundaries include areas of the Babuyan Channel on its north, Pacific Ocean on its east and Mission River on its west.

Gonzaga is politically subdivided into 25 villages, 11 of which are in the coastal area. According to its municipal profile, it has a land area of about 56,700 ha and a coastline of 40 km which makes the economy primarily agriculture and capture-based fisheries. From the 2008 Participatory Coastal Resource Assessment (PCRA) data, its coastal resources are comprised of 69 ha mangrove forests, 348 ha coral reefs, 23 ha seaweed meadows and 5 ha seagrass beds.

The municipality experienced issues on illegal and indiscriminate fishing hence, to protect its coastal resources from further exploitation and degradation, it defined and proclaimed 3 village-based MPAs within its municipal water. Since one (Tapel MPA) is relatively new, the research design focused to compare the 2 MPAs which were conceptualized on the same year - the San Jose and Casitan MPAs which were established through Municipal Ordinance No. 09 series of 1999. The 2 MPAs lies on the extreme sides of the municipality with San Jose on the eastern part while Casitan is on the western side (Fig. 1).

The snorkel survey data conducted in 2008 confirmed that San Jose has 78% live coral cover and Casitan has 51% compared to other coastal villages that the existence of coral reefs can only be observed through rubbles and remnants. Coral reefs is one of the essential ecosystems as it provide habitats and sanctuary to many marine organisms. Numerous fish spawn in coral reefs and serves as refuge to juvenile fish. In order to safeguard and secure these resources, MPAs were established in

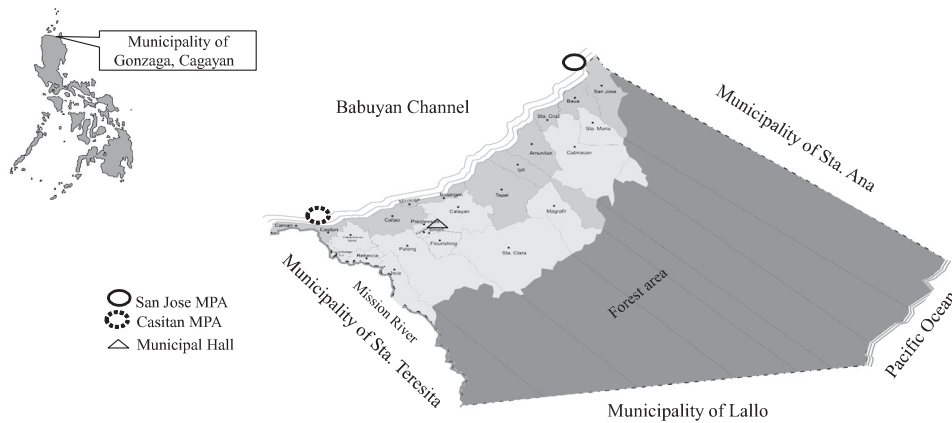


Fig. 1. Map showing the location of the 2 village-based MPAs in Gonzaga, Cagayan, Philippines (source: Modified from the LGU Coastal Map, Municipal Coastal Environment Profile Tapel MPA is located between the 2 MPAs).

these villages.

San Jose MPA has a total area of 342.35 ha with a no take zone of 72.28 ha while Casitan MPA has a total area of 146 ha and with a no take zone of 42.32 ha. The MPAs are being managed by San Jose Fisherfolk Association (SJFA) and Casitan MPA Development Association (CAMPADA) respectively.

2. Methodology

To get an overview of the MPAs in Cagayan Province, a recognition survey was conducted from August 4-6, 2014. The visit provided preliminary information and insights on the established MPAs.

To substantially compare and get in-depth information on the 2 village-based MPAs in Gonzaga, a key informant interview was conducted on March 1 - 4, 2015. The key informants consist of village officials, officers of fisherfolk associations, *bantay dagat* (sea guards) and employees of Municipal Agriculture Office (MAO) provided significant information on the establishment and current status of MPAs, village economy and interactions within the community.

