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Assessment and Perceived Impact of Coastal Resource Management (CRM) Programs in the Southern Part of Masbate Island, Philippines

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Abstract

Coastal Resource Management (CRM) are activities that achieve sustainable use and management of valuable resources in coastal areas. This study presents the perceived impact of the coastal resource management (CRM) interventions implemented by the Bureau of Fisheries and Aquatic Resources (BFAR) under the FishCORAL Project in the Municipality of Milagros, Masbate. The respondents are members of fisherfolk organizations, Bantay Dagat (BD), and community members. The CRM projects include mangrove planting, the establishment of marine protected area (MPA) markers, the construction of a watchtower, and the establishment of Bantay Dagat (BD). Respondents were convinced that the interventions affected their daily living, especially mangrove planting projects. Members of fisherfolk organizations carried out the project in Barangays Jamorawon, Magsalangi, and Tagbon. In terms of knowledge, attitude, and practices (KAP), these could be attributed to the respondent's appreciation of the intervention, which contributed to the protection of the area from flood, storm surge, and tsunami, support for livelihood, the presence of marine animals (i.e., shrimp and crabs), and apprehension of illegal fishing activities. Destructive fishing, domestic waste, and natural calamities are some identified causes of aquatic ecosystem destruction. In terms of socioeconomic, respondents are provided additional income ranging from Php 1,500.00 - 2,000.00 per month, and fish stocks have also increased. The distribution of fishnets and Banca, livelihood, protection of marine resources, and commitment of legal authorities to enforce related fishery policies are among the CRM activities with a sound impact on the community.

Keywords

Non-Livelihood CRM, Bureau of Fisheries and Aquatic Resources, LGU

Milagros, Impact Assessment

1. Introduction

Coastal Resource Management (CRM) are activities that achieve sustainable use and management of valuable resources in coastal areas. The coastal areas are the most affected by changes under the threat of negative effects of habitat and watershed degradation, overfishing, and pollution. These effects were further worsened by the lack of access to basic services, institutional support, and alternative income-generating activities (Preña et al., 2019). Other disturbances which contributed to the declining ecosystem include disease outbreaks, increasing ocean temperatures, overharvesting, pollution, overpopulation growth in the fishing villages (Sunderlin, 1994), and land conversion—which greatly influence soil carbon, surface terrestrial biogeochemical cycle, recreation, and aesthetic value (Mudge, 2018). These were worsened by the lack of information drive, strict enforcement of policies, and empowerment of fishermen organizations. These disturbances are critical to decision-making especially at the level of government to set improvement targets, adopt new practices and implement policies to lessen natural and man-made disturbances in the environment (Nguyen & Liou, 2019). However, implementation of restoration projects on a large spatial scale, improvement of the current project management system, diversifying the source of restoration funds, and strengthening technological research are some of the suggested activities to ensure sustainable use of marine space and extraction of its resources (Eales et al., 2021).

In the Philippines, coastal resource management (CRM) programs are widely implemented to address decline in natural resources and promote food security. The management came from national agencies with regulatory control and development of fisheries. As it evolved the involvement and participation of community-based organizations including the organization of fisherfolks in management activities. However, the involvement of these community-based organizations does not guarantee the successful protection of coastal ecosystems. There shall be a monitoring and evaluation mechanism in determining the effectiveness of CRM programs (Mudge, 2018).

The government in its effort to alleviate poverty and enhance food security implemented the Fisheries, Coastal Resources, and Livelihood (FishCORAL) Project. The FishCORAL Project aims to reduce the poverty incidence in the target coastal communities with the objectives of adopting sustainable management of the fishery and coastal resources and increasing the income of fishing households through sustainable engagement in diversified livelihood activities. In 2019, the Participatory Resource Socio-Economic Assessment (PRSA) was implemented to provide baseline information on the conditions of the coastal and fishery resources (Dioneda et al., 2019a; Preña et al., 2019).

