



CHALLENGES IN FISHERIES CONSERVATION AND LIVELIHOOD SUSTAINABILITY IN MALITA, DAVAO OCCIDENTAL, PHILIPPINES

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ABSTRACT. The Ecosystem Approach to Fisheries Management (EAFM) integrates ecological, social, and economic considerations to ensure sustainable fisheries. This study assessed ecosystem services and fisheries management in Malita, Davao Occidental, to support the development of an ecosystem-based fisheries management program. Specifically, it examined the socio-demographic profile of stakeholders, their roles in coastal resource protection, sustainable fishery utilization practices, livelihood opportunities, and law enforcement compliance. The study employed a descriptive research design, utilizing a structured survey questionnaire and purposive sampling across five coastal barangays. Findings revealed that the majority of respondents (61.48%) were young adults aged 21-30 years old, predominantly male (67%), college-educated (61.48%), and Bisaya/Cebuano speakers. Mangrove ecosystems were the most prevalent coastal habitat, with SPAMAST and BFAR leading conservation efforts. However, weak enforcement of fisheries laws, inadequate community awareness, and limited livelihood

opportunities hindered sustainable fisheries management. While Tilanggit production emerged as a successful livelihood initiative, other projects, such as seaweed farming, remained largely unimplemented due to unsuitable environmental conditions. Compliance with key fishery laws was relatively high, with 67% of respondents affirming adherence, and 100% acknowledging the enforcement of RA 8550 (Philippine Fisheries Code of 1998) and RA 7160 (Local Government Code). Despite these efforts, gaps in enforcement, community engagement, and sustainable livelihood opportunities persist. Strengthening law enforcement, enhancing community participation, and expanding sustainable livelihood programs are essential to improving fisheries management in Malita.

Keywords: *coastal resource management, Ecosystem Approach to Fisheries Management, fisheries law enforcement, sustainable livelihoods*

INTRODUCTION

In 2003, the Committee on Fisheries (COFI) adopted the Ecosystem Approach to Fisheries (EAF) to aid in implementing the Code of Conduct for Responsible Fisheries, the United Nations Convention on the Law of the Sea (UNCLOS), and the Convention on Biological Diversity (Fletcher & Bianchi, 2014). The Ecosystem Approach to Fisheries Management (EAFM) provides a comprehensive framework that considers the environmental effects of fishing while also addressing social and economic factors to ensure both human and ecosystem sustainability (Fletcher, 2008; Garcia & Cochrane, 2005). The Philippines has implemented multiple foreign-funded projects on fisheries and coastal resource management (CRM) that integrate EAFM principles into their planning and execution. However, marine habitats worldwide continue to deteriorate (Halpern et al., 2008), and many marine species, particularly those that are overexploited or highly vulnerable, have been significantly reduced in their natural habitats (Pauly et al., 1998).

Fisheries in the Philippines are vital to the country's economy, culture, and environment, yet they are facing a crisis characterized by declining fish populations, smaller fish sizes, and shifts in species composition. In Malita, Davao Occidental, threats such as illegal fishing, mangrove deforestation for tourism development, sand mining, white pebble collection, weak enforcement of CRM laws, and improper waste disposal highlight the urgency of this study. The worsening state of fisheries both in the Philippines and globally is driven by overfishing, illegal fishing, and habitat destruction, further aggravated by increasing demand and population growth. To protect marine resources and sustain economic benefits, national and local stakeholders must prioritize fisheries and coastal resource management. In terms of municipal fisheries production, Davao del Sur, Davao del Norte, and Compostela Valley accounted for 5.3%, 3.0%, and 2.8% of the total, respectively, while Davao City contributed only 1.2% (Philippine Statistics Authority, 2019).

