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Socio-economic status of fisher folks in San Miguel Bay, Philippines: A path to uplifting lives

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Abstract

The Philippines is among the world's leading fish-producing nations, yet poverty remains prevalent among small-scale fisherfolk. In San Miguel Bay, a major municipal fishing ground, fisher households face economic insecurity and limited education despite abundant marine resources. This study examined the socio-economic status of fishing families in Calabanga, Camarines Sur to inform targeted rural development, aligned with the Agricultural and Fisheries Modernization Act and Sustainable Development Goals. A mixed-methods design was employed, incorporating researcher-developed questionnaires, focus group discussions, and one-on-one interviews. Purposive sampling identified active fisherfolk endorsed by the Municipal Agriculture Office. Descriptive statistics summarized socio-economic indicators, while chi-square tests assessed associations between educational attainment and economic variables including income, years in fishing, savings, and asset ownership. Respondents were primarily male Millennials and Gen-X fishers, married, and non-college graduates. Fishing served as the main livelihood for 99.6% of households. Most belonged to low-income brackets, lacked formal savings, and had no house-and-lot ownership. Many children were out of school or had dropped out. Statistical testing revealed no significant association between educational attainment and income level, years in fishing, or savings ($p > 0.05$). Despite economic vulnerability, over half expressed strong willingness to attend training and pursue alternative livelihoods. Socio-economic hardship among fisherfolk is driven not solely by education limitations but also by structural constraints such as lack of capital, equipment, training access, and institutional support. Holistic development pathways are necessary to uplift coastal communities. An Integrated Coastal Community Development Framework was developed to guide LGU-academic-agency partnerships in implementing literacy, technical-vocational training, livelihood diversification, and sustainable fisheries programs.

Keywords: fisherfolk, socio-economic status, San Miguel Bay, rural poverty, coastal livelihoods, AFMA, community development, Philippines, capacity-building, sustainable fisheries

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1. Introduction

The Philippines, an archipelago of 7,107 islands, is endowed with extensive marine and coastal resources that historically sustained high levels of fisheries production and provided livelihood for millions of Filipinos. Fishing is the country's second staple food source after rice and plays a critical role in national food security (FAO, 2014). In 2012, the Philippines ranked seventh among the world's top fish-producing nations, generating 4.87 million metric tons of aquatic products including fish, crustaceans, mollusks, and aquatic plants (FAO, 2014). These abundant marine resources have traditionally supported coastal communities, where fishing is deeply embedded in cultural, social, and economic life. However, despite its rich aquatic resources and potential for economic growth, the Philippine fisheries sector contributes only 5–6% to the Gross National Product due to resource degradation, weak governance, and limited modernization efforts (Israel & Banzon, 2020; BFAR, 2021). As a result, more than one million small-scale fisherfolk across coastal villages experience chronic poverty and precarious living standards (PSA, 2022). Studies confirm that small-scale fishers are among the poorest occupational groups in the country, struggling with inconsistent income, limited access to productive assets, and vulnerability to environmental and economic shocks (World Bank, 2021; Muallil et al., 2019; Pomeroy et al., 2021).

National socioeconomic indicators also reflect broader development challenges. As of 2021, the Philippines has a population of approximately 113.9 million, with 29.1% below 15 years of age and 18.1% living below the poverty threshold (PSA, 2022). About 14.5% of the population suffers from malnutrition, demonstrating food security challenges despite rich natural resources (UNICEF, 2022). This paradox underscores the urgency of strengthening domestic food production and addressing rural poverty, in alignment with Sustainable Development Goals (SDG 1: No Poverty; SDG 2: Zero Hunger).

