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Assessing the Socio-economic Profile of Coastal Villagers in Buguey, Cagayan: Inputs for Sustainable Extension Programs

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ABSTRACT

Background: Coastal communities, like in Buguey, Cagayan, are highly dependent on marine and aquatic resources and mangroves for their livelihoods and the high population pressure in coastal areas has led to the conversion of mangrove areas for human activities, impacting environmental health. With this, the study assessed the socioeconomic profile of coastal villagers in Buguey, Cagayan, to provide insights for developing sustainable extension programs.

Methods: Descriptive-survey method of research was employed in this study.

Result: Findings revealed that the coastal villagers were male-dominated, mostly adults and married, elementary graduates and composed of four members in every household. The dominant dialect spoken was Ilocano and Roman Catholicism was the predominant religion. They mostly rely on fishing, mud crab and crablets catching as their main occupations, with most respondents using crab pots as their fishing gear. Some respondents violated fishing regulations by using active gear like filter nets. Mud crabs and river mullets are the primary catches, with river mullet being a particularly vulnerable species in the region. The average monthly income is₱7,396 which is below the poverty threshold. Despite low income, there are respondents reported borrowing an average of ₱21,142.86 from lending companies or banks, primarily for investment in fishing equipment. Most respondents rely on portable pumps for water and dispose of waste primarily through burning, with limited access to formal waste management services. Over half of the motorized boat owners did not register their boats. Most respondents live in single-type houses, with permanent wall construction, permanent roofing and cement floor material. Training and financial literacy programs, enhancing education and skill development, promoting sustainable fishing practices and introducing boat registration and subsidy programs and providing health and welfare support to empower the community and improve their livelihoods and well-being.

Key words: Coastal areas, Communities, Environment protection, Livelihood, Profiling.

INTRODUCTION

Agriculture plays a key role in economic growth to the rural population in both developed and developing countries (Ababu *et al.,* 2021). In particular, coastal communities are often dependent on marine and aquatic resources for their livelihoods (Kanaga *et al.,* 2025), which makes their socioeconomic well-being closely tied to the health of their environment. High population pressure in the coastal areas has led to the conversion of many mangrove areas to other uses, including infrastructure, aquaculture, rice and salt production and other human activities (Ballad and Mangabat, 2021).

The municipality of Buguey, Cagayan comprised of thirteen coastal barangays in which agriculture dominates the municipal economy. About 80% of the municipality engaged in farming, fishing and related activities (Local Government of Unit of Buguey, undated). Coastal villagers in areas like Buguey, Cagayan, rely on fishing, farming and other natural resource-based activities as primary sources of income.

As such, the need for targeted, sustainable extension programs that can help coastal villagers adapt to these challenges is critical. These programs should be grounded in the specific needs and characteristics of the community, which can be effectively assessed through a detailed examination of their socioeconomic profile. Understanding the socioeconomic profile of coastal villagers is essential for designing effective, context-specific development programs that can improve their livelihoods while promoting environmental sustainability.

The study assessed the socioeconomic profile of coastal villagers in Buguey, Cagayan, with the goal of providing valuable inputs for the development of sustainable extension programs. By focusing on key aspects such as income generation, access to resources and community resilience, this research will contribute to the formulation of policies and programs that can help improve the quality of life for coastal villagers while ensuring the sustainable use of their natural resources.

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MATERIALS AND METHODS

The study was conducted in 2024 by Cagayan State University in the coastal barangays of Buguey, Cagayan, Philippines. Purposive sampling techniques were adopted because the respondents of this study were the coastal villagers of the study area. The descriptive-survey method of research was used in this study. There were 137 coastal villagers who interviewed to elicit information on their socio-economic status such as sex, age, household size, relationship status, dialect, religion, educational status, income and its sources, water source, waste management, borrowed money, fishing gears owned, species caught, fishing boat ownership and registration, housing and its facilities and tools and equipment ownership in farming. The questionnaires were distributed personally to the respondents by the researchers. Researchers assisted the respondents in answering the questionnaires by translating some questions in their dialect. The collected data were tabulated for analysis. Descriptive statistics such as frequency counts, percentage rank and weighted mean were computed and analyzed.

RESULTS AND DISCUSSION

Demographic and social profile of the coastal villagers

Socio-demographic profiles of respondents is shown in Table 1. Of the 137 respondents, the data revealed a significant gender disparity in the coastal communities of Buguey, Cagayan. Men comprised the majority (95.62%) with 131 male respondents, while only 6 women respondents (4.38%) were recorded. This predominance of males is strongly associated with the main occupation in the area-fishing and related activities-fields that are largely male-dominated and highlights the gender-specific division of labor present in this community. Cultural norms and traditions that go unchallenged continue to foster male-centric discussions within the fisheries sector in the Philippines. As reported, men make up 90% of the workforce in fisheries (Torell *et al.,* 2021). Of those involved in capture fishing, aquaculture and similar fishing activities, 70% are men (BFAR, 2023).