The LGU of Milagros was already a member and a recipient of the internationally funded project after BFAR introduced the concept of coastal resource management. In 1994, the Masbate Fishery Development Program started a project which aimed to improve the living condition of coastal communities especially fishers by employing sustainable technology and community-based fisheries conservation measures (CRMP, 2000). In 2013, there are 1262 registered fisherfolks from all of these Barangays organized into Fishery and Aquatic Resource Management Councils (FARMCs) and other fishing cooperatives or organizations. There are 856 motorized and 337 non-motorized fishing boats (Milagros, 2021). The Municipality has 53.350 hectares (or 94.36%) of alienable & disposable land and 1.13 hectares of swamps, marshes, and mangroves. The forest lands covered 3.190 hectares (Assessment Results and Consolidated Data Analysis, 2016).

The Municipality of Milagros was involved in the CRM Project of the Visayan Sea Project of CRM project and established the fish sanctuary in Barangay Bangad in 2000. With the encouragement from LGU officials allocating a CRM budget from the 20% economic development fund (EDF), the program expanded in 2000 which includes the other aspects of CRM and environment management (Yambao et al., 2001).

Recognizing the importance of a project-based impact, this study aimed to evaluate the perceived impact of CRM programs at different levels. Specifically, this study was designed to: 1) determine the awareness by the fisherfolk of the CRM initiatives of FishCORAL in Milagros; 2) document the knowledge, attitudes, and practices of the fisherfolk attributed to these interventions; 3) identify the perceived socio-economic and ecological impacts of the CRM initiatives; and 4) document lessons to improve the implementation of fishery policies, programs, and plans for effective CRM in the municipality. The results of this study shall provide insights into the factors that contributed to the success of intervention made and how communities are involved in the decision-making process and selected as beneficiaries.

2. Materials and Methods

2.1. Study Site

The Municipality of Milagros has a land area of 565.30 sq·km. or 13.62% of the Province's total area and is the largest municipality in the province of Masbate. **Figure 1** shows the coastal habitat of Milagros. It is rich in natural and mineral resources like manganese, white clay, gold, copper, and silver. It is bounded by Municipalities of Aroroy, Baleno, and Masbate City in the North, Asid Gulf in the South, in the East by the Municipalities of Cawayan, and in the West by Municipality of Mandaon (Assessment Results and Consolidated Data Analysis, 2016).

2.2. Respondents

The study covered eight (8) Barangays with identified CRM programs implemented. The selection of respondents was based on the degree of involvement