In order to have a baseline information on the socio-economic conditions, fishing profiles, and knowledge and awareness on MPA, a household survey using structured questionnaire was conducted on February 28- March 2, 2015 in San Jose and on March 7-9, 2015 in Casitan. Respondents (San Jose=150; Casitan =100), representing about 50% of household population, were selected by

random sampling from the List of Registered Households Heads in each village. Eight trained enumerators who are familiar with the local dialect, *Ilocano*, assisted in the data gathering through one-on-one interview. The questionnaire contains inquiries on demographic characteristics, annual household income and its sources, fishing assets and practices, and knowledge, awareness and approval on the presence of MPAs.

Another key informant interview was conducted on the follow-up survey on September 8- 11, 2015. Aside from the key sources in the 2 villages who verified the initial data gathered, representatives from the Office of the Provincial Agriculturist (OPAg) and Bureau of Fisheries and Aquatic Resources (BFAR) confirmed the facts and enriched the data collected.

Examination of documents such as municipal ordinances, MPA Management Plans, and other technical reports was done to enhance the accuracy of information.

Results and Discussions

1. Development Process of MPA Establishment

Basing on the accounts of key informants and review of MPA Management Plans, the development process of the establishment of the 2 MPAs in Gonzaga is mainly divided into three major steps. The first step is considered the preparatory period by official procedures. After the approval of the Philippine Fisheries Code in 1998, the municipality of Gonzaga created its Basic Municipal Fisheries Ordinance (Municipal Ordinance No. 09) in

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1999. The municipal ordinance identified portion of the coastal areas of San Jose and Casitan to be part of the 15% municipal waters intended for reserves and sanctuary as part of the municipality's coastal resource management initiatives. Hence, the outset of MPAs in both villages were initially state-initiated through its local government.

However, the development process as shown in Table 1 was community-based participatory approach facilitated by external agents in the form of National Government Agencies (NGAs) such as BFAR and Department of Environment and Natural Resources (DENR) and of Local Government Units (LGUs) like the Provincial Government of Cagayan through OPAG and Municipal Government of Gonzaga through MAO. Despite its declaration as MPAs in 1999, it was only in

2002 and 2004 that the state of its resources were evaluated through PCRA conducted by DENR and found out that Matara Reef in San Jose has a good coral cover. From the period of 2005 until 2007, the municipality took care of its coastal resources since the community participation has not yet fully operationalized.

With the commencement of the Integrated Coastal Resource Management Project (ICRMP) in 2007, funds became available for the implementation of activities focusing on enhancing sustainable management of coastal resources. The ICRMP is a six-year project implemented by the DENR, BFAR and LGUs. The 2 MPAs were part of these initiatives, therefore, the progression continued in that year.

The second step of the development is considered the adoption period of MPAs in the respective villages.

Table 1. Timeline showing the milestone in MPA developmental process.

Year	Highlights of Events	Remarks
<i>1st step:</i>		
1999	Passage of Municipal Ordinance declaring the MPAs	Section 50 of Basic Municipal Fisheries Ordinance of Gonzaga (Municipal Ordinance No. 9, s. 1999) declared portion of municipal waters covering <i>barangay</i> San Jose and Casitan as marine reserve
2002	Validation of coral reef and reef fishes resources in San Jose	Conducted by DENR and identified Matara Reef to have a good coral reef cover
2004	Conduct of PCRA	Carried out by DENR in both villages
<i>2nd step:</i>		
2007	Consultative meeting with the community and Organization of Fisherfolk Association	Executed by the OPAG under their CRM Program (SJ - March; C - June)
	Training on MPA Establishment and Management	Implemented by OPAG with 82 participants in San Jose and 57 in Casitan (SJ - March; C - July)
	Validation of boundary of municipal fish sanctuary and reserve/ Assessment and delineation of the MPAs	Carried out by OPAG, DENR, BFAR and LGU; realized smaller and manageable area compared with the coordinates in the Municipal Ordinance (SJ - March; C - July)
	Fishery Law Enforcement Training and deputation of members as fish wardens	Conducted by BFAR and deputized 47 and 54 fish wardens from San Jose and Casitan respectively (SJ - May; C - August)
	Awarding of Livelihood projects (1):	
	Payao	40 units artificial reef modules and 1 unit payao to both villages (SJ - June; C - October)
	Mushroom Culture	1 mushroom house with 2 units seedling beds to both villages (SJ - August; C - March 2008)

continuation: **Table 1. Timeline showing the milestone in MPA developmental process.**

