

Perceived Benefits of FishCORAL-Related Coastal Resource Management Interventions in Ragay, Camarines Sur

ABSTRACT

The paper presents the assessment study aimed to (a) determine the level of awareness of the fishers on the Coastal Resource Management initiatives of the FishCORAL project in Ragay, Camarines Sur, (b) document the knowledge, attitudes, and practices of the fishers on coastal resources management (hereafter referred as 'CRM'), (c) identify the perceived socio-economic and ecological impacts of CRM initiatives, and (d) document the lessons to improve the implementation of fishery policies, programs, and plans for effective CRM initiatives. Using focus group discussion, key informant interview and observation methods, the present investigation depicted study revealed that respondents are extremely aware of the CRM interventions under the FishCORAL Project such as presence of markers in marine reserve and fish sanctuary, watch tower, Fishery Law Enforcement Team/bantay dagat operations, and patrol boat. Notwithstanding, Despite of significant increase in fish stock, as observed by the respondents, no positive impact yet was felt by the fisherfolks in terms of fish catch and income. Respondents, however, perceived the importance and future benefits of these interventions in ensuring sustainable fishery and other coastal resources of Ragay Gulf including the other ecosystem services it may offer to the coastal communities.

The study further revealed that illegal fishing and other prohibited economic activities within and nearby the fish sanctuary were curtailed due to the presence of installed buoy markers, established watch tower and seaborne surveillance/ patrol works. The availability of patrol boats and watch tower, which serves as Fishery Law Enforcement Team (FLET) headquarter, coupled with the regular manning or 24/7 monitoring by the Fishery Law Enforcement Team (FLET) considerably contributed in minimizing and/or gradual reduction of illegal fishing activities within the municipal waters of Ragay.

KEYWORDS: *perception, impact, coastal resource management, Ragay*

Comment [H1]: How do authors know fish stock increased? Where is the reference? If the work is not done by the author, then, they should mention the source of information clearly.

Comment [H2]: Clearly mention the resources.

1. Introduction

The Municipality of Ragay has a total population of 58,214 (PSA, 2015) and total land area of 40,022 hectares. It has thirty-eight (38) barangays and eight of which are located along the coastal areas with a total population of 12,215. The coastal barangays are Binahan Proper, Buenasuerte, Vabugao, Catabangan Proper, Lohong, Lower Omon, Tagbac, and San Rafael, which serves as fishing ground for 1,361 registered fisherfolks. Figure 1 shows the different barangays of Municipality of Ragay.

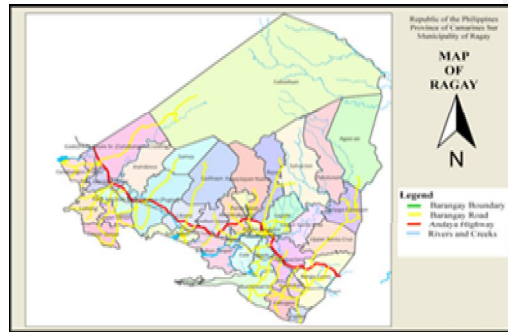


Figure 1. Map of Municipality of Ragay

As per the record of the Municipal Planning and Development Office of Ragay, there are 11,408 households with an average annual income amounting to Php 7,517.60 (CBMS, 2012). The top ten types of employment or sources of income of households are farming, fishing, government employment, trading/wholesaling, construction/ quarrying, public transport, retailing, food business, micro lending, and domestic service. The eight coastal barangays have its respective Barangay Fisheries and Aquatic Resource Management Council (BFARMC) and several fisherfolks organization. The Municipality of Ragay has active Fishery Law Enforcement Team (FLET) with trained and deputized members. In all its operations, the FLET is being assisted by the Municipal Agriculture Office in regular partnership with the Bureau of Fisheries and Aquatic Resources (BFAR).

Comment [H3]: Add reference.

The Municipality of Ragay has 29,085 hectares of municipal waters with an estimated 30.11-kilometer coastline traversing eight coastal barangays (CRM Plan Ragay, Camarines Sur 2019-2023). The 95.96 hectares of the municipal waters are designated as marine reserve and 26.56 hectares of which are delineated as fish sanctuary (Municipal Ordinance No. 032, Series of 1999). A total of 1,107 fishing gear units were recorded in the eight coastal barangays of Ragay and the capture fisheries utilized twenty-eight (28) distinct types of fishing gears classified into eight gear categories. Most fisherfolks utilized multi gears predominantly handlines (512 units or 46.25% of the total fishing gears recorded).