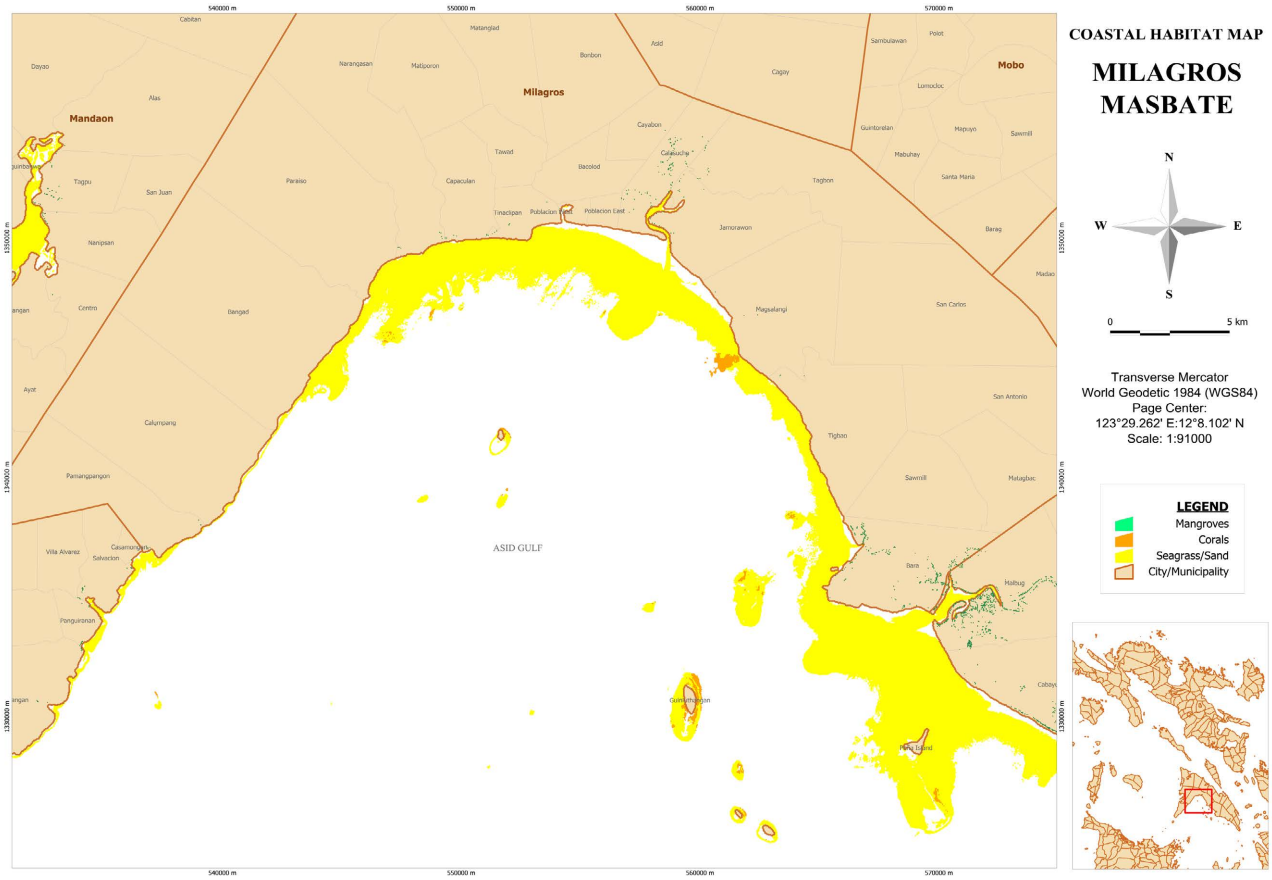

Figure 1. Map showing the Coastal Habitat of Milagros, Masbate.

and participation in the program who are members of fishermen organizations, Bantay Dagat group/task force, and members of implementing and monitoring team. A focus group discussion (FGD) was conducted in Barangay Bangad and Tagbon and participated with members of Bantay Dagat, fishermen, and beneficiaries of the mangrove plantation project.

2.3. Methods of Data Collection and Analysis

Prior coordination was made to facilitate data collection with the Municipal and Barangay officials before interviews and Focus Group Discussions (FGDs). Due to IATF restrictions to conduct field interviews in the area, the team devised ways by employing online meetings and SMS to facilitate data gathering. To achieve the goal of the study, a questionnaire was utilized, which was divided into six parts: 1) demographic profile, 2) membership to the organization, 3) training attended, 4) impact of the program in terms (of awareness, functionality, effectiveness, and benefits), 5) socio-economic and ecological impact, and 6) program improvement.

The instrument has undergone a series of revisions following a validation process conducted in Sto. Domingo (Albay), Manito (Albay), Prieto Diaz (Sorsogon), and Pasacao (Camarines Sur). This is to define the areas where proper

information will be collected to achieve the desired results of the study.

With the assistance of the BFAR community facilitator, MAO personnel, LGU, and Barangay officials the researchers managed to gather the list of fishermen organizations organized per Barangay and identified the respondents or beneficiaries of the program. Along with parallel interviews, FGDs in some Barangays with similar projects and residents were initiated and facilitated. The FGDs is the best tool used to understand opinion, motivations, attitudes, and thought and investigate better to understand the program environment (Winke, 2017; Krueger & Casey, 2015).

After each interview, the research assistants checked and cleaned the questionnaires for consistency and readability. In cases of unclear responses, respondents are contacted through SMS which was previously requested during the interview. The responses were summarized using frequency and percentage distribution presented in tables and figures.

3. Results and Discussions

3.1. Status of the CRM Projects

Some CRM projects implemented in Milagros are somewhat completed, not yet complete, or unused. Of the several projects, only the mangrove planting was completed as of this writing. However, some projects are implemented but not yet completed, and are unavailable (Table 1). Results of the interviews, FGDs, and review of available documents revealed the following concerns and status of each project.

Radio Communication. Radio communication was not available and respondents are unaware of this project.

Table 1. Status of CRM-related projects in Milagros.