To address these challenges, collaborative action between government, private sector, academic institutions, and coastal communities is essential. Republic Act 8435, or the Agricultural and Fisheries Modernization Act of 1997 (AFMA), mandates the transformation of agriculture and fisheries into technologically advanced, globally competitive sectors, and seeks to ensure equitable access to resources, services, and training for small farmers and fisherfolk. AFMA also established the National Agriculture and Fisheries Education System (NAFES) to enhance human capital development through quality education and extension support (DA-NAFES, 2021). Literature emphasizes that academic institutions are pivotal in enabling rural development, empowering communities, and supporting poverty reduction through training, research, and community-based extension services (Atchoarena & Holmes, 2004; Adriano & Dizon, 2019).

The fishing industry thus holds significant promise not only for economic growth but also for improving the quality of life among marginalized fishing communities. Central Bicol State University of Agriculture, in collaboration with government and fisheries agencies, is positioned to provide technology, capacity-building, and cooperative development support to local fisherfolk—initiatives consistent with national development goals and international best practices for coastal community resilience (FAO & SEAFDEC, 2020; Pomeroy et al., 2021). Given limited awareness of fisheries regulations and sustainable practices among many fisher households, technical assistance and community-based education are crucial to improving compliance, resource stewardship, and livelihood resilience (Garcia et al., 2020).

Understanding the socio-economic status of fisherfolk is a foundational step toward designing effective interventions. Socioeconomic status—commonly assessed through income, education, and occupation—determines access to livelihood opportunities, technology adoption, and community participation (Adriano & Dizon, 2019). Profiling enables targeted extension programs that address capacity gaps, support sustainable fishing

practices, and enhance livelihood diversification in line with AFMA's modernization agenda.

Calabanga, the fifth largest commercial center in Camarines Sur and 11th in the Bicol Region, has abundant uplands and productive fishing grounds, including San Miguel Bay, the Bicol River, and several inland water systems. These support diverse marine products such as fish, shrimp, oysters, and crabs, which supply regional markets as far as Manila. Fishing, agriculture, and livestock remain major livelihood activities, with most residents in coastal barangays engaged in fisheries. Despite this natural wealth, many households face socio-economic challenges, similar to other coastal communities nationwide.

This study, therefore, investigates the socio-economic status of fisherfolk households in Calabanga, Camarines Sur—focusing on education, livelihood, income, and assets—and aims to develop a community-based program framework for local government and academic institutions to enhance educational access, promote technology adoption, and strengthen sustainable fisheries-based livelihoods.

Objectives

General - This study aims to investigate the socio-economic status of the fishing families in the coastal barangays of Calabanga, Camarines Sur.

Specific

- Describe the fishing families' socio demographic and educational attainment, and socio-economic status;
- Look into the relation of socio-economic status of fishing families and their educational attainment;
- Design a program framework for local government unit to provide education to fishing families; and
- Develop Extension Services to promote education as a tool to uplift the lives of the fishing families.

2. Methodology

Data Collection - A researcher-developed questionnaire served as the primary tool for assessing the socio-economic status and educational attainment of the participants in the study. Data were collected through a multifaceted approach to ensure comprehensive insights into the subject population. Respondents are also selected because their source of income is from capture fishing. And they are indorsed by the Local Government Unit of Calabanga- Municipal Agriculture Office as fisher folks.

Focused Group Discussions - Focused group discussions were conducted in each barangay to facilitate in-depth data collection. These sessions enabled the research team to engage with community members, understand their perspectives, and garner qualitative information about their socioeconomic status and educational backgrounds.

Questionnaire Distribution - A structured questionnaire was distributed to the participants after the focused group discussions. The questionnaire was designed to gather quantitative data, offering a broader perspective on the respondents' socio-economic status and educational attainment.

One-on-One Interviews - To ensure a more nuanced understanding of individual experiences, one-on-one interviews were conducted with selected participants on the same day as the questionnaire distribution. These interviews allowed participants to express their unique circumstances and challenges.

Sampling - The selection of respondent barangays was carried out using a purposive sampling method. This approach targeted specific communities that were representative of the study area's fishing population, ensuring the collected data's relevance and accuracy.