Almost all fishing gears were being operated year-round and catch rates of most fishing gears varied widely ranging from 0.5 kg/trip to as high as 750 kg/trip. The trip frequency and production contribution of fishing gears were greatly influenced by temporal seasonality. In general, more fishing trips and/or higher production contributions were recorded during the northeast monsoon or “amihan” season. In 2019, the computed share to annual municipal fisheries production of Ragay was 2,429.47 MT representing 12.47% of the total gulf production. The top 20 species of finfishes that comprised the bulk of fishery production in Ragay belongs to seven families, mostly pelagic fish.

The presence of multiple fishing gears and high fishing effort, about 70% of the species of finfishes caught in Ragay Gulf were subjected to exploitation. Thus, the Municipality recognizes the necessity to protect the municipal water and Ragay Gulf as a whole. Appropriate interventions are vital to ensure the judicious and wise utilization and sustainable management of the fishery and aquatic resources in the municipal waters for the benefit and enjoyment primarily by the residents of the municipality. With the enactment of its fishery ordinance, the municipality shall ensure the attainment of the objectives of its fishery sector namely, regulation of fishing effort, poverty alleviation, resource protection and regeneration, and institutional strengthening.

With the aim to reduce poverty in economically-challenged coastal communities, like Ragay Gulf, while strengthening local food and nutrition security in the target areas in the Philippines, the Fisheries, Coastal Resources, and Livelihood (FishCORAL) Project was implemented by the Bureau of Fisheries and Aquatic Resources (BFAR), under the Department of Agriculture (DA), in four regions and one of which is Bicol Region. Through the cooperation of local government units (LGUs) and the coastal communities, the project aims for the project sites to adopt sustainable management of the fishery and coastal resources as well as to increase the income of fishing households in the areas through sustainable engagement in diversified livelihood activities. This five-year development initiative (2016-2020) of the Philippine Government and the International Fund for Agricultural Development (IFAD) is composed of three components namely, Coastal Resources Management, Livelihood Development, and Project Management and Coordination.

Comment [H4]: Mention the same in abstract.

The present study is jointly conducted by the Bicol University and Central Bicol State University of Agriculture that primarily aimed to assess the various development activities implemented under the FishCORAL Project with emphasis on the perceived impacts of the coastal resource management initiatives to the fisherfolks and fishery sector of Ragay as a whole.

Specifically, the objectives of the assessment were to (a) determine the level of awareness of the fishers on the CRM initiatives of the FishCORAL project in Ragay, Camarines Sur, (b) document the knowledge, attitudes, and practices of the fishers on coastal resources management, (c) identify the perceived socio-economic and ecological impacts of CRM initiatives, and (d) document lessons to improve the implementation of fishery policies, programs, and plans for effective CRM initiatives.

2. Materials and Methods

Data and sources of data

The study relied both on the data generated from the secondary and primary sources. Major secondary sources include Coastal Resource Management Plan, Mangrove Management Plan, Municipal Fishery Ordinance, and FishCORAL Project accomplishment report. These are the major bases of information used in preparing the guide questions for the key informant interviews and focus group discussions. The Municipal Fishery Profile and

Participatory Resource and Socio-Economic Assessment of Ragay Gulf, Philippines 2019 (State of the Coast Report) were also considered as bases in primary data gathering and in preparation of this technical report.

Focus group discussion (FGD) was the main method employed to elicit the data needed in answering the study objectives. Key informant interviews were likewise used to get relevant information from the key officials of the local government unit and Fisheries Law Enforcement Team (FLET) or Bantay Dagat group who are involved in the implementation of the FishCORAL Project.

Majority of the respondents were members of the FLET and fisherfolks who are elementary to high school graduates. All FLET members have undergone several training related to coastal resource management (CRM) while some respondent-fisherfolks have neither attended training nor participated in any activities related to CRM.