Project	Status	Reason/Issue
Radio Communication	Not Available	Conflicting information
Establishment of Bantay Dagat	Part completed	Conflict in member's accreditation
Uniform	Completed	-
Training	Completed	-
Patrol Boat	Damaged but the engine is available	Destroyed by the typhoon and lack of support
Accessories (GPS device, digital camera, night vision binoculars)	Not Available	-
Watch Tower	Construction Completed, No paint and signages, and used	No proper transfer of custody
MPA Markers	Completed	Destroyed by typhoon
Others (Mangrove Planting)	Completed	-

Establishment of Bantay Dagat. By virtue of Ordinance Number 1-2005, the LGU reactivated the Municipal Bantay Dagat task force under the control of the Office of the Municipal Agriculturist. Though there was policy but a conflict in deputization and accreditation of members was identified. Most of the members are residents of Barangay Calasuche and Tigbao which is approximately 19.7 and 23.9 km away from the watch tower. In 2008, the LGU trained 20 members of law enforcement who are mostly residents of Barangay Bangad. The BFAR Regional Office V organized the Bantay Dagat Silangan Kaladuan Base stationed at Barangay Bara. The office provided uniforms and training reorientation on law enforcement which was attended by 10 BD members. The schedule of duties was observed daily, 3× a week, and shifting. However, there were always unclarities in the organization and recognition of *BD*. During the interview and focus group discussions, the issue was discussed. As observed, there was a slight miscommunication among the involved participants. The other parties presented proof of deputization order and another holding as a member of the Fishery Law Enforcement Team (FLET) with training in law enforcement. Recently, the local government in collaboration with BFAR-PFO Masbate conducted the fishery law enforcement training (FLET) for selected fisherfolk and personnel from the PNP to be appointed as Bantay Dagat. This program was part of recognizing the crucial role of municipal fisherfolk in the protection and management of coastal and aquatic resources (BFAR Masbate PFO, 2021).

Patrol Boat. To effectively carry out the mandated duties and functions, BFAR provided one (1) Patrol Boat with engine and accessories like life vests and uniforms. This was used for coastal defense, border protection, search and rescue, and apprehending illegal fishing activities. The boat has an engine and accessories, including a life vest and uniforms. The boat was already damaged, and the engine was transferred to another banca to be functional and operational for community needs. This signals that government projects have weaknesses, especially in evaluation and monitoring.

Watch Tower. The construction of the watch tower in Barangay Bangad was completed in December 2020 (as shown in **Figure 2**). The tower has an overlooking view of the MPA and mangrove area. Respondents have hesitation whether the said structure was already turned over to LGU. Up to this writing, the structure was still unpainted but already used. The Barangay Kagawad, a resident of Barangay Bangad acted as tower keepers who were asked to take the post and monitor the activities in the area.

MPA Markers. To provide protection and security for the area the BFAR established a marker. The MPA markers are trapezoid and circled shape with orange color. The number of markers was approximately 6 to 30 units and was made of fiber. These markers are said to be in good shape and positioned strategically before a typhoon struck the area. And, based on the recollection of the respondents, the markers are funded by the BFAR-FishCORAL project and installed by Barangay officials, BFAR, LGU, and Bantay Dagat. Respondents are

(a)

(b)

Figure 2. CRM projects implemented in Milagros: (a) watch tower in Brgy. Bangad and (b) Mangrove Planting.

confused about whether these markers were turned over to LGU sometime in 2019 or 2020.

Mangrove Planting. The mangrove area in Asid gulf was estimated to be around 686 hectares. The Municipality of Milagros has approximately 41.16 hectares or contributed 6% of the overall (Guiriba et al., 2019). Mangrove tree planting was the direct and visible project implemented in eight (8) Barangays. These are the Barangays of Bangad, Jamorawon, Tagbon, Magsalangi, Calasuche, Bara, Poblacion, and Tigbao. The project was carried out by fisherfolk organizations where members are mostly female, especially in Barangays Jamorawon, Magsalangi, and Tagbon. The respondents have different mangrove area coverage with certain days' duration. For example, a group with 11 members should plant around 3,300 propagules covering 6 hectares (Tagbon) of the mangrove area. For each propagule planted members will be paid Php 5.00 pesos and Php 2.00 for replanting. Some need to plant 6,000 propagules in an area of 2 hectares

(Sitio Pasig, Calasuche), receiving Php 2497 pesos for 10 days per person. This strategy is less expensive than hiring a contractor whose planting costs more than US $400/ha. Community-based mangrove planting has better cared for when local communities are part of it, endowing their sense of ownership (Salm et al., 2000).