Year	Highlights of Events	Remarks
3rd step:		
2007	Launching of MPA Project	MPA signboards are likewise installed in both villages
2008 - 2009	Coastal resource assessment through community participatory approach	Conducted by BFAR, DENR and LGU under the ICRM Program (SJ - October; C - 2009)
2010	Conduct of Rapid Underwater Assessment	Carried out by DENR, BFAR and LGU in both MPAs
	Awarding of Patrol Boats	1 unit is awarded by LGU to each village for MPA monitoring and surveillance
	Awarding of Livelihood Projects (2):	
	Seaweed Culture	Provided by BFAR to SJFA
	Fish Trap	Provided by BFAR to SJFA
2011	Ecotourism: Reef Discovery	Provided by DENR to SJFA
	Ecotourism: Nature Village	Provided by LGU to SJFA
	Formulation and adoption of MPA Management Plan	SJ - Resolution No. 226 -2011; C - Resolution 227 – 2011 (with new MPA boundaries and coordinates)
	Awarding of Livelihood Projects (3):	
2012	Lying-in cage culture of sea urchin and lobster	Provided by BFAR to both POs
	Fish Paste Production and Fish Trading Project	Provided by BFAR and DENR to SJFA
	Hog Raising and Fattening	Provided by BFAR to CAMPADA
2013	Culture of sea cucumber	Provided by DENR to CAMPADA
2014	Abalone and oyster culture	Provided by BFAR and DENR to SJFA

Source: MPA Management Plans and Key informants accounts

Note: PCRA - Participatory Coastal Resource Assessment; SJ - San Jose; C - Casitan
 CRM - Coastal Resource Management; ICRM - Integrated Coastal Resource Management
 DENR - Department of Environment and Natural Resources; BFAR - Bureau of Fisheries and Aquatic Resources
 OPAG - Office of the Provincial Agriculturist of Cagayan; LGU - Local Government Unit of Gonzaga
 PO - People's Organization; SJFA - San Jose Fisherfolk Association; CAMPADA - Casitan MPA Development Association

Technical staff from the OPAG conducted a consultative meeting with the community and presented its Coastal Resource Management (CRM) Project for both villages which include the establishment and implementation of MPAs. The fisherfolk associations were organized and identified as the people's organizations (POs) to manage the MPAs-the SJFA in San Jose and the CAMPADA in Casitan. Trainings were conducted to build capacity of stakeholders in managing the MPAs. Members of the associations were deputized as fish warden and act as *bantay dagat*. *Bantay dagat* or sea guards, is a participatory approach designed for coastal law enforcement which has existed in the Philippines since the 1970s (GTZ, 2003).

Validation of the boundaries, assessment and delineation of the MPAs were carried out by the POs,

municipality and external agents. This results to a smaller and manageable area compared with the original coordinates in the Municipal Ordinance. The new MPA boundaries and coordinates were included in the Management Plan.

Initial set of livelihood projects, which served as incentives for their participation in coastal resource management, were also provided to these POs. For the fisheries-based project, each PO received fish aggregating device (FAD) which is constructed for the purpose of facilitating the aggregation and attraction of fish for easier harvest. The FAD provided was composed of 40 modules of artificial reef and 1 unit payao. In addition, 1 unit mushroom house with 2 seedling beds were given by OPAG as non-fisheries-based project. With these accomplishments, the 2 village-based MPAs were

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formally launched in October 2007.