Data collection procedure

Prior to the conduct of data gathering, series of coordination and courtesy calls were conducted to the Municipal Mayor’s Office, Municipal Agriculture’s Office and Barangay Local Governments of Binahan Proper and San Buenavista.

Review and analysis of various documents from the local government, particularly from Municipal Agriculture Office, were made to determine the CRM Initiatives (plans, programs, and policies) of the municipality including those covered by the FishCORAL Project.

On April 12 and May 15-16, 2021, three separate focus group discussions were conducted involving fisherfolks, FLET/bantay dagat, members of fisherfolks association and officials of the local government. Two FGDs were conducted in the Barangays of Binahan Proper and Buenasuerte, which were participated by fisherfolks, members of fisherfolks association and officials of the barangay. The FGD conducted in the office of the Municipal Agriculture were joined by members of the bantay dagat coming from different barangays namely, Lohong, Lower Omon, Ninahan Proper, Buenasuerte, Tagbac, Baoy, and Catabangan. The number of participants is as follows:

Table 1. FGD Venue and Participants

Venue	No. of Participants
a. Municipal Agriculture Office, Ragay Municipal Hall	14
b. Barangay Binahan Proper	12
c. Barangay Buensuerte	4

The Municipal Agriculture Officer, Agricultural Technician for Fisheries and FLET Leader cum Chairman of Municipal Fisheries and Aquatic Resources Management Council (MFARMC) were also interviewed as key informants. Similar guide questions was used both in the conduct of FGD and informant interview. The responses of all participants/ respondents were properly recorded per item as stated in the guide questions.

Comment [H5]: Provide images of the event in result section.

Qualitative responses on knowledge, attitudes, and practices

The data or information on knowledge, attitudes, and practices in relation to CRM were gathered during the focus group discussions, key informant interview, community observation, and documentary analysis.

3. Results and Discussion

Awareness on the CRM Initiatives of FishCORAL Project

All of the respondents were aware of the CRM initiatives being implemented by the Local Government Unit of Ragay, particularly the existence of fish sanctuary or marine protected area, watch tower, bantay dagat, and patrol boat. Twenty-four (24) respondents were aware that radio communication equipment is available and these were primarily being used by the FLET members or Bantay Dagat in their surveillance and apprehension activities.



Figure 2. The orange buoy markers installed in the Marine Reserve and Fish Sanctuary at Sitio Ogtoc, Barangay Buenasuerte

The 95.96-hectare Marine Reserve and Fish Sanctuary is situated at Sitio Ogtoc, Barangay Buenasuerte and its boundaries have orange buoy markers. These markers were provided and/or installed in 2019 by the Bureau of Fisheries and Aquatic Resources (BFAR) through its FishCORAL Project. As mentioned by some respondents, markers of the marine reserve and fish sanctuary were made of styrofoam and/or bamboo prior to FishCORAL Project.

The respondents were extremely aware of the watch tower that is situated at Sitio Ogtoc, Barangay Buenasuerte, nearby the Marine Reserve and Fish Sanctuary. It was constructed through the effort of BFAR and municipal local government through the FishCORAL Project.

As their counterpart, the Local Government Unit (LGU) of Ragay shared an amount of Php 200,000.00 for the construction of stairs of the watch tower. However, according to the Ragay Municipal Agriculturist, a watch tower was already constructed and maintained before by the local government prior to FishCORAL Project. The barangay officials and bantay dagat respondents were extremely aware that the tower located at Baranagay Buenasuerte was constructed through the FishCORAL Project while some, especially the fisherfolks, was unaware that it was part of the project instead they knew it was an effort by the local government unit.

Comment [H6]: Provide statistical analysis of the collected data

Comment [H7]: Data representation needs to be improved in the manuscript. Please provide graphical representation about the response by the respondents to the guide questions. It may improve the quality of the manuscript (Key parameters).

Comment [H8]: Provide the result in descriptive statistics form.