Rhizopora sp and *Avicennia sp*. are widely grown mangrove species in Milagros. With the mangrove planting project, respondents identified the species planted as *Rhizophora*. This is the preferred species because this is a fast-growing specie with a 67% survival rate but a lower growth rate. Compared to *Avicennia*, with a significantly higher growth rate but lower survival rates depending on the location (Bijsterveldt et al., 2022). The activity was supervised by a Community Facilitator (CF) hired by BFAR—a resident of Milagros. Regarding mangrove species, respondents are not aware of what kind of species they are only oriented on how to plant the propagules in their designated areas.

3.2. Awareness of the CRM Projects

In the interviews, some respondents are already aware of the FishCORAL program which was closely associated with the Bureau of Fisheries and Aquatic Resources (BFAR). There was hesitation on the classification of whether BFAR, the Province, and the Municipal government implemented the project. In 2019, the Tagbon Pangisdaan Women Association (TPWA) requested the livestock "Baboyan" project. However, due to problems in the area, the project downloaded was mangrove planting. The project recorded high awareness compared to other projects (**Figure 3**). This project was a direct and visible intervention that impact the lives of the respondents, especially in the target Barangay beneficiaries. The project was carried out by fisherfolk organizations where members are mostly female, especially in Barangays Jamorawon, Magsalangi, and Tagbon. Before the implementation of CRM projects, there were consultations made before its implementation with members of Bantay Dagat, Barangay residents, the Municipal Agriculturist Officer, the Philippine National Police, and local officials during

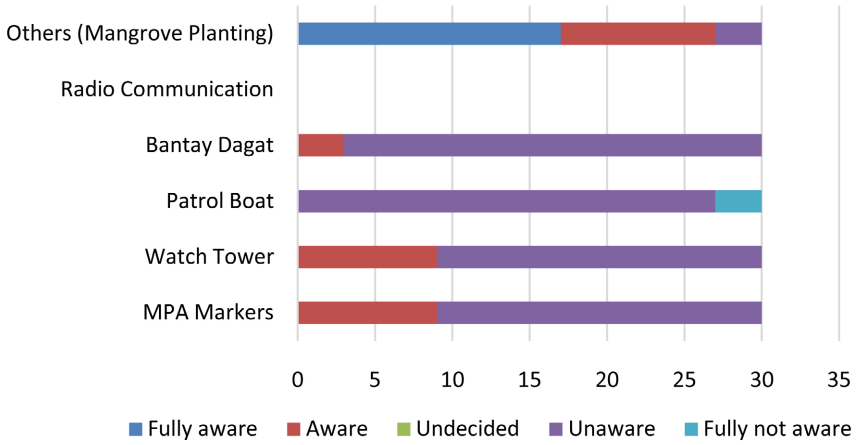

Figure 3. Respondent's awareness of the intervention FishCORAL in Milagros, Masbate.

the Barangay assembly and meetings with respective organizations. These responses are validated during the FGDs and revealed that participants are only aware of the programs implemented in their respective areas. However, those who are members of the Bantay Dagat, enforcement team, and with access to different areas have manifested awareness in multiple programs.

Other CRM projects of which respondents are aware include watch towers, MPA markers, and BD. These projects have addressed the problems and needs of the community, especially in protecting coastal marine and fisheries resources and controlling potential illegal activities. The construction of watch tower was strategically constructed in Barangay Bangad because of the location of MPA. The establishment of MPA is one of the most popular CRM strategies intended to protect vulnerable species and became the habitat of a number of marine species that migrated twice a year to feeding and breading areas (Hoyt, 2009). Milagros has 3 MPAs located in Barangay Bangad, Pacao, and Boray with a total area of 134.30 hectares (Dioneda et al., 2019b). The location of the MPA is within sight of the watch tower where anyone on duty could respond immediately. In the interviews conducted, the majority of the respondents are aware of the MPA and watch tower located in Barangay Bangad. Similarly, the establishment of MPA markers is well in-placed before the typhoon struck the area. Under the FishCORAL project, the BD was established but for no reason, the LGU did not acknowledge their presence. As of this writing, two groups of Bantay Dagat were organized—LGU and BFAR. In 2019, the LGU reactivated the Municipal Bantay Dagat task force by virtue of Ordinance number 1-2005 under the control of the Office of the Municipal Agriculturist (Executive Order No. 1, 2019).