The third step of the development process is the implementation period at each site. In 2008, BFAR in collaboration with DENR, was commissioned to conduct coastal resource assessment through community participatory approach through the ICRMP. Results of these assessments revealed that much of the coastal and marine resources of the municipality can be found in San Jose. San Jose covers a beach area of 43.20 ha, mangrove forest of 21.28 ha, coral reef covers of 68 ha, seaweed meadows of 14 ha and seagrass beds of 2 ha. Casitan on the other hand, covers a beach area of 9.8 ha, coral reef covers of 47 ha and seaweed meadows of 1 ha.

Furthermore, in 2010, a rapid underwater assessment was jointly conducted by DENR, BFAR and the municipality of Gonzaga in both sites. In the same year, the municipality awarded 1 unit patrol boat to each fisherfolk associations for use in the monitoring and surveillance around the MPAs. The *bantay dagat* members of the corresponding associations operate and maintain the patrol boats while the municipality provides

the fuel used during patrolling. Seaborne patrolling is done on a weekly basis, however *bantay dagat* members are always conscientious and observant for any illegal fishing activities within their vicinity.

To ensure the proper implementation of both MPAs, MPA Plan preparation workshops, presentation and validation to the community was done in 2011 in both sites. After thorough preparation, the respective village officials endorsed the Management Plan to the *Sangguniang Bayan*, the municipality's legislative body for its adoption. The respective Plans were approved under Resolution No. 226 s.2011 for San Jose MPA and Resolution No. 227 s.2011 for Casitan MPA.

As part of BFAR's regular program and the Enterprise Development and Income Diversification Component of ICRMP, livelihood projects such as seaweed and oyster culture; fish traps, fish paste production, sea urchin and lobster lying-in project were awarded to SJFA while CAMPADA received sea cucumber and milkfish culture, sea urchin and lobster lying-in project and hog raising from 2010-2014.

Table 2. Village profile and socio- economic characteristics of respondents.

Parameters/Barangay	San Jose	Casitan
A. Barangay Profile		
Number of Household (HH) (as of 2014)	322	185
Total Population	1408	805
Land Area (ha)	9,914.22	949.43
Coastline (km)	13.9	2.8
Distance from town proper (km)	16.5	9.5
B. Socio-economic characteristics of respondents		
Sample (Respondents)	150	100
Average HH size	4 - 5	4 - 5
Average Age	48	45
In-migrants (%)	42	19
Average years in the village (yrs)	38.33	41.21
Educational attainment ^a	3 - 4	3 - 4
Average Total HH Income ^b (Php)	121,000	114,500
Average HH Income per sources (% from the total HH income)		
Fishing	38	23
Farming	17	28
Hog Raising	3	1
OFW Remittance	6	10
Wage Earner	10	21
Small Enterprise	5	6
Market Vendor	5	3
Laborer	9	6
Tricycle/Multicab Driver	7	2

^a1-No education; 2-Elementary Level; 3- Elementary Graduate; 4-High School level;

5-High School Graduate; 6-College Level; 7-Vocational Graduate; 8-College Graduate; 9- Post Graduate

^b1 USD= Php 44.64 (Exchange Rate in March 2015)

Moreover, in the implementation of the Biodiversity Conservation component of the ICRMP, the DENR also provided assistance for the ecotourism projects (*Reef Discovery* and *Nature Village*) and grow-out culture of abalone to SJFA and culture of sea cucumber project to CAMPADA from 2011-2013.

2. Socio-Economic Conditions and Fishing Profile of Respondents

A. Socio-economic conditions

As per respective 2014 Village Profile, number of household in San Jose is 322 with a total population of 1,408 while Casitan has 185 households with population of 805. Based from the Municipal Coastal Environmental Profile, San Jose is a bigger village with a total land area of 9,914 ha and coastlines of 14 km while Casitan covered 949 ha land area and 2 km coastlines.

Table 2 summarizes the village profile and socio-economic characteristics of respondents. The average household size in both villages is between 4 - 5. Forty two percent (42%) of respondents from San Jose and 19% from Casitan are in-migrants. Reasons for moving is either marriage or job hunting giving an average years of residency of 38 years in San Jose and 41 years in Casitan.