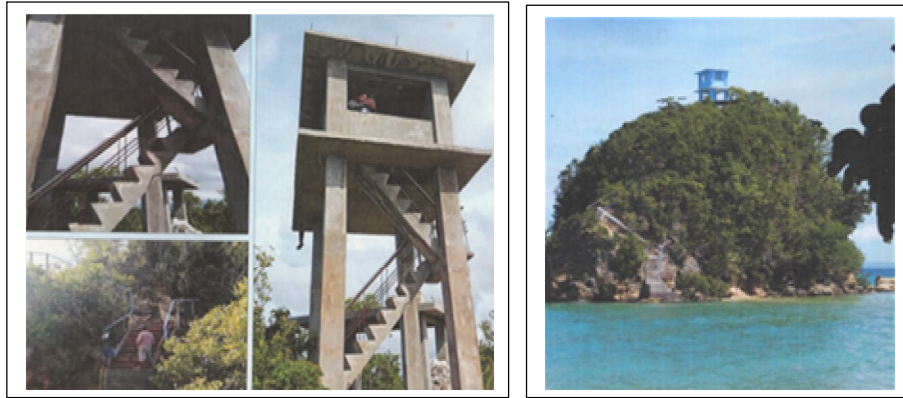


Figure 3. The constructed watch tower situated at Sitio Ogtoc, Barangay Buenasuerte

According to FLET members/bantay dagat, they have five (5) boats being used in the patrolling/ surveillance and regulation activities in the eight coastal barangays. Four (4) of these were from the local government while the other one was granted by BFAR under the FishCORAL Project. These boats are likewise provided with essential supplies for the patrolling activities. Maintenance and gasoline expenses are regularly provided by the local government to make these double engine patrol boats fully operational. However, the local government decided to designate one of these boats for activities related to tourism purposes.



Figure 4. Patrol boats granted/ provided for patrolling and regulation activities of the FLET

In addition, BFAR was able to provide boats, prior to FishCORAL Project, made out of fiberglass intended either for law enforcement and fishing activities.



Figure 5. The FLET members (bantay dagat) from the 8 coastal barangays

Presently, there are twenty (20) FLET members trained by BFAR and deputized by the local government. All of the 8 coastal barangays have active bantay dagat. According to Chief Bantay Dagat, the group of bantay dagat was organized and operating since 1996. However, officials and fisherfolks from Binahan Proper and Buensuerte responded that FLET/bantay dagat have been existing since 1980s.

At present, the FLET has 3 communication devices being used in their patrolling and regulation activities. These were provided by the local government. Some barangay officials and fisherfolks were, however, undecided whether the bantay dagat group has communication devices used in their law enforcement activities.

Comment [H9]: Mention the name of the device

Other Coastal Resource Management activities identified and conducted were establishment and maintenance of artificial breeding ground for corals, mangrove nursery and mangrove planting. The coral nursery was established in 2013 while mangrove nursery is continuously maintained at Barangay San Rafael. The Samahan ng Mag-iisda ng Barangay San Rafael was able to plant 100,000 of mangroves or a total of 3 hectares mangrove plantation using *Rhizophora* species.



Figure 6. Mangrove planting activities at Barangay San Rafael

Based on records, the municipal waters of Ragay were already delineated. However, according to the Municipal Agriculturist adjustments on demarcations will still be made to correct the actual boundaries based on the technical description indicated in the ordinance. The respondents from Binahan Proper were not aware with the delineated municipal waters of Ragay.

Comment [H10]: Add reference

Comment [H11]: What Kind of records? Mention reference

Knowledge, attitudes, and practices of the fishers on coastal resources management

As part of its institutionalization of CRM, the Municipal Local Government Unit of Ragay ensures annual appropriation for Fisheries and Coastal Resource Management activities. The allocation is primarily devoted to finance honorarium for Municipal Fisheries and Aquatic Resources Management Council and FLET members, travel expenses, fuel

expenses for seaborne patrol, capability building and partly for livelihood projects. Moreover, the Municipal Agriculture Office (MAO) regularly assisted in sourcing out additional resources and support (i.e. financial, technical, legal etc.) to augment and sustain the funds for fisheries and CRM initiatives. BFAR is always being tapped for financial and technical assistance, particularly in the operations and capability building of MFARMC and FLET.

In terms of sustainability mechanism, the monitoring and evaluation process of the municipality are in place and these were being conducted in collaboration with BFAR, fisherfolk association, and MFARMC/BFARMC. With this, the coastal resource managers including fisherfolks are properly informed and guided on how to cope up with the challenges and strategies to take on in ensuring effective implementation of various CRM activities.