The awareness of any project influences the attitudes and behaviors of the people in the attainment of the project's goals (Sayers, 2006). Therefore, with the goal and purpose of the FishCORAL project, it is important to increase people's awareness and emphasize its importance. The support of the communities and local government units will serve as an ingredient for ensuring that projects will be sustained.

3.3. Attitudes and Practices

The knowledge, attitude, and practices (KAP) of the projects were observed in different views depending on the awareness of the project. However, based on the interviews and FGDs conducted many fisherfolks and members of the community are still complaining about the presence of large-scale fishing activities in the area and the presence of a mangrove lease agreement. They are recommending strict implementation of the fisheries ordinance in the area. Unfortunately, members of BD admitted that there are factors that control the implementation of the ordinance. They are aggressive in implementing the ordinance but it was difficult to conduct sea operations because some fishing vessels are hard-headed with fishing boundaries. Some were apprehended and the fish catch was turned over to DSWD and distributed to inmates of the area.

The implementation of CRM programs has visibly brought benefits to the communities. Respondents have benefited from protecting their community from flood, and storm surge. Some have noted that there was an improvement in fishing and enhanced the presence of marine animals (shrimp and crabs), especially in the mangrove planting project. However, several participants are silent or recorded none. This implies that some participants are silent about what possible impact the CRM programs may bring to them and the community in general. It could be possible that these participants just aimed to be part of the organization to enjoy benefits and privileges rather than accepting that these CRM programs especially mangrove planting may deliver economic stability and a source of livelihood. The increased presence of crustacean resources in the mangrove rehabilitation area signals an opportunity. Thus, the Government especially the LGUs and BFAR in its effort have managed to deliver suitable CRM programs and address the emerging concerns of poverty incidence in poor coastal communities in the area.

Periodic management activities in mangrove plantation areas control potential illegal activities and protect young mangroves. In one instance, participants reported the presence of potentially poisonous chemicals affecting the mangrove area. Local residents were alerted and with word of mouth, the information was disseminated and reached the authorities. The good part about the community-based organization is that they have their own support and control mechanism. They support each other by looking into others' designated planting areas. Also, the responsibilities were extended to the general advantage of the community especially the protection and preservation of mangrove sites.

Respondents are aware that there are practices that affect the rehabilitation and reforestation programs. These practices include using mangrove areas as a zone of human habitation expansion, extraction for fuel wood, fishpond conversion, unwise waste disposal, varied livelihood and economic activities, and irresponsible boat passage and docking. Participants know that some mangrove areas are rented by the private individuals, especially in Barangay Jamorawon. In 2018, a portion of approximately 96 hectares was leased to private entities and corporations.

Over the years, the awareness regarding the ecological and economic importance of mangrove has grown. As a result, increasing efforts were made by authorities, environmental organizations, non-governmental organizations, and institutions to restore marine resources from destruction and degradation. These activities are directed toward fisheries habitat restoration, shoreline protection, and sustainable development (Erftemeijer & Lewis, 1999). Mangrove seedlings or saplings have higher chances of surviving if planted on the right substrate. Mangrove species have unique adaptations to stressful conditions. The mangrove roots are generally adaptive to either extremely low or high salinity (Srikanth et al., 2016). But prolonged exposure to either such extreme may decimate a mangrove forest or a portion of it. This was the case of the massive mangrove dieback in a natural park in Batuan Masbate, which affected around 1.72 hec-

tares of healthy mangrove (Dioneda et al., 2019a). In the Caribbean coast of Colombia, 60% of the originally 51,000 hectares of mangrove forest have died due to hyper salinization, increased sedimentation rates, and lower water levels (Elster, 2000). As a remedy, the obstructed channels were reopened to give way for more water exchange in the area.

In 2017, the Barangay Local Government Unit (BLGU) and Tabang sa mga Biktima sa Masbate (TABI Masbate) sponsored a mangrove planting participated by Pantawid Pamilyang Pilipino Program beneficiaries and other organizations (Ang Aking Kwento Bilang Isang Benepisyaryo, 2017). The implementation of CRM programs in 2018 delivered a significant message to coastal communities especially for mangrove planting wherein beneficiaries noted an abundance of fish and crustacean resources, increase their fish catch, and opened-up additional sources of income. Coastal protection from typhoon surges and destructive waves was also the positive perception of communities about the mangrove planting project.