Data Analysis - Data obtained from the questionnaire, focused group discussions, and one-on-one interviews

were subjected to a rigorous analysis using appropriate statistical tools. The following techniques were employed:

Descriptive Statistics - Mean and average weighted mean calculations were utilized to provide a concise overview of the data, offering critical insights into the central tendencies and distribution of variables related to socioeconomic status and educational attainment.

Correlational Analysis - A correlational analysis examined the relationships between socioeconomic status and educational attainment. This statistical method helped reveal the degree and direction of any associations between these two critical variables.

Development Framework Design - In constructing the development framework for this study, an input-output model served as the guiding structure. The input phase of the model encompassed several key variables from the external environment, which included critical socio-economic factors such as age, educational attainment, income sources, actual income, and family size. These inputs formed the foundation for the subsequent stages of the model. The core of the system revolved around a three-step process. The first stage involved comprehensive data collection, where extensive information on the socio-economic profile of fishing families was gathered. This robust dataset was then meticulously recorded, organized, and prepared for analysis. The final and crucial step in the process was data analysis, in which rigorous statistical methods were applied to unearth valuable insights within the collected data. The outcomes of this transformation process constituted the outputs. As envisaged in the conceptual model, the primary output was the "Promotion of Education." This outcome was intricately linked to the socio-economic profile of fishing families, and the insights derived from the data analysis played a pivotal role in shaping the development framework. Overall, this development framework, structured around the input-output model, aimed to harness socio-economic insights as a catalyst for crafting targeted interventions geared toward enhancing education within fishing communities. The results from the data collected in the field, combined with relevant insights from the existing literature, served as the foundation for designing a comprehensive development framework. This framework assisted local government units in identifying and delivering priority interventions for the target fishing communities.

Framework of the Study

Conceptual - Input-output model was used. It includes all those materials and information required for the process, details of the process itself, and descriptions of all products resulting from the process. It simply identifies the inputs, outputs and processing tasks required to transform inputs into outputs. An Input variable is something from the external environment that is fed into the system. The data input is provided by an external entity. The inputs may be raw data “captured” in some way or pre-existing data which has been provided by an external system. The input variables are socio-economic profile (age, educational attainment, source of income, income, size of the family). The process includes all tasks required to effect a transformation of the inputs into outputs. It accepts the input into the system and performs some types of operation. The process is simply the heart of any system and the transformation process is the most important element of a system. In this study the process involved the collection of data, recording of data and analysis of the data. The outputs are the data and materials flowing out of the transformation process. Without the output, a system has no link back into its external environment which is the result of processing the input. Promotion of education is the output perceived in the conceptual model as a result after determining the socio-economic profile of fishing families.

3. Results and discussion

Socio Demographic Profile - Table 1 below shows the socio-demographic profile of the fishing families at Calabanga, Camarines Sur. In terms of personal profile, 48.41% of the fisher folks belong to age range of 26 to 41 years old and 33.33 % belong to 42 to 57 years old. 93.8% of fishermen are male while only 6.2% are female. 88% of the fisher folks are married, and 72.31% have 6 children and below. In terms of educational background, 88.93% are did not attend college, while 10.67% attended college. In terms of organization affiliation, 85.38% have no affiliation in any organization, while only 14.62% are affiliated. 99.60% of the fisher folks, indicated that fishing

is their only source of income.

Table 1
Socio-demographic profile of Calabanga, Camarines Sur fishing families.

Socio-Demographic	Frequency n=253	Percentage
A. Personal profile		
Age		
25 & below (Gen Z)	24	9.52
26 - 41 y/o (Millennials)	122	48.41
42-57 y/o (Gen X)	84	33.33
58-76 y/o (Boomers)	22	8.73
Sex		
Male	213	93.8
Female	14	6.2
Civil Status		
Single	28	11.48
Married	216	88.52
No. of Children		
6 & Below	175	72.31
7-12	63	26.03
13 & above	4	1.65
B. Educational Attainment		
Non-College	225	88.93
College Level	27	10.67
C. Organization Affiliation		
With affiliation	37	14.62
Without affiliation	216	85.38
D. Source of Income/Work		
Fishing	252	99.60
With other income source	1	0.40