Marine Reserve and Fish Sanctuary markers

The FGD participants were very familiar that a Marine Reserve and Fish Sanctuary is present and it is located nearby the constructed watch tower, which is situated at Sitio Ogtoc, Barangay Buenasuerte. But, they are not knowledgeable as to the total area of it. The area coverage was bounded by orange buoy markers. There were 12 markers installed under the FishCORAL Project, but, at present, only 6 are remaining.

All respondents were very knowledgeable of the purpose and benefits of the establishment and existence of the marine reserve and fish sanctuary. However, some of the respondents mentioned that consultation was not made prior to its creation. Knowledge influences awareness to behave and practicing conservation (Joos and Rogers, 2016).

The presence of marine reserve and fish sanctuary is known to all the fisherfolks including its location. All respondents were knowledgeable that fishing and recreational activities are prohibited within it. However, the area is open for activities related to educational or research purposes according to the Chief Bantay Dagat and Municipal Agriculturist. The location of the watch tower is believed to be strategic in ensuring proper conservation and protection of said sanctuary from any human illegal activities.

Watch Tower

All respondents were knowledgeable with the purpose and use of the watch tower that is for law enforcement as observational platform for surveillance operations by FLET in order to reduce illegal fishing activities in the municipal waters of Ragay. The tower is found at Sitio Ogtoc of Barangay Buenasuerte which is also serving as headquarters for the FLET. They believe that the location of the tower is very strategic as it helped them to monitor easily the fishing activities nearby sanctuary and/or within the municipal waters. The tower is being manned by FLET members on 24/7 schedule basis.

Patrol Boat

The local government has 5 patrol boats assigned to the Barangays of Lohong, Catabangan, San Rafel, Tagbak and Buenasuerte. FLET members in each barangay were

Comment [H12]: Do you mean 100%? Write in a scientific way, the paper mostly written like a popular article, not as scientific content. No scientific discussion, no graphical/tabular representation of data and also no descriptive statistics of different respondents and the parameter used to collect information.

Comment [H13]: Not relevant

Comment [H14]: Repeated many times. Change the phrase.

Comment [H15]: Give the coordinates of the watch tower

Comment [H16]: Same as H14 comments.

designated as care taker of said boats. Provisions for maintenance and operational costs are regularly included in the annual budget of the LGU-MAO. With these boats, FLET members believe that it strengthened their law enforcement activities especially in patrol works and apprehensions of illegal activities.

Bantay Dagat

The Municipality of Ragay has 20 deputized bantay dagat and all 8 coastal barangays were represented in the FLET. All respondents were knowledgeable that bantay dagat are trained and deputized fishers and involved in the law enforcement activities together with the LGU-MAO. The FLET was organized and operational since 1996. Since then, financial and logistical supports were regularly extended by the local government while BFAR regularly assisted in the capability building of FLET along law enforcement.

The respondents observed that bantay dagat are fully operational and following a shifting duty on a 24/7 schedule basis. However, some respondents like barangay officials and fisherfolks from Binahain Proper were not conversant on the schedule of patrolling activities of the FLET. Apart from LGU personnel, FLET is also assisted by BFAR in its patrolling and regulation activities. Respondents believed that bantay dagat play an important role in minimizing and/or eliminating illegal, destructive and encroachment of commercial fishers in the municipal waters.

Comment [H17]: How many?

Comment [H18]: Specify the percentage.

With regular budget for CRM initiatives, each bantay dagat usually received an honorarium amounting to Php 5,600.00 per month. Provision for patrolling paraphernalia and fuel supply were also included in the annual operations of the local government. As its additional role, FLET serves as partner of MAO and MAFRAMC in implementing other fishery and CRM activities like mangrove planting, coastal clean-up, livelihood opportunities among others.

Radio Communication

Majority of the respondents from Binahan proper were not knowledgeable on the existence of radio communication. They do not have the idea if FLET/ bantay dagat were using this device. However, two respondents (former bantay dagat and an official of fisherfolk association/ MFARMC) mentioned that some bantay dagat were equipped with radio communication needed in surveillance activities. On the other hand, bantay dagat respondents revealed that there were 3 functional radio communication devices that are being used by them in the patrolling/ surveillance operations.