Women's involvement has a strong role in the implementation of mangrove planting. Near to half (47%) of those involved in the project are female and 21% of them are officers. These organizations are Tagbon Pangisdaan Women Association, Samahang Mangingisda ng Calasuche, and Jamorawon Crab Pen Association. Some are members of these organizations and are generally active in CRM programs and activities.

3.4. Perceived Socio-Economic and Ecological Impacts

The majority of the respondents are in the late middle age group. Most are male and married. In terms of income, respondents were in the minimum income rate threshold which is below the minimum rate set by Tripartite Regional Wage Boards which is set to Php 310.00 a day varying from region to region (National Wages and Productivity Commission, 2021). According to Philippine Statistics Authority (PSA) (2023), the current poverty threshold is Php 10,481.00 which is the minimum amount (Proportion of Poor Filipinos, 2019) a family of five needs to feed in a month. In 2019, there are projects and activities implemented by the Government along protection, conservation, and rehabilitation of resources in the coastal barangays. These programs provided a positive impact and helped participant beneficiaries to have alternative sources of income (Preña et al., 2019).

Also, it was revealed that the majority (80%) of respondents perceived the project to have effects on their daily living and the community as well. When asked what are those advantages, participants were given the chance to be provided an additional income to support their family, the opportunity for livelihood, protection from calamities, and increased fish catch. Mangrove planting was one of the reasons why there was an increase in their income. The amount received (approximately Php 1,500.00), although small but helped provide additional income. Some managed to increase their fish catch from Php 1,500.00 to Php 2,000.00 monthly. One of the participants managed to compare the past and

present income from fishing ranging from Php 300 - 400 (before) to Php 700 – 1,000 (after). Respondents acknowledged and appreciated the government's effort but requested to consider reviewing the mangrove space lease agreement with corporations and private entities, especially in Barangay Jamorawon. On the fish catch, 57% affirmed that, on average, about 3 kilos to 25 kilos increased their fish catch (as shown in Figure 4). This implies that the project's goals impacted the attainment of fish production and the protection of coastal resources. The implementation of CRM projects has provided positive ecological impacts due to the mangrove rehabilitation activities and decreasing the number of illegal fishing activities which resulted in improved fish catch.

On ecological impacts, the implementation of CRM projects has resulted from positive impacts due to the mangrove rehabilitation (planting), creation of BD, the establishment of MPA markers, and construction of watch towers all of these have contributed to decreasing the number of illegal fishing activities in the area and improved fish catch. Although there was confusion about using a patrol boat it added to the law enforcement operations and protection of the fish sanctuary.

3.5. Lessons to Improve the Implementation of Fishery Policies, Programs, and Plans for Effective CRM Programs

According to Eger & Courtenay (2021) the most challenging life experiences of ICM initiatives with government and indigenous authorities, civil society, and non-governmental organizations is to understand the scope of governance challenges better. The largest challenge for ICM initiatives, as identified, was the inconsistent and unsustainable buy-in from leaders and unsustained commitment from legal authorities over time, including provincial and local governments. These challenges impact all elements of Governance and all phases of operationalization. This presents the lessons from implementing fishery policies, programs, and plans for future CRM programs for consideration.

One of the study's goals is to determine the perceived needs of the participants. In Table 2, participants were asked what suggestion they perceived would

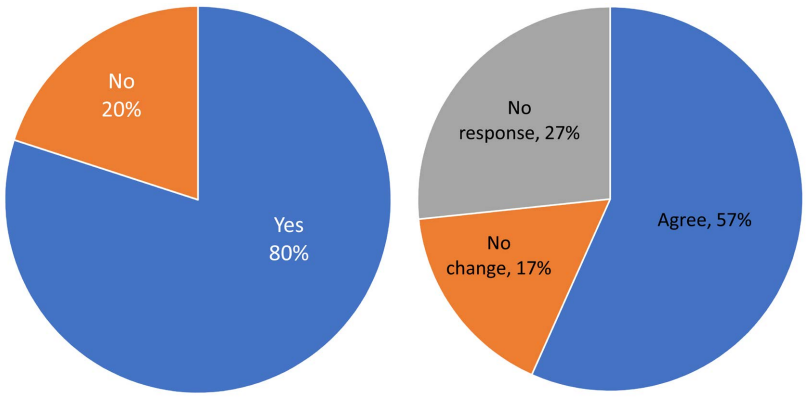

Figure 4. Perceived effects of CRM projects to (a) household and (b) increase fish catch.

