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LIVELIHOOD SUSTAINABILITY AND COMMUNITY STABILITY AMONG FISHING HOUSEHOLDS: A CASE STUDY OF BARANGAY DALADAGAN, LAKE MANGUDADATU

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ABSTRACT

This study investigated the relationship between Livelihood Sustainability and Community Stability among small-scale fishing households in Barangay Daladagan, Lake Mangudadatu, Maguindanao del Sur. Utilizing a descriptive-correlational research design, data were gathered from a total census of 30 active fishing households. The socioeconomic profile of the respondents revealed a community tightly bound by economic limitations, characterized by a predominantly mature demographic (45.0% aged 51 and above), medium-to-large household sizes (60.0% with 5–7 members), a heavy reliance on traditional open-water capture fishing (60.0%), and severe financial constraints, with 60.0% of households subsisting on an average monthly income below ₱5,000.

The study concludes that individual socioeconomic poverty does not automatically dictate or compromise structural community peace within this rural fishing ecosystem. The exceptional social order in Barangay Daladagan stands independently resilient, effectively buffered by internal social cohesion and cooperative trust. Based on these findings, it is recommended that government bodies (such as BFAR and local LGUs) implement targeted environmental and financial interventions—specifically lake water quality rehabilitation and accessible micro-credit tracks—while academic institutions leverage these unique community findings to develop localized financial literacy, place-based ecological curricula, and values education modules focused on rural social capital.

Keyword: Livelihood Sustainability, Community Stability, Pearson r, Fishing Households, Lake Mangudadatu, Socioeconomic Resilience

1. INTRODUCTION

1.1. Background of the Study

Fishing remains one of the most important sources of livelihood for rural communities in the Philippines. Thousands of households depend on inland and coastal fisheries not only for income but also for food security and social well-being. However, fishing households often face numerous challenges, including declining fish stocks, environmental degradation, climate change impacts, limited access to alternative sources of income, and economic instability. These challenges affect the sustainability of their livelihoods and the overall stability of their communities.

Freshwater lakes serve as critical ecological and economic lifelines for rural communities across developing nations, providing primary sources of protein, employment, and income through aquaculture and capture fisheries (FAO, 2022). In the Philippines, inland fisheries play a pivotal role in poverty alleviation and food security, particularly in municipal waters where small-scale fishing households rely entirely on aquatic resources for daily sustenance (BFAR, 2023). However, the long-term viability of these ecosystems is increasingly threatened by overexploitation, environmental degradation, and socioeconomic vulnerabilities, placing the communities that depend on them in precarious positions. Various livelihood programs have been implemented to improve the welfare of fishing households. However, research indicates that many livelihood interventions experience limited long-term success due to inadequate planning, lack of market access, insufficient training, and failure to address the root causes of vulnerability among fisherfolk. Sustainable livelihood development requires not only economic

assistance but also community participation, capacity building, and institutional support.

In the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), Lake Mangudadatu (geographically continuous with Lake Buluan) stands as the largest lake in the province of Maguindanao del Sur and the third-largest on the island of Mindanao. The lake is shallow, nutrient-rich, and characterized by intensive tilapia (*Oreochromis niloticus*) and carp aquaculture operations (Opena et al., 2021). For decades, these waters have driven the local economy, positioning Maguindanao as a major contributor to regional inland fish production.

The concept of livelihood sustainability refers to the ability of households to maintain and improve their means of living while coping with shocks, stresses, and changing environmental conditions. Sustainable livelihoods are characterized by the effective use of available resources, diversified income opportunities, and resilience against economic and environmental risks. Studies have shown that fishing communities with diversified livelihood sources and strong social support systems are better able to withstand economic and environmental uncertainties.

Community stability, on the other hand, pertains to the capacity of a community to maintain social cohesion, economic security, and collective well-being over time. Stable communities are characterized by strong social relationships, active community participation, low levels of conflict, and the ability to adapt to changing circumstances. In fishing communities, livelihood sustainability and community stability are closely interconnected because the economic condition of households directly influences social relationships, educational opportunities, health outcomes, and local development.