The table also reveals that fisher folks are mostly millennials and generation X. They are dominated by male, married, and non-college level. The fisher folks have no affiliation to any organization except those in Barangay Manguiring who are adopted by Universidad de Sta. Isabel. This further means that future extension programs shall consider the forgoing data as baseline information to ensure that the programs are responsive to the target participants. Based from the focus group discussions, the fishing families of Millennials need other trainings on technical-vocational skills, best practices on responsible fishing and food processing. In addition, since mostly of them did not attend college, the fisher folks prefer hands-on training using contextualized language and training materials. They are hesitant to establish any organization but open to some orientations regarding the benefits of having a fisher folks' organization. Lastly, they mentioned also that they are interested to try new source of income aside from fishing, and they are very willing to learn other skills. The baseline data presented above can be used as primary considerations in extending the available innovative technologies of CBSUA Calabanga Campus and other partner agencies. It can be noted that the needs mentioned above can be addressed by extension activities such as literacy program, strategic management program, career guidance counselling, technical vocational training, food processing and marketing, and tourism related projects to create more business and employment opportunities.

Socio Economic Profile - Table 2 below presents the socio-economic profile of the fishing families in Calabanga, Camarines Sur. The foregoing tabulations revealed that 89.63% of the fishing families do not own real property like house and lot. 57.99% of the fishing families have been into fishing for 16 years and above. 86.25% belong to low-income group and 56.73% do not save money. The children of 68.88% of the fishing families are not attending school while 73.57% of their children dropped out from school. In terms of mode of fishing, the four barangays have varied modes of fishing, Barangay Cagsao used "Timbog", Barangays Sibobo and Manguiring used "Pangking Pangsera"/"Pangasag", while Barangay Sabang used "Trol"/"Galagad"/"Kuto-kuto" and "Hudhod Kalikot". 54.33% of the fishing families signified their willingness to attend any training that would enhance their skills and productivity. Some of the requested trainings include technical vocational courses like automotive,

electrical and welding. They are also willing to attend financial literacy and language literacy programs.

Table 2
Socio-economic profile of Calabanga, Camarines Sur fisherfolks

Socio-Economic Profile	Frequency n=253	Percentage
House Ownership		
With own house	35	14.52
Without own house	216	89.63
No. of Years in Fishing work		
15 years & Below	92	42.01
16 years & Above	127	57.99
Monthly Income		
Below 12,000	207	86.25
12,000 & Above	33	13.75
Practice Saving		
Yes	106	43.27
No	139	56.73
Children attending school		
Yes	75	31.12
No	166	68.88
With children dropped from school		
Yes	167	73.57
No	60	26.43
Mode of Fishing		
Pangking Pangsera/Pangasag	82	17.74
Trol/Galagad/Kuto-kuto	93	37.50
Timbog	53	21.37
Hudhod Kalikot	58	23.39
Willingness to attend training		
Yes	113	54.33
No	95	45.67

The data reveals that most of the fishing families are informal settlers along the coastal area which is prone to natural calamity. According to the focus group discussion results, fishing is considered as source of income by tradition, but unfortunately the fishing families remained in the low income status. Some of them save in piggy bank inside their own house and others save in CARD Bank as part of their loan amortization savings. Because of financial constraint, they cannot afford to send their children to schools or continue supporting their children. The fishing mode of every barangay is based on the available fishing resources. In addition, many are open to new knowledge and skills training as opportunity for livelihood and additional source of income. This further means that there is a need for disaster risk orientation program to mitigate the impact of natural calamities to their safety, livelihood, health, and property since they live in a disaster-prone area. Financial literacy is necessary to equip the fisher folks with knowledge to handle resources for emergency purposes and capital for additional business venture. Furthermore, career guidance and counseling for out of school youth are necessary to educate the families of their right to access services from the LGU and other government agencies. According to the fishing families, they are open for trainings on new knowledge to have an option to breed and culture any kind of fish to add to the fish resources and improve the diversity in San Miguel Bay. The needs and challenges mentioned above are significant areas for the extension services of CBSUA to extend and address the concerns of the most vulnerable fishing families of Calabanga, Camarines Sur.