Average age of respondents is 48 and 45 years old in San Jose and Casitan respectively. Further analysis of household age data generated the information shown in Table 3. Casitan is relatively young community having a

lower median age of 24, 22.4 ageing index and 6.76% senior citizens compared with San Jose with median age of 29, 28.8 ageing index and 7.90% senior citizen. This also translates to higher dependency ratio in Casitan (50) compared with San Jose (46). This means that San Jose has higher productive force (15-64 years old) among its population. Majority of the respondents are functionally literate having the chance to attend schools at an average of 7 years of education.

In terms of economic conditions, average annual household income in San Jose is Php 121,000 (1 US \$ = Php 44.64 in March 2015) and a modal income of Php 60,000. Results confirms that the villagers earn 49% less than the national average (Php 235,000) and 38% less than the regional cohort (Php 195,000) (FIES, 2012). In Casitan, average annual household income is Php 114,500 and modal income of Php 52,000. Income in the village is 51% lower than of the national and 41% lower of the regional average.

Casitan is relatively rich community having a higher median income (Php 92,000) compared with San Jose (Php 84,000). This also translates to wide income disparity in San Jose with a Gini coefficient of 0.4565 while Casitan has 0.3983. The Philippines has a Gini coefficient of 0.4605 while the region (Cagayan Valley) has 0.4096 (FIES, 2012). Fig 2 illustrates the comparative distribution of annual household income in the 2 villages.

On income composition, most of respondents from

Table 3. Age structure of HH population in the two villages.

Parameters	San Jose	Casitan
Median Age ^a	29	24
Sex Ratio ^b	97m: 100f	103m: 100f
Over-all Dependency Ratio ^c	46	50
Ageing index ^d (%)	28.8	22.4
School Age ^e (%)	30.0	41.3
Voting Age ^f (%)	66.4	62.3
Senior Citizen ^g (%)	7.9	6.8

^a age that divides the population into two numerically equal groups, that is, half of the population are younger than this age and the other half are older

^b number of males per 100 females in a given population

^c number of persons under 15 years old (young dependents) and persons aged 65 and older (older dependents) per 100 persons 15 to 64 years old (working-age group)

^d number of persons 60 years old and over per one hundred persons under the age of 15 years

^e percentage of population with age ranging from 5 to 24 years old

^f percentage of population with age 18 years old and above

^g percentage of population with age 60 years old and above

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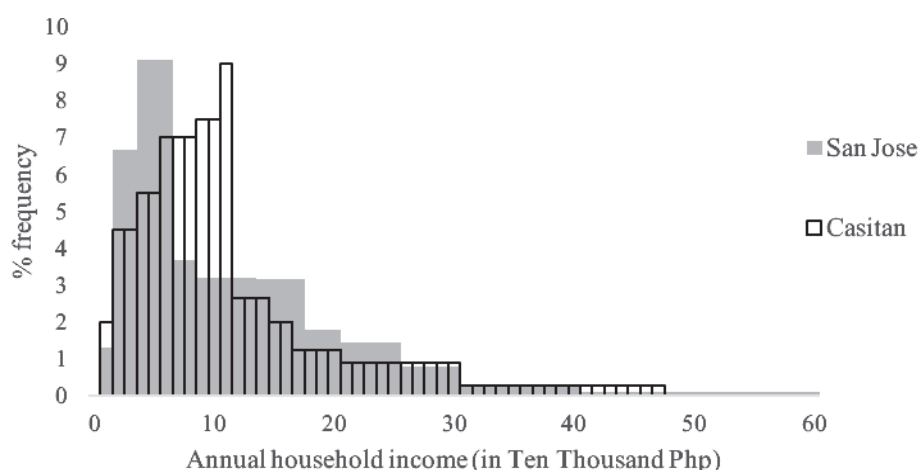


Fig. 2. Comparative distribution of annual household income in the 2 villages.