Despite its economic bounty, the fishing households surrounding Lake Mangudadatu, particularly in coastal villages like Barangay Daladagan, face multi-dimensional challenges. Livelihood sustainability is constantly tested by fluctuating market prices, the rising cost of production inputs (such as fingerlings and commercial feeds), localized climate shifts, and seasonal fish kills. When these primary livelihoods are disrupted, the broader community stability—manifested through household food security, social cohesion, and peace and order—is directly compromised.

While regional development plans emphasize macroeconomic agricultural growth (Bangsamoro Planning and Development Authority [BPDA], 2023), there is a critical shortage of localized, empirical data on how small-scale fishing households cope with these shifting ecological and economic pressures. This study addresses this gap by investigating the intersection of livelihood sustainability and community stability among the fishing households of Barangay Daladagan, Lake Mangudadatu. The findings of this study may provide valuable insights for local government units, fisheries agencies, community organizations, and other stakeholders in developing strategies that strengthen both household livelihoods and community resilience.

1.2. Objectives

1. To determine the level of livelihood sustainability among fishing households.
2. To assess the level of community stability in Barangay Daladagan.
3. To identify common challenges experienced by fishing households.
4. To determine the relationship between livelihood sustainability and community stability.
5. To recommend strategies that may improve the welfare and resilience of fishing households.

1.3. Statement of the Problem

This study aims to determine the relationship between livelihood sustainability and community stability among fishing households in Barangay Daladagan, Lake Mangudadatu.

Specifically, it seeks to answer the following questions:

1. What is the demographic profile of the respondents in terms of:
    - Age;
    - Sex;
    - Educational attainment;
    - Household size; and

- Number of years engaged in fishing?

2. What is the level of livelihood sustainability among fishing households in terms of:
    - Economic sustainability;
    - Environmental sustainability; and
    - Social sustainability?
3. What is the level of community stability in terms of:
    - Social cohesion;
    - Community participation;
    - Economic security; and
    - Resilience to environmental and economic challenges?
4. Is there a significant relationship between livelihood sustainability and community stability among fishing households in Barangay Daladagan, Lake Mangudadatu?
5. What recommendations can be proposed based on the findings of the study?

1.4. Hypotheses of the Study

The study will test the following null hypothesis:

H_0: There is no significant relationship between livelihood sustainability and community stability among fishing households in Barangay Daladagan, Lake Mangudadatu.

H_1: There is a significant relationship between livelihood sustainability and community stability among fishing households in Barangay Daladagan, Lake Mangudadatu.

1.5. Scope and Delimitation of the Study

This study focuses on the livelihood sustainability and community stability among fishing households in Barangay Daladagan, Lake Mangudadatu, Maguindanao del Sur. The respondents will consist of selected fishing households residing in the barangay.

The study will assess livelihood sustainability in terms of economic, environmental, and social dimensions, while community stability will be examined through social cohesion, community participation, economic security, and resilience. Data will be collected through survey questionnaires and analyzed using appropriate statistical tools.

The study is limited to fishing households within Barangay Daladagan and does not include other communities surrounding Lake Mangudadatu. Therefore, the findings may not be generalized to all fishing communities in the Philippines.

2. CHAPTER 3: METHODOLOGY

2.1. Research Design

This study employs a descriptive-correlational research design utilizing a quantitative approach supplemented by key informant interviews (KIIs). A descriptive design is highly appropriate for short-term research as it captures a precise, cross-sectional "snapshot" of the socioeconomic profile, livelihood status, and stability markers at a specific point in time (Creswell & Creswell, 2018).

The correlational component is used to evaluate the direction and strength of the relationship between the independent variable (Livelihood Sustainability Factors) and the dependent variable (Community Stability Indicators) without manipulating the variables.

2.2. Locale of the Study

The study will be conducted exclusively in Barangay Daladagan, an institutional lakeside village situated within the municipality of Mangudadatu, Maguindanao del Sur, Philippines.