Table 3 reveals the test of relationship between the fishing family's educational attainment and their economic profile. The computed chi-square (X2) value between the educational attainment of the fishing families in relation to income is .645 (where p=422). Years in fishing has X2 value of 1.941 (where p=.164), House ownership has X2 value of 2.878 (where p=.090), and savings has X2 value of 1.369 (where p=242). With all parameters having 1 degree of freedom at .05 level of significance resulted to the rejection of the hypothesis. This means that the educational attainment of the fishing families of Calabanga, Camarines Sur along San Miguel Bay is not significantly associated with their income, years in fishing work, house ownership, and savings.

Table 3
Chi-square test of association between fishing family's educational attainment and economic profile

Socio-Economic Variables	df	Chi-Square Value Computed	p-value	Interpretation
Income	1	.645	.422	Not Significant
Years in Fishing work	1	1.941	.164	Not Significant
House Ownership	1	2.878	.090	Not Significant
Savings	1	1.369	.242	Not Significant

In addition, during the focus group discussion, it was mentioned by the fishing families that the constraints affecting their economic status are brought about by the absence of available fishing equipment, capital, and processing equipment. They also added they lack relevant knowledge and skills in financial management, processing, marketing, and they lack support from government agencies, and established organizations. To address the needs of fisher folks, a comprehensive framework can be developed.

Table 4
Cross tabulation of Educational attainment and Other Profile of Fishing Families of Calabanga, Camarines Sur

Profile	Educational Attainment Non-College Graduate		College Graduate		Total	
	Freq.	%	Freq.	%		
Income						
Below 12,000	187	78.57	19	7.98	187	86.55
12, 000 & Above	27	11.34	5	2.10	27	13.45
Years in Service						
15 years and below	76	34.7	14	6.39	76	41.10
16 years & above	118	53.9	11	5.02	118	58.90
House ownership						
None House Ownership	28	11.24	7	2.81	28	14.06
With House Ownership	195	78.31	19	7.63	195	85.94
Savings						
Yes	120	48.78	18	7.29	120	56.10
No	98	39.84	8	3.24	98	43.90

Table 4 presents the cross tabulation of the educational attainment and other profile of the fishing families. In terms of income, it can be highlighted that mostly of families have monthly family income below 12,000 or 86.55%. Among these, Non-College graduate families have the most numbered with 187 or 78.57%. In terms of years of service, Non-College Graduate 76 or 34.7 % has 15 years and below have the most numbered fishing families and Non-College Graduate fishing families 118 or 53.9 % for 16 years & above. In terms of House Ownership, the most numbered of fishing families with no house ownership is 28 or 11.24 % is Non-College Graduate and most numbered of Non-College Graduate is with house ownership which is 195 or 78.91 %. Furthermore, for Savings of Non-College Graduate is having a most numbered with savings 120 or 48.78 % and without savings of 98 or 39.84%. Table 4 reveals that most of the fishing families is a Non-College Graduate belonging to an Income Below 12,000 pesos with 16 years & above years in Service. However, if even most of the Fishing families is Non-College Graduate most of the families own their houses and most numbered of families has savings.

Table 5
Willingness of Fishing Families to attend Literacy Program

Barangay	Frequency n=253	Percentage
Sabang	87	34.39
Sibobo	20	7. 91
Cagsao	21	8.30
Manguiring	19	7.51
TOTAL	147	58.10

Table 5 shows the level of willingness of the fishing families to attend Literacy Program. The foregoing tabulations revealed that at a total of the 58.10% of the respondents are willing to attend literacy program. Most

of the programs requested are TESDA courses like automotive, welding, electrical, livelihood training, orientation on fishing laws and fish processing

Program Framework

Figure 1. Program Framework

1. Needs Assessment:

A thorough needs assessment in collaboration with local fisher folks must be conducted to understand their specific challenges, opportunities, and aspirations. There is also a need to identify key areas where financial support, training, and alternative livelihoods are required.