Comment [H19]: Strictly specify the number or percentage. Prefer to give percentage value

Other CRM Initiatives

Establishment of artificial breeding ground for corals, mangrove nursery and mangrove planting were among the additional CRM activities implemented by the local government with the assistance from MFARMC, bantay dagat and fisherfolks association. The coral nursery was established in 2013 while mangrove nursery is maintained at Barangay San Rafael. The Samahan ng Mag-iisda ng Barangay San Rafael planted 100,000 of mangroves or

Comment [H20]: What species are used for nursery?

a total of 3 hectares mangrove plantation using *Rhizophora* species. The local government provided polyethylene bags to sustain mangrove seedling production while the association maintained the area. Coastal clean-up is annually conducted by LGU with the participation of FLET members, 4Ps beneficiaries and other stakeholders.

Comment [H21]: From where did you get the information? Specify as reference

Perceived socio-economic and ecological impacts of the CRM initiatives

Majority of the respondents observed a considerable increase in fish stock that may be attributed to the presence of marine reserve and fish sanctuary. However, no actual study conducted yet as to the impact of marine reserve and fish sanctuary to the status of fish stock in the area, according to the Municipal Agriculturist. The increase in abundance of fishes and improvement in coral reef condition cannot be achieved instantly after project implementation. It requires several years of dedicated protection and compliance in order to improve coastal resource condition (Maliao et al., 2009; Weeks et al., 2010). In addition, illegal fishing and recreational activities within fish sanctuary and immediate vicinity were minimized possibly due to the presence of installed buoy markers and established watch tower, as perceived by the respondents.

Comment [H22]: Author should provide the information that what status has been found in between 2013-2020. No information on fisheries stocks or coral restoration activities present in manuscript?

The buoy markers provided signal to fisherfolks that the area is prohibited to any fishing or economic activities. Presence of watch tower coupled with the regular shifting or 24/7 monitoring and surveillance operations of FLET to some extent resulted to gradual reduction of illegal fishing activities within the municipal waters. The availability of 5 patrol boats eases the regular surveillance of FLET and somewhat contributed in minimizing destructive and illegal fishing activities.

Generally, it was revealed that identified non-livelihood CRM initiatives such as buoy markers, watch tower, radio communication, and patrol boats under the FishCORAL Project have no significant impact yet to the catch and income of the fisherfolks. It can be noted that activities of said project were just introduced in year 2019, thus, impacts cannot be felt at the time the study was conducted. However, the respondents perceived the importance and future benefits of these interventions in ensuring sustainable fishery and other coastal resources of Ragay Gulf including the other ecosystem services it may offer to the coastal communities.

Lessons to improve the implementation of fishery policies, programs, and plans for effective CRM initiatives

Based from the observation and responses during the FGD, it can be deduced that local communities have limited knowledge and/or information to the CRM activities being introduced by the LGU, BFAR and other agencies or organizations. Though, some were aware of these initiatives but the details such as components, purposes, benefits, and beneficiaries were not fully clear to them. This low awareness and appreciation may be attributed to lack of prior project consultation and/or orientation with the coastal communities, thereby, resulting to weak community support and participation in the implementation. The engagement of stakeholders increases documentation of local knowledge, breadth of community awareness and participation in management processes (Aldon et al., 2011 and Andalecio, 2011).

Comment [H23]: How do the author says some were aware, but in results section, they say all respondents are knowledgeable and aware. Please clarify the doubts and definitely you need to provide statistical data so that it will be cleared how much population are aware about the CRM activities, and how much are not aware?

The elements of communication, collaboration, and community participation were emphasized and noted during the FGDs and interviews with the key informants. These are paramount in ensuring effective implementation and sustainability of any coastal resource management initiatives. The study revealed that the continuous awareness and information drive on the presence of marine reserve and sanctuary including its purpose and benefits are still necessary to be widely appreciated by the coastal communities. The continuous capability building or provision of technical training for FLET/ bantay dagat and local officials are likewise highlighted as effective strategy in enhancing the fishery law enforcement activities in the municipality.

Coordinative and collaborative multi-level efforts must be sustained in implementing CRM programs and activities like conduct of surveillance operations, law enforcement, mangrove tree planting, delineation of municipal waters, provisions of bantay dagat paraphernalia and equipment, livelihood development among others. It was further revealed that communities were not regularly consulted and involved in making and enforcing policies, programs and plans, which are considered to be an essential ingredient to enhance and succeed in CRM implementation.