The Philippines lacks a comprehensive law that fully embodies the principles of the Ecosystem Approach to Fisheries Management (EAFM) (Pomeroy et al., 2013). However, there is increasing recognition of this approach in existing policies and programs. Despite these efforts, ocean habitats continue to degrade globally (Halpern et al., 2008), and certain marine species, particularly those highly valued or vulnerable, have been significantly depleted (Pauly et al., 1998). In response, the municipal government of Malita enacted Local Ordinance No. 016, Series of 2008, in alignment with the Philippine Fisheries Code of 1998, to promote conservation and sustainable coastal resource management. This ordinance aims to ensure ecological balance, environmental protection, and long-term resource sustainability for local communities.

This study comprehensively assessed ecosystem services in the context of fisheries management to support the development of an ecosystem-based fisheries management program. Specifically, it aimed to: (1) analyze the socio-demographic profile of respondents, (2) assess key stakeholders' roles in coastal resource protection and rehabilitation, (3) evaluate sustainable fishery resource utilization practices, (4) identify sustainable fishery livelihoods, and (5) examine compliance and enforcement of fishery laws. A modified structured survey questionnaire (Pomeroy et al., 2013) was utilized, employing purposive sampling and a one-shot survey approach throughout the study.

METHODOLOGY

Study Site

The study was conducted in the municipality of Malita, Davao Occidental, a province situated along the Davao Gulf, known for its abundant fisheries and diverse marine resources. Comprising five coastal municipalities, the province heavily relies on fishing as a primary source of livelihood. This research focused on five coastal barangays: Fishing Village, Mana, Lais, Buhangin, and New Argao. The study's respondents included representatives from various agencies and organizations such as LGU-Malita, DENR, MENRO, OMAF, BFAR, SPAMAST, NGOs, and other key stakeholders involved in fisheries management and resource rehabilitation efforts. Data collection was conducted through individual interviews, using a modified-structured survey questionnaire, with each interview lasting approximately 3-5 minutes. The study employed a descriptive research design, utilizing percentage, frequency, and mean as statistical tools for comparison and evaluation.



Fig. 2 Map showing the location of the study site

Research Design and Instrument

The study was conducted using a modified-structured survey questionnaire based on (Pomeroy *et al.*, 2013). Data Gathered include the socio-demographic profile of the respondents, resource protection and rehabilitation initiatives, identification of sustainable fishery resource practices, determination on the sustainable fishery livelihood, and the determination on the compliance and enforcement of fishery laws by the key implementers.

This study was done following the purposive sampling technique and a one shot sampling was employed all throughout the study duration. The question to the respondents

was presented in English version and was translated in Cebuano to facilitate easy understanding.

Data Gathering Procedure

Prior to the actual conduct of the study, a letter of intent stating objectives of the study was made and sent to the concerned offices and organizations for approval. Respondent's prerogative and convenient time and place was considered.

Respondents

The respondents of the study were coming from the following agencies and organizations all key players directly engaging in fisheries management and resource rehabilitation activities. They were interviewed based on the content of the modified-structured survey questionnaire. Individual interview was administered for a period of 3-5 minutes per respondents only.

Table 1. Total number of people's organization and personnel per agency.

Agencies	No. of Personnel
1. Bureau of Fisheries and Aquatic Resources (BFAR)- Davao Occidental (BFAR-Davao Occidental, 2021)	9
2. LGU/Municipal Environment and Natural Resources Office (MENRO) (MENRO-Malita, 2022)	44
3. LGU / Office Of the Municipal Agricultural & Fisheries (OMAF) (OMAF, 2022)	50
4. SPAMAST Malita, Davao Occidental (SPAMAST, 2022)	5
5. Lahusan Small Fisherfolks Association (LSFA) (LSFA, 2022)	40
TOTAL	148

Data Analysis

The following scale was used as basis to determine the coastal resource protection and rehabilitation initiatives.

RANGE OF SCALE	DESCRIPTION	QUALITATIVE INTERPRETATION
4.21 - 5.00	Highly visible	This means that the coastal protection and rehabilitation initiatives are highly existing.
3.41 - 4.20	Moderately visible	This means that the coastal protection and rehabilitation initiatives are moderately existing
2.61 - 3.40	Fairly visible	This means that the coastal protection and rehabilitation initiatives are fairly existing.