improve the CRM programs. It reveals that 67% of the participants suggested improving the proper management and implementation of the program. There are 20% who suggested providing livelihood in terms of fishnets and Banca. The remaining 10% and 3% are anchored on protecting marine resources and additional CRM programs.

Additionally, some of the improvements raised include the completion and finishing of the watch tower, presence, and recognition of BD, connection of surface marker buoys, and provide color coding for each bouy. The mangrove planting was considered the most significant CRM program experienced by the participants, with 67%. The BD has 13%, and Aquasilvi Culture and installation of MPA buoy with 7% and 3%, respectively (Table 3).

This implies that participants captured the presence of the CRM programs but need sound management and implementation. For example, the LGU has enacted an ordinance delineating the boundaries of the Municipal waters of the Municipality of Milagros, Province of Masbate. The coastline is approximately 54 km or about 6% of the province's total coastline (ICRMP, 2013). However, these areas are not protected because MPA markers are not well established in designated locations, and there was a lack of bantay dagat. The MPA markers are washed out by typhoons leaving authorities to have difficulty identifying the exact delineation markers. The Bantay Dagat conducted patrols and apprehended violators in the MPA. They have proper training on FLET before and in implementing the CRM programs. Still, there is a need to institutionalize and standardize the management and organizational structure to support the program. These observations are not new in CRM programs, especially mangrove reforestation and conservation, in the studies of (Camacho et al., 2020) suggested harmonizing mangrove policies and promoting effective sustainable management and rehabilitation. It was identified that there was poor survival in plantations because of the wrong choice of species and limited training activities on

Table 2. Participant suggestions on how to improve the CRM program.

Rank	Suggestion
1	proper management of CRM
2	livelihood
3	protection of marine resources
4	additional CRM programs

Table 3. Significant events encountered by participants in the implementation of CRM programs.

Rank	Significant Event
1	Mangrove Planting
2	Bantay Dagat
3	Aquasilvi Culture
4	Installation of MPA Buoy

cutting and planting propagules. And the decline of mangroves was caused by overexploitation by coastal dwellers and conversion to settlements, agriculture, salt pans, and industry. Thus, mangroves should be conserved and recommended to establish protected, productive, reforestation, and conversion areas (Primavera, 2004).

4. Conclusion

Mangrove Planting is considered the most beneficial CRM project. It provided livelihood and served as protection from floods, storm surges, and tsunamis. The improved presence of marine animals such as shrimp and crabs increased the respondents' income from Php 1,500.00 to Php 2,000.00 monthly, and about 3 kilos to 25 kilos increased fish caught. Others considered the project an opportunity to protect the planting area from illegal fishing activities. Some areas of concern need to fill the deficiencies to fulfill the goals and objectives of the FishCORAL project. These are institutionalization of marine rangers, accountability of personnel, completion of unfinished projects (i.e., watchtower, MPA markers), provision for a new patrol boat, and sustainability of the activities.

Implementing CRM projects has contributed to decreasing illegal fishing activities and improving fish catch. These were associated with mangrove rehabilitation (planting), the creation and deputization of the Bantay Dagat, the establishment of MPA markers, and the construction of watch towers.

The strict implementation of laws and ordinances and the support of the local government with proper management of the projects, sustainable livelihood, enhancing the protection of marine resources, and providing additional CRM programs are the lessons that need to be improved in the implementation of fishery policies, programs, and plans for effective coastal resource management programs.

As a recommendation, there must be support among residents and managers by instituting physical infrastructures, organizing and training local marine rangers, strictly enforcement of local ordinances and national laws, community-based activities, agency-to-agency partnership (i.e., DENR, BFAR, DOLE, DSWD) tapping project beneficiaries like 4Ps, TUPAD to be involved in CRM projects and provide a sense of ownership, especially in mangrove management.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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