4. Conclusion and Recommendations

For any CRM efforts, continuing and multiple education and communication strategies are imperative to build a wide base support from stakeholders. In particular, coastal dwellers of Ragay need to be properly apprised with whatever CRM interventions to be proposed or executed by the local government, BFAR, other government agencies and private entities. If possible, details as to components, purpose/s, benefits, and beneficiaries of CRM-related policies and programs like creation and protection of marine reserve and sanctuary, creation and deputation of FLET, surveillance operations, demarcation of municipal waters must be shared and conveyed to local stakeholders. With the engagement of stakeholders' community members are being empowered community members to identify important issues related to natural resources and increases understanding of how management can help solve socio-ecological problems (Alcala, 1998; Garces et al., 2013). Well-informed communities are expected to understand, appreciate, and ensure public participation making the implementation of these CRM initiatives smooth, effective, and successful.

People and their participation must be considered as key and integral part in all phases and/or process of any CRM initiatives. It is believed that strong community support has been linked to increased management and enforcement of marine sanctuaries, which can help drive positive ecological benefits such as increased coral cover and increase in fish abundance (Pomeroy and Carlos, 1997; Walmsley and White, 2003). It is not enough that they are aware or knowledgeable to any developmental activities but must be enjoined and empowered to engage in implementation of such. Community involvement in policy and decision making may likewise possibly change people's mindset, attitude, and practices towards fishery and aquatic resources management.

Moreover, CRM implementation is a challenging endeavor that requires joint effort of the local government and communities. The importance of community support has been

highlighted in a number of studies in successful marine conservation and natural resource management (Cinner et al., 2016). This co-management, however, necessitates support and participation of different stakeholders from both public and private sectors. A strong collaboration between and among stakeholders would offer a better opportunity to create strong institutional arrangements and availability of resources needed to sustain CRM efforts like bantay dagat operations, maintenance of watch tower and radio communication, conservation and protection of the fish sanctuary, mangrove nursery and planting. As mentioned in study of Mudge (2018), CRM remains a legal responsibility of local and regional governmental agencies, it is widely accepted that management intervention is more successful and sustainable when stakeholder groups are involved in CRM planning and operation.

The local government of Ragay together with MFARMC and FLET/ bantay dagat took the lead in implementation and realizing the objectives of the FishCORAL Project. The local government accepted the leadership and is the prime mover in incorporating good governance in the design and implementation of the CRM initiatives in the locality. This can be shown in the efforts of the LGU to prioritize and institutionalize CRM through provision of annual investments, deputation of FLET and regular support to its operations (i.e. honorarium, fuel expenses), delineation of municipal waters, and mangrove tree planting.

However, the limited knowledge and/or awareness of the coastal communities on the project components, purposes, benefits, and beneficiaries were one of major weaknesses in the FishCORAL project implementation. This means that appreciation, support, and cooperation among coastal communities were likewise limited. Notwithstanding, FishCORAL-related CRM interventions was just recently completed in Ragay respondents were able to perceive its considerable impact to fish stock and reduction of illegal fishing/ prohibited economic activities in the municipal waters, particularly within and nearby the marine reserve and fish sanctuary. In terms of fish catch and income, respondents were not able to identify and assess the impacts of the project due to other intervening and intertwined management factors like lack of strict and serious enforcement of policies, rules, and regulations. Hence, improvements to fish abundances may not been evident if there is encroachment of commercial fishers, lack of compliance with fishing regulations, or if fish populations are naturally slow to recover (Webb et al., 2004). hence,

Based from results of the study, success of CRM interventions in the Municipality of Ragay is dependent on varying interrelated factors such as political, economic, social and ecological. Thus, the respondents and the researcher recommend the following: (a) sustain and expand the initiatives started by the FishCORAL Project by ensuring budget allocation at municipal and barangay levels; (b) continuing conduct of Information, Education and Communication activities at the coastal barangays for better understanding and appreciation by the fisherfolks, officials, and youth of the CRM interventions initiated by LGU and BFAR; (c) LGU must ensure engagement of stakeholders especially coastal communities in policy and decisions making process related to fishery and aquatic resources management; (d) empower communities and fisherfolk organizations through adoption of unified and community-based management of marine reserve and fish sanctuary and fishery law enforcement; (e) strengthen MFARMC, FLET/ bantay dagat, fisherfolks through continuous

capability building and technical assistance on fishery law enforcement and livelihood opportunities development; and (f) ensure a multi-sectoral, multi-stakeholder, and multi-level collaboration and cooperation towards sustainable fishery and aquatic resource management of Ragay municipal waters and Ragay Gulf as a whole.