1.81 - 2.60	Less visible	This means that the coastal protection and rehabilitation initiatives are less existing.
1.00 – 1.80	Not visible	This means that the coastal protection and rehabilitation initiatives are not existing.

The following scale was used as basis to determine the sustainable utilization of fishery resource practices.

RANGE OF SCALE	DESCRIPTION	QUALITATIVE INTERPRETATION
4.21 - 5.00	Extremely high noticeable	This means that utilization of fishery resource practices have been applied based on the response of the respondent's indicator stated is always felt and occurring.
3.41 - 4.20	Highly noticeable	This means that the utilization of fishery resource practices have been applied based on the response of the respondent's indicator stated is often felt and occurring
2.61 - 3.40	Fairly noticeable	This means that the utilization of fishery resource practices have been applied based on the response of the respondent's indicator stated is sometimes felt and occurring.
1.81 - 2.60	Less noticeable	This means that the utilization of fishery resource practices have been applied based on the response of the respondent's indicator stated is rarely felt and occurring.
1.00 – 1.80	Not noticeable	This means that the utilization of fishery resource practices have been applied based on the response of the respondent's indicator stated is rarely felt and occurring.

The following scale was used to determine the various sustainable fishery livelihood implemented in the locality.

RANGE OF SCALE	DESCRIPTION	INTERPRETATION
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4.21 - 5.00	Highly implemented	Implies that the implementation of fishery livelihood is observed and followed based on the response of the respondents indicator stated is always felt and occurring.
3.41 - 4.20	Moderately implemented	Implies that the implementation of fishery livelihood is observed and followed based on the response of the respondents indicator stated is often felt and occurring.
2.61 - 3.40	Fairly implemented	Implies that the implementation of fishery livelihood is observed and followed based on the response of the respondents indicator stated is sometimes felt and occurring.
1.81 - 2.60	Less implemented	Implies that the implementation of fishery livelihood is observed and followed based on the response of the respondents indicator stated is sometimes felt and occurring.
1.00 – 1.80	Not implemented	Implies that the implementation of fishery livelihood is observed and followed based on the response of the respondents indicator stated is never felt

RESULTS AND DISCUSSION

Socio-Demographic Profile

The respondents' socio-demographic profile was recorded in terms of sex, age, civil status, educational attainment, religion, tribes, and total number of children by three (3) agencies: SPAMAST academe and people's organizations from five (5) selected Barangays: Fishing Village, Mana, Lais, Buhangin, and New Argao.

It revealed that 80 (65.57 percent) of the 122 respondents were men. In terms of productive age, (21-30 years old) has the highest proportion (64.46 percent), while civil status has the highest percentage (70.38 percent). The respondents' educational attainment ranged from college to graduate level for 75 of them (61.48 percent). When it came to religion, 111 (90.98 percent) of the respondents identified as Catholics, and those with 1-3 children had the highest percentage of children (45.90 percent).

Table 2. Socio-demographic profile of the respondents

Particulars	F (Frequency)	% (Percentage)
Gender		
Male	80	65.57%
Female	42	34.43%
Total	122	100%
Age range (in years)		
0-20	0	0%
21-30	64	52.46%
31-40	37	30.33%
40 above	21	17.21%
Total	122	100%
Civil Status		
Married	70	57.38%
Single	51	41.80%
Others:	1	
Live-in		.82 %
Total	122	100%
Educational Attainment		
Elementary Level/ Graduate	23	18.85 %
High School Level/ Graduate	23	18.85 %
College level/ Graduate	75	61.48%
Others:		
Vocational	1	0.82%28
Total	122	100%
Religion		
Catholic	111	90.98%
Islam	10	8.20%
Others:		
Evangelical	1	0.82%
Total	122	100%
Tribe		
Tagakaolo	34	27.87%
Bisaya	78	63.93%
Tagalog	0	0%
Others:		