Barangay Daladagan sits directly on the northern banks of **Lake Mangudadatu** (historically and geographically integrated with the greater Lake Buluan basin). Based on the official census data from the Philippine Statistics Authority (PSA), there are 475 households. The community's geographic proximity to the water makes it a primary hub for municipal aquaculture, characterized by dense corridors of floating tilapia and carp fish cages. This specific setting provides an ideal environment for investigating how direct ecological dependencies shape localized community harmony and financial survival.

2.3. Respondents and Sampling Procedure

The target population for this study comprises the heads of households residing in Barangay Daladagan whose primary source of daily income is derived from municipal fishing activities. This

includes both open-water capture fishers and fish-cage aquaculture operators.

Due to the constraints of a short-term research timeline, purposive sampling will be utilized to select a total sample size of 30 household heads. The strict inclusion criteria for respondents are as follows:

1. The respondent must be the recognized head of the household;
2. The household must have resided in Barangay Daladagan for at least two consecutive years; and
3. The household's absolute primary source of monthly income must come directly from fishing or managing fish cages on Lake Mangudadatu.

Additionally, three (3) key informants—consisting of a Barangay Council official, a local elder, and a representative from a localized fishing association or cooperative—will be selected to participate in structured interviews to provide institutional context.

2.4. Research Instrument

The primary data collection tool is a structured, researcher-constructed Survey Questionnaire, translated locally into *Maguindanaon* during actual delivery to eliminate language barriers. The instrument is divided into three distinct parts:

Part I: Socioeconomic Profile**:** Gathers baseline categorical data including age, household size, primary fishing activity, and average monthly household income.

Part II: Livelihood Sustainability Index**:** Measures the independent variables (Resource Availability, Financial/Market Access, and Environmental Resilience) using a 4-point Likert Scale.

Part III: Community Stability Index**:** Measures the dependent variables (Food Security, Institutional Engagement, and Social Peace) using a parallel 4-point Likert Scale.

The Likert scale metrics will be weighted and interpreted based on the following statistical intervals:

Weighted Mean Interval	Livelihood Sustainability Meaning	Community Stability Meaning
3.50 – 4.00	Highly Sustainable	Highly Stable
2.50 – 3.49	Sustainable	Stable
1.50 – 2.49	Vulnerable	Unstable
1.00 – 1.49	Highly Vulnerable	Highly Unstable

2.5. Data Collection Protocol

To ensure ethical compliance and systematic flow within a short-term timeline, data collection follows a structured four-stage process:

Clearances & Courtesy Visits

Secure LGU endorsement and present a courtesy letter to the Daladagan Barangay Captain to ensure safety and community access.

Consent & Orientation

Explain research goals to selected respondents; acquire signed or thumb-printed, Informed Consent Forms ensuring absolute anonymity and data privacy.

Survey Administration

Conduct face-to-face, researcher-assisted questionnaire styling to clarify indicators inline for the 80 purposively selected households.

Triangulation & Key Informant Interviews (KIIs)

Conduct separate, semi-structured qualitative interviews with 3 local leaders to contextualize and validate survey trendsData Analysis and Statistical Tools

The gathered quantitative data will be encoded, cleaned, and statistically processed using specialized software. The specific tools assigned per objective are:

1. Descriptive Statistics (Frequency, Percentage, and Weighted Mean): Used to summarize the socioeconomic profile of the household heads and to establish the baseline scores for livelihood sustainability and community stability (Objectives 1, 2, and 3).
2. Inferential Statistics (Pearson Product-Moment Correlation Coefficient - r): Used to test the null hypothesis (ά = 0.05) and evaluate whether a significant relationship exists between the sustainability scores and the stability markers of the community (Objective 4).

$$\text{Pearson } r = \frac{n(\sum x\, y) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Where x represents the composite mean scores of Livelihood Sustainability and y represents the composite scores of Community Stability.

3.CHAPTER 4: RESULTS AND DISCUSSION

The presentations are organized sequentially to address the specific research questions established in the Statement of the Problem.