2. Financial Support:

A dedicated fund which is managed with transparency and accountability should be establish to provide financial support to fisher folks. Direct financial assistance should be provided for essential needs such as equipment, boats, safety gear, and repairs. Offer low-interest loans or microfinance options should be offered to fisher folks to in able them to invest in their fishing enterprises. Insurance programs should be developed to mitigate risks associated with fishing activities.

3. Training and Capacity Building:

Training programs should be designed and implemented, tailored to the needs of fisher folks, covering areas such as sustainable fishing practices, marine conservation, safety at sea, and financial management. Local institutions, NGOs, and experts should collaborate to develop specialized training modules. Knowledge exchange between experienced fisher folks and newcomers should be promoted to ensure intergenerational learning. Technical Vocational Courses of TESDA Casifmas can be offered to fishing families like Automotives NCII, Electronics NCII, Refrigeration and Air- conditioning NCII and other skill-based training.

4. Alternative Livelihood:

Alternative income-generating activities that can supplement fishing income during off-seasons and fishing restrictions should be identified and promoted. Vocational training and aquaculture, fish processing, boat repair, ecotourism, and handicrafts should be provided. Market linkages for alternative livelihood products to ensure a sustainable customer base should be developed.

5. Community Empowerment:

Community-based organizations or cooperatives to enhance collective bargaining power, resource management, and decision-making should be establish. Participatory processes that involve fisherfolks in designing and implementing development interventions should be facilitated. The participation of women in these initiatives should be encourage.

6. Sustainable Resource Management:

Sustainable fishing practices into training programs, emphasizing responsible harvesting, selective fishing, and adherence to local fishing regulations should be Integrate. The establishment of marine protected areas and sustainable fishing zones to ensure long-term resource availability should be promoted.

7. Monitoring and Evaluation:

A robust monitoring and evaluation system should be set up to assess the impact of the framework's interventions on fisher folks' well-being and the overall community development. The data on indicators such as income levels, skill development, livelihood diversification, and ecosystem health should be regularly collected.

8. Policy and Advocacy:

Relevant Governmental agencies should collaborate in advocating for supportive policies that address the needs of fisher folks. The contributions of fisher folks to food security, economic growth, and environmental conservation should be recognized.

9. Long-Term Sustainability:

The framework's sustainability should be ensured by building local capacity to manage and adapt the initiatives over time. Research and innovation should be encouraged for continuous improvement in fishing techniques, resource management, and livelihood options. By implementing this Integrated Coastal Community Development Framework, fisher folks can be better equipped to overcome challenges, achieve sustainable livelihoods, and contribute to the well-being of their communities while preserving marine ecosystems. A training cum capacity building proposal may be presented to the university as an extension initiative following this research.

4. Conclusions

From the foregoing results and tests of hypothesis, the following conclusion are drawn:

- The fishing families typically belong to the low income group with low level of educational attainment and lack trainings.
- The educational attainment of the fishing families of the Calabanga, Camarines Sur along San Miguel Bay is not significantly associated with their income, years in fishing work, house ownership, and savings.
- The economic status of fishing families is limited by the lack of fishing equipment, capital, and processing equipment.
- The fishing families also lack relevant trainings for financial management, processing, marketing, technical skills, and support from government agencies and established organizations.

Recommendations:

- Conduct a literacy program on Language, Financial, and other Livelihood.
- Conduct a Career Guidance Counselling.
- Conduct orientation of the laws governing fishing and marine protection.

- Conduct more studies on Fisheries like providing breeding station of sanctuary for marine life.
- The proposed Integrated Coastal Community Development Framework discussed in this research should be adopted to aid the university and the local government unit in developing initiatives that would benefit the fishing families in the coastal barangays of Calabanga Camarines Sur.

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