San Jose rely from farming (28%) as the major source of household income followed by fishing (23%) and wage from regular job (21%). A tangible number (10%) of respondents depend from remittance of household member working abroad.

Whereas, in Casitan, 38% of household income comes from fishing, 17% from farming and 10% from salary earnings. It can therefore be deduced that Casitan villagers depend more in marine and coastal resources having bulk of household income emanates from fishing. Other sources of income in both villages include: small enterprise, market vending, labourer, and driving.

B. Fishing Profile

Table 4 displays the profile of fishermen-respondents. Thirty four percent (34%) of the respondents from San Jose were fishermen and only 41.18% of these are full-time fishers as others engaged in supplementary jobs for additional source of income. Of these fishers, 54.9% own fishing boats (74.19% are

motorized fishing boats) and 68.63% own fishing gears. Those who do not own boats and gears join other fishermen in fishing and share with the income. Average years of income from fishing is Php 82,800.

In Casitan, 70% of the respondents were fishermen, however, only 37.14% works on full-time basis because only 18.57% own fishing boats and 32.86% possess fishing gears. Most of fishers were hired workers of beach seine owners in the community. This situation translates to lower average income (Php 62,400) from fishing.

It was learned during the survey that beach seine fishing is practiced in Casitan. Beach seine, an active gear, is considered as a traditional fishing gear in the locality hence its operation is allowed. Beach seine owners, employing about 30-40 fishers in their fishing activities is recognized as a powerful fishers in the village. From only 3 units prior to establishment of MPA, a total of 7 beach seine is now operating with permit in the municipal waters of Gonzaga and nearby municipalities.

Table 4. Profile of fishermen-respondents.

Parameters/Barangay	San Jose	Casitan
Fisherman ^a (%)	34	70
Full time fisherman ^b	41.2	37.1
With Fishing Boat ^b	54.9	18.6
Motorized Fishing Boat ^c	74.2	73.3
With Fishing Gears ^b	68.6	32.9
Average years in fishing	24	20
Average HH income from fishing ^b (Php)	82,800.00	62,400.00

^a from all respondents

^b from fishermen respondents

^c from fishermen with fishing boats

The fishers acknowledge that the increase in fish catch is due to the spill-over effect of MPA. Due to differences in beach formations, no beach seine operation is observed in San Jose, instead round haul seine is used in the village. Common fishing gears used by fishers from both villages include gill net, hook and line and spear.

3. MPA Management System

A. Management structure

Both MPAs are under a co-managed MPA system; where-in the management is a shared responsibility between the municipality and the fisherfolk associations. The municipality, however, provide independence to the fisherfolk associations in decision making particularly on MPA policies and rather maintain passive role of providing logistic support.

Under its MPA Investment Program, the municipality of Gonzaga provides priority funding to fisherfolk organizations for the effective management of the protected area. It also allocates appropriation from its internal revenue allotment (IRA) for the management of the MPAs. It also provides technical support through its MAO. The Municipal Fisheries and Aquatic Resources Management Council (MFARMC), a recommendatory body composed of municipal fisherfolk and other stakeholders, assists in the enforcement of fishery laws and acts as advisory body of the local government in fishery matters including MPAs.

In coordination with the municipality, BFAR, DENR and OPAG assist the fisherfolk associations in technical matters and provide necessary capability building activities to sustain operation of MPAs. Fig. 3 illustrates the management structure in both MPAs.

Although the respective fisherfolk associations are the primary POs assigned to oversee the MPA management in the villages, the involvement of the village officials is an advantageous element in effective supervision of MPAs. The village officials have immense participation particularly in the endorsement of MPA policies to the municipality as well as law enforcement. Village officials in both areas showed positive support to the objectives of MPAs.

To effectively address imperative issues in the management of the MPAs, four (4) working committees

within the fisherfolk associations were formed. These committees include: (1) Law Enforcement Team; (2) Core Monitoring Group; (3) Income Generating Project (IGP)/Ecotourism Unit and (4) Information Education Campaign (IEC) Team.