3.1. Demographic and Socioeconomic Profile of the Respondents

A total of 30 fishing household heads from Barangay Daladagan served as respondents for this study. The demographic and socioeconomic data points are critical, as household structures directly dictate a small-scale fisher's adaptive capacity to economic and ecological shocks (Opena et al., 2021).

Table 1. Socioeconomic Profile of the Respondents (N = 30)

Profile Variable	Frequency(f)	Percentage(%)
Age		
21–35 years old	**12**	**40%**
36–50 years old	**10**	**33.3%**
51 years old and above	**8**	**26.7%**
Household Size		
Small (1–4 members)	**5**	**16.7 %**
Medium (5–7 members)	**18**	**60 %**
Large (8 members and above)	**7**	**23.3%**
Primary Fishing Activity		
Fish-Cage Aquaculture (Tilapia/Carp)	**12**	**40%**
Open-Water Capture Fishing	**18**	**60%**
Average Monthly Household Income		
Below ₱5,000	**18**	**60%**
₱5,001 – ₱10,000	**10**	**33.3%**
Above ₱10,000	**2**	**6.7%**

1. Age Distribution of Respondents

The data shows that a majority of the respondents are older individuals, with 26.7% falling into the 51 years old and above bracket. Meanwhile, 40.0% belong to the 21–35 age group, and 33.3% are aged 36–50. This implies that the fishing community in Barangay Daladagan consists heavily of mature, experienced individuals, alongside a steady demographic of younger fisherfolk.

2. Household Size

In terms of household size, a substantial majority of the respondents have a medium-sized household (5–7 members), accounting for 60.0% of the sample. This is followed by large households (8 members and above) at 23.3% , and small households (1–4 members) at 16.7%. This aligns with rural community trends in Maguindanao del Sur, where extended or larger families living under one roof are quite common.

3. Primary Fishing Activity

When it comes to their primary livelihood, 60.0% of the respondents engage in Open-Water Capture Fishing, while the remaining 40.0% practice Fish-Cage Aquaculture (Tilapia/Carp). This indicates that traditional capture fishing in Lake Mangudadatu remains the primary source of income for most local fishers, though a significant portion has transitioned to managed aquaculture setups.

4. Average Monthly Household Income

The economic profile reveals that the vast majority of the fisherfolk live on low incomes. Specifically, 60.0% of the respondents earn below ₱5,000 monthly. Another 33.3% earn between ₱5,001 and ₱10,000, while only a small fraction (6.7%) earns above ₱10,000. This clearly indicates that a large portion of the fishing households in Barangay Daladagan are living below or near the poverty threshold, making them economically vulnerable.

3.2. Status of Livelihood Sustainability

Livelihood sustainability was assessed using three primary indices: Resource Availability, Financial and Market Access, and Climate/Environmental Resilience. A 4-point Likert Scale was utilized, where the mean values are interpreted as follows: *3.50–4.00 (strongly agree), 2.50–3.49 (agree), 1.50–2.49 (disagree), and 1.00–1.49 (strongly disagree)*.

Table 2. Mean Scores for Livelihood Sustainability Dimensions

Sustainability Indicators	Weighted Mean	Verbal Interpretation
1. Resource Availability		
Consistency of daily wild fish catch	**1.33**	Strongly disagree
Quality and volume of aquaculture fish harvests	**2.17**	disagree
2. Financial and Market Access		
Access to formal bank credit or microfinance	**1.63**	disagrre
Stability of farm-gate market prices for Tilapia	**2.83**	agree
3. Climate and Environmental Resilience		
Household capacity to survive a severe "fish kill" event	**2.20**	agree
Access to early warning environmental alerts from the LGU	**3.77**	Strongly agree
OVERALL COMPOSITE MEAN	**2.32**	disagree

The respondents generally experience negative or challenging conditions regarding their fishing livelihoods in Barangay Daladagan. While LGU climate alerts (Item 6) and market prices (Item 4) are relatively good, they are heavily dragged down by poor catch consistency, poor water quality, a lack of bank credit, and low savings resilience.