Kalagan	10	8.20 %
Tausog		
Ilonggo		
Total	122	100%
Total Number Of Children		
1-3	56	45.90%
4-6	21	17.21%
More than 6	2	1.64%
Others		
43	35.25%	
Total	122	100%

Resource Protection and Rehabilitation

The results for the marine ecosystem that are commonly thriving is 4.45, which means all marine ecosystem reveal in the table 3 a score of 4.97 are still highly existing in Malita, Davao Occidental. During the interview, 4.97 score from the respondents confirmed that mangrove ecosystem is dominant ecosystem found in Malita most areas exhibit high survival of mangroves was basically due to local initiatives employed by the local settlers living near the area. Philippines also suffer from severe human caused environmental degradation compounded by a high rate of annual population growth, including loss of agricultural land, deforestation, soil erosion, contamination of air and water, improper disposal of solid waste and toxic waste, coral reefs and coastal resources mismanagement and violence, and overfishing (Ocampo and Eross, 2010).

Table 3. Marine ecosystem commonly thriving in Malita, Davao Occidental

PARTICULARS	N	MEAN	STD. DEVIATION	QUALITATIVE DESCRIPTION
Mangrove	122	4.97	.220	Highly visible
Sea grass	122	4.34	.943	Highly visible
Coral reef	122	4.32	.947	Highly visible
Estuaries	122	4.61	.581	Highly visible
Marshes	122	3.98	1.42	Moderately visible
Over all Mean		4.45	.970	Highly Visible

Agencies

The respondents results as shown in Table 4 with an over all mean score of 4.27, which described that all the agencies are highly existing in working on resource protection and rehabilitation efforts. Community involvement is identified as they key factor for success (Pacyao and Llamag, 2018). It recognizes the importance of active participation of local fisherfolk and coastal communities (Philippine Fisheries Code, 1998). SPAMAST under academe and BFAR agency obtains highest mean score of 5.00, which means these are the

agencies that is highly visible in working on resource protection and rehabilitation efforts. The whole process need to ensure the strong engagement with relevant stakeholders (Pomeroy *et al.*, 2013), including identifying the key person, arranging effective discussion and conducting broad and effective dissemination.

Table 4. Agencies that are working on resource protection and rehabilitation

PARTICULARS	N	MEAN	STD. DEVIATION	QUALITATIVE DESCRIPTION
DA	122	3.72	.549	Moderately visible
DENR	122	3.10	.434	Fairly visible
SPAMAST	122	5.00	.091	Highly visible
BFAR	122	5.00	.000	Highly visible
LGU/OMAF	122	4.70	.462	Highly visible
Others:				
PNP/Coastguard	79	4.01	.113	Moderately visible
Over all Mean		4.27	.806	Highly Visible

CONCLUSION

The study reveals that while there are strong community-driven efforts in mangrove conservation and coastal resource management in Malita, Davao Occidental, significant challenges persist in enforcing fishery laws, rehabilitating seagrass habitats, and implementing sustainable fishery practices. Stakeholders, particularly SPAMAST and BFAR, play a crucial role in conservation efforts, but weak enforcement mechanisms and budget constraints hinder long-term sustainability. While marine protected areas and mangrove rehabilitation programs show high visibility, the lack of focus on seagrass restoration and weak enforcement of fishery regulations pose risks to biodiversity and ecosystem stability. Strengthening law enforcement, increasing funding for marine conservation programs, and expanding public awareness through Information, Education, and Communication (IEC) campaigns are necessary to enhance the effectiveness of coastal resource management. Addressing these gaps will ensure the protection and sustainability of the marine ecosystem in Malita, Davao Occidental, benefiting both the environment and the local communities dependent on these resources.

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CONFLICT OF INTEREST

Authors declare no conflict of interest.

DECLARATION OF REGENERATIVE AI

AI was used as a tool for proofreading to enhance grammar and check for misspelled words only.

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