The Law Enforcement Team is composed of the members of the fisherfolk associations who were deputized as fish wardens and therefore act as *bantay dagat*. The LGU provided patrol boat for both MPAs and cover the fuel cost but members do the patrolling in voluntary manner. The group divide themselves into small teams of 4-5 members for specific schedule for 3-5 hours land surveillance or sea borne patrolling. Despite of absence of monetary incentives, *bantay dagat* members actively and persistently do their jobs. From the year 2008 to 2012, 5 *bantay dagat* members of SJFA and 3 of CAMPADA were awarded as Outstanding Deputy Fish Warden by BFAR due to their invaluable contribution in the protection of the marine environment.

The Core Monitoring Group, in coordination with the technical staff from the external agents, conducts annual monitoring and assessment of the coastal and marine resources inside and outside the MPA. They also spearhead the implementation of conservation activities like stock enhancement. The IGP/Ecotourism Unit is in-charge in the supervision of the implementation of alternative livelihood projects provided to the associations while the IEC Team spearhead the conduct of information drive in the community.

Although management structure is the same in both villages, the municipality cannot just simply establish 1 big municipal MPA. Because in doing this, it will encompass several coastal villages which may not meet the basic criteria for MPA site. A site commonly selected to be an MPA should have at least high biodiversity index which is vulnerable to devastation and presence of important ecological habitats such as coral reefs, mangroves and seagrass (Philippine Coastal Management Guidebook No. 5, 2001).

In addition, difficulty in consensus building among the villages that will be covered, social acceptance among many displaced fishers, and management structure will be a challenge. This in consonance with the finding of Shinbo et. al (2014) that it is necessary to have a well-

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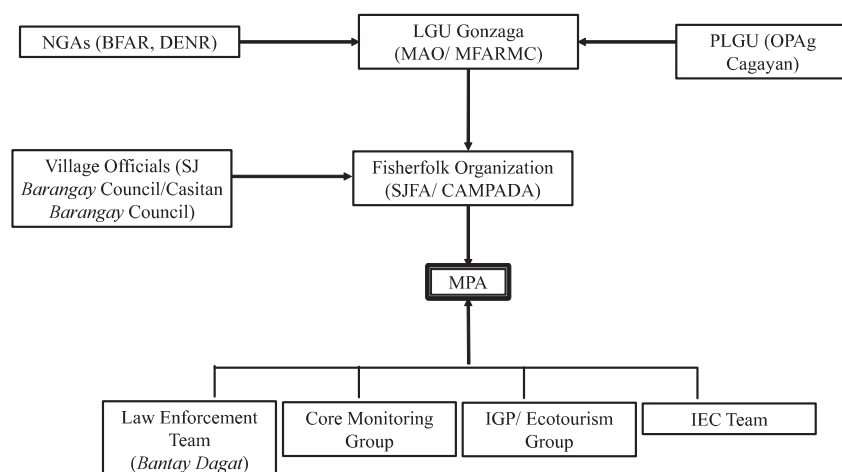


Fig. 3. Management structure of the village-based MPAs.

Source: MPA Management Plans and Key informant interviews

Note: NGAs – National Government Agency; BFAR – Bureau of Fisheries and Aquatic Resources; DENR – Department of Environment and Natural Resources; LGU- Local Government Unit; MAO – Municipal Agriculture Office; MFARMC – Municipal Fisheries and Aquatic Resources Management Council; PLGU – Provincial Local Government Unit; OPAg – Office of the Provincial Agriculturist; SJFA – San Jose Fisherfolk Association; CAMPADA – Casitan MPA Development Association; IGP – Income Generating Project; IEC – Information Dissemination Campaign

designed multi-level governance which requires high cost of operation in an MPA which enclosed several villages.

B. Management Issues and Problems Encountered

The fisherfolk associations which are empowered to manage the MPAs is an important factor for the success of the program. However, both sites were not spared from issues and problems faced while implementing plans for respective MPAs.