The overall composite mean of **2.32** indicates that the livelihoods of Barangay Daladagan's fishing households mean cannot sustain to support their families. While fish-cage harvests remain reasonably viable (Mean = 2.17) due to the nutrient-rich ecology of Lake Mangudadatu, the frameworks supporting these livelihoods are weak.

The lowest individual metric is Access to formal bank credit or microfinance **(Mean = 1.63)**. Key informant interviews revealed that because small-scale fishers lack formal land titles or collateral, they are completely excluded from traditional banking. Instead, they rely on informal local traders (*middlemen*) who advance fingerlings and commercial feeds in exchange for exclusive, low-priced rights to the harvest. This creates an economic trap that directly deflates market price stability (Mean = 2.83). Furthermore, environmental vulnerability is high. The low capacity to cope with sudden environmental changes even they have high access to environmental alerts from the LGU / local government units.

3.3. Level of Community Stability

Community stability was measured across dimensions of Food Security, Institutional Engagement (cooperatives), and Social Peace and Order. The metrics are interpreted via 4-point scale: *3.50–4.00 (Highly Stable), 2.50–3.49 (Stable), 1.50–2.49 (Unstable), and 1.00–1.49 (Highly Unstable)*.

Table 3. Mean Scores for Community Stability Dimensions

Community Stability Indicators	Weighted average mean	Verbal interpretation
1. Household Food Security		
Household relies only on fish when money for rice is low	**2.47**	**unstable**
Consistency of protein intake from the household's own catch	**3.17**	**stable**
2. Institutional Engagement		
Active membership and benefit sharing in local fishing co-ops	**3.73**	**Highly stable**
3. Social Peace and Order		
Freedom from active conflicts regarding boundary/space claims	**3.77**	**Highly Stable**
Security of fish cages against daytime or nighttime theft	**3.50**	**Stable**
OVERALL COMPOSITE MEAN	**3.33**	**stable**

The composite mean of **3.33** reflects a generally **Stable** community ecosystem, though it is balanced on a delicate edge. The social fabric of Barangay Daladagan benefits heavily from solid cultural homogeneity and traditional dispute resolution. **Social peace and boundary management score a stable** indicating that active conflicts over the lake's open space are well-controlled by tribal and barangay leaders (under the leadership of MANNY M. DINGCONG, barangay chairman), preventing resource-based violence.

However, internal indicators point to baseline economic anxiety. While the lake provides direct, stable access to protein households experience **food budget vulnerabilities (Mean = 2.47)** when attempting to secure basic staples like rice. Security against theft of mature aquaculture stocks at night also registered is stable.

Relationship Between Livelihood Sustainability and Community Stability

To determine if a statistically significant relationship exists between livelihood sustainability factors and community stability, the data underwent a Pearson Product-Moment Correlation Analysis (r) at a ά= 0.05 significance level.

Table 4. Correlation Matrix Between Livelihood Sustainability and Community Stability

Variables Correlated	Pearson r Coefficient	p-value	Interpretation	Statistical Decision
Livelihood Sustainability **vs.** Community Stability	0.142418	0.452804	Greater Positive Correlation	**Null Hypothesis Accepted**

Table 4 illustrates the correlation analysis and statistical significance between Livelihood Sustainability and Community Stability (N = 30). The calculation yielded a Pearson correlation coefficient (r) of **0.142**, pointing to a very weak, negligible positive linear relationship.

Furthermore, the regression analysis revealed a p-value (Significance F) of **0.453**. Because this value drastically exceeds the standard significance threshold ($\alpha = 0.05$), the relationship between Livelihood Sustainability and Community Stability is statistically non-significant.

Statistically, this confirms that changes or deficiencies in personal livelihood factors—such as seasonal catch drops ($m\mu = 1.33$) or low household incomes—do not have a reliable, mathematically predictable impact on structural community conditions. The null hypothesis, which states that there is no significant relationship between the two variables, is therefore accepted. This statistically underscores the fact that the exceptional peace, order, and cooperative networks observed in Barangay Daladagan ($m\mu = 3.33$) stand independently resilient against localized economic disruptions."