References

- Alcala, A.C., 1998. Community-based coastal resource management in the Philippines. *Ocean Coast. Manag.* 38, 179–186. [https://doi.org/10.1016/S0964-5691\(97\)00072-0](https://doi.org/10.1016/S0964-5691(97)00072-0).
- Aldon, M.E.T., Fermin, A.C., Agbayani, R.F., 2011. Socio-cultural context of Fishers' participation in coastal resources management in Anini-y, Antique in west central Philippines. *Fish. Res.* 107, 112–121. <https://doi.org/10.1016/j.fishres.2010.10.014>.
- Andalecio, M.N., 2011. Including coastal resource users in fisheries management evaluation of San Miguel Bay, Philippines. *Ocean Coast. Manag.* 54, 760–770. <https://doi.org/10.1016/j.ocecoaman.2011.08.004>.
- Coastal Resource Management Plan Ragay, Camarines Sur 2019-2023
- Community-Based Monitoring System, Ragay, Camarines Sur, 2012
- Garces, L.R., Pido, M.D., Tupper, M.H., Silvestre, G.T., 2013. Evaluating the management effectiveness of three marine protected areas in the Calamianes Islands, Palawan Province, Philippines: process, selected results and their implications for planning and management. *Ocean Coast. Manag.* 81, 49–57. <https://doi.org/10.1016/j.ocecoaman.2012.07.014>.
- IFAD. Fisheries, Coastal Resources and Livelihood Project Supervision Report
- J. Loos, S. Rogers, Understanding stakeholder preferences for flood adaptation alternatives with natural capital implications, *Ecol. Soc.* 21 (3) (2016) art32, <https://doi.org/10.5751/es-08680-210332>
- Maliao, R.J., Pomeroy, R.S., Turingan, R.G., 2009. Performance of community-based coastal resource management (CBCRM) programs in the Philippines: a meta-analysis. *Mar. Pol.* 33, 818–825. <https://doi.org/10.1016/j.marpol.2009.03.003>.
- Municipal Ordinance No. 032, Series of 1999. An Ordinance Regulating Fishing and/or Fisheries Municipality of Ragay, Province of Camarines Sur and for Other Purposes
- Participatory Resource and Socioeconomic Assessment of Ragay Gulf, Philippines: State of

the Coast Report, Ragay, Camarines Sur, 2019

Philippine Statistics Authority (PSA), 2015

Pomeroy, R.S., Carlos, M.B., 1997. Community-based coastal resource management in the Philippines: a review and evaluation of programs and projects, 1984–1994. *Mar. Pol.* 21, 445–464. [https://doi.org/10.1016/S0308-597X\(97\)00016-X](https://doi.org/10.1016/S0308-597X(97)00016-X)

Ragay Coastal Resource Management Plan (CRM) 2018-2022. Ragay Municipal Agriculture Office

Ragay Municipal Fisheries Profile. Ragay Municipal Agriculture Office

Walmsley, S.F., White, A.T., 2003. Influence of social, management and enforcement factors on the long-term ecological effects of marine sanctuaries. *Environ. Conserv.* 30, 388–407. <https://doi.org/10.1017/S0376892903000407>

Webb, E.L., Maliao, R.J., Siar, S.V., 2004. Using local user perceptions to evaluate outcomes of protected area management in the Sagay Marine Reserve, Philippines. *Environ. Conserv.* 31, 138–148. <https://doi.org/10.1017/S0376892904001377>.

Weeks, R., Russ, G.R., Alcala, A.C., White, A.T., 2010. Effectiveness of marine protected areas in the Philippines for biodiversity conservation. *Conserv. Biol.* 24, 531–540. <https://doi.org/10.1111/j.1523-1739.2009.01340.x>.