Sustaining the memberships of the fishers to the associations is a major problem that confronted the groups. In the case of SJFA, only 45 out of the original 77 members are actively involved in management activities, while only 20 out of 41 initial members of CAMPADA are functioning. Members who efficiently discharge the assigned duties in specific committees, attend regular meeting and pay monthly and annual dues of the association are considered active. Same trends were observed in sustaining the enthusiasm of *bantay dagat* members in both MPAs. There are only 10 and 5 active *bantay dagat* in San Jose and Casitan respectively out of the original number of deputized fish wardens. Active *bantay dagat* are those who frequently conduct patrolling and execute responsibilities without hesitations.

The lack of incentive schemes certainly contribute to

the occurrence of this problem. Members invest time, effort and money in the association purely for moral obligation of taking care the resources. Presence of incentive system could strengthen and sustain the motivation of members. The effectiveness of the provision of livelihood projects as incentive to conservation activities is still under investigation. Social preparation and value formation should also be revisited.

The forceful and fair fishery law enforcement is also a tremendous challenge to the associations. High degree of kinship and strong family tights is typical in the villages. This resulted in conflicts among members in Casitan MPA. It is therefore necessary to have a mechanism to resolve disputes when conflicts arise in MPA management.

C. Knowledge on the purpose of, awareness and approval on the presence of MPAs

The study explored the respondents' knowledge on MPA and awareness on its presence in the community as presented in Table 5. Respondents from Casitan were generally familiar about MPA (94%), aware on its existence in the locality (100%) and know where it is (96%) while only 76% from San Jose know what is an MPA, 90% were aware of its existence in the village and

Table 5. Knowledge, awareness and support of respondents towards their MPAs.

Questions	San Jose		Casitan	
	Yes (%)	No (%)	Yes (%)	No (%)
1. Do you know what an MPA is?	76	24	94	6
2. Are you aware on the presence of MPA in your village?	90	10	100	0
3. Do you know where the location of MPA in your village is?	85	15	96	4
4. Are you in favour of the presence of MPA in your village? ^a	72	17	81	13

^aundecided: San Jose = 11%; Casitan = 6%

85% know its location. This could be associated with the dependency of respondents to the marine resources. Many of the respondents from Casitan are fishers compared with San Jose. Respondents from Casitan can easily recognize the location of MPA within the community because the village is smaller and more compact than San Jose.

About 72% of the respondents from San Jose and 81% from Casitan revealed that they are in favour in the establishment of MPA. Respondents who agreed on the setting up of MPA believed that MPA contributes to increase chance of catching bigger fish, helps maintain natural habitat, develops recreation and tourism activities, adds livelihood sources and consider it as beneficial for the future generation. Respondents who disagreed on the formation of MPA mentioned that it reduced fishing grounds and source of user's conflict. Respondents who were undecided, reasoned out that they are not aware on the concept of MPA hence they are not sure in showing support.

Conclusion

With thorough analysis, it is clinched that the 2 villages differ in the following aspects: size (land area) and location with respect to marine resources, income level and discrepancy, occupational structure, fishing style and knowledge on the purpose and awareness on the presence of MPA. In view of these differences, the study conclude that establishing MPAs situated in respective villages is an ideal approach for coastal resource conservation in the case of the municipality of Gonzaga. Difficulty in consensus building and free riding can be minimized when residents managed their own resources within their specific zone. Residents permanently settled

near the MPA has higher intensity of socio-economic and cultural homogeneity so management will be easier. In addition, since management, monitoring and enforcement is by means of voluntary manner, it is essential that MPAs be managed by respective villages. Lone MPA encompassing several villages within a municipality may lead to demanding consultations and resource user's conflicts as social acceptance among many displaced fishers will be a problem. For a greater chance of successful implementation of resource management to its 40 km coastlines, it is necessary for the municipality of Gonzaga to establish several village-based MPAs within its coastal waters.

Cognizance to these societal parameters is important in promoting sustainable use of resources through MPAs. Findings of the study contributes to the basic socio-economic information in the area and will serve as guide in the policy implementation and enhancing coastal conservation initiatives in the villages.

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