The majority of respondents fall within the adult age group, followed by seniors and youth. This indicates that the majority of the working population is within the adult age category. Based on data from the Philippine Statistics Authority (PSA, 2019), the highest percentage of employed individuals was found in the 25-34 age brackets, which accounted for 27.3% of the overall workforce. This indicates that these individuals primarily focused on work, while younger individuals are more likely to prioritize education over employment. In Region 02, fisherfolk engaged in various fishing-related jobs tend to be older, such as aquaculture at 55 years old, capture fishing at 50 years old, fish vending at 49 years old, gleaning at 51 years and fish processing at 50 years old (BFAR, 2023).

The most common household size (27.74%) among respondents is 4 members. This distribution suggests that the majority of respondents live in households of 3-4 members, with very few in either significantly smaller or larger households. This distribution indicates that most respondents fall into the small family category, with an average household size of 4.5 members, which aligns closely with the country's 2020 average household size of 4.1 members (PSA, 2022). Impoverished people may have restricted their family size to a medium size due to limited resources (Chandra *et al.,* 2025).

Majority of the respondents (80.29%) are married individuals, while 16.05% are single individuals. The high percentage of married individuals indicates that most respondents are family-oriented, which may also reflect the sense of stability that marriage provides in communities dependent on fishing livelihoods. Cagayan Valley has the highest proportion of married individuals, at 47.6% (PSA, 2023).

The main spoken language in the community is Ilocano (76.64%), while 23.35% speak Tagalog as their dialect.

Table 1: Socio-demographic profiles of respondents.

Parameters	Frequency	Percentage
Sex		
Male	131	95.62%
Female	6	4.38%
Age		
Youth (15-24)	9	6.57%
Adult (25-64)	116	84.67%
Senior (>65)	12	8.75%
Household size		
Small families (1-5)	101	73.72%
Medium families (6-8)	30	2190%
Large families (>8)	6	4.48%
Relationship status		
Married	110	80.29%
Single	22	16.05%
Separated/divorced/annulled	1	0.72%
Widowed	4	2.91%
Dialect		
Ilocano	105	76.64%
Tagalog	32	23.35%
Religion		
Church of christ	2	1.45%
Iglesia ni cristo	2	1.45%
Jehovah's witnesses	14	10.21%
Methodist	7	5.10%
Roman catholic	112	81.75%
Educational status		
Elementary level	44	32.12%
Elementary graduate	15	10.95%
Highschool level	29	21.17%
Highschool graduate	21	15.33%
College level	14	10.22%
College graduate	6	4.38%
Vocational	8	5.84%

This is consistent with regional trends, where Ilocano is the most widely spoken language in several nearby regions, such as Cagayan Valley, Ilocos Region and Cordillera Administrative Region (PSA, 2023).

Roman Catholic is the main religion in the community (81.75%). Philippines boasts to be the only Christian nation in Asia (Mayer, 2023). Of the 108,667,043-household population in 2020, 78.8% reported Roman Catholic as their religious affiliation (PSA, 2023).

About 32.12% respondents in the community have completed only elementary education, followed by high school level (21.17%), which suggests that the general educational attainment in the community is relatively low. This could be attributed to socio-economic factors, where many young individuals prioritize earning money to meet daily needs over continuing their education. This situation is consistent with findings of Bayani *et al.* (2021), who noted that residents of coastal barangays in Gonzaga, Cagayan also had elementary-level education. A similar pattern was observed in various coastal villages of Cagayan as reported by Ballad and Mangabat (2021). Meanwhile, individuals who have reached at least the college or vocational education, or have obtained a college degree, tend to have a greater chance of obtaining stable, higher-paying jobs, allowing them to contribute more significantly to their families' financial well-being.

Economic profile of the coastal community

It is shown in Table 2 that the majority of respondents are classified as skilled agricultural, forestry and fishery workers, as defined by the Philippine Standard Occupational Classification (PSA, 2019). This classification is reflective of the fact that most respondents rely heavily on fishing, as well as the catching of mud crabs and crablets, as their main occupations and sources of income. These main occupations of the community are related to their geographical location, along Buguey Lagoon and coastal areas, which leads into works related to their location. As to age and gender, adult men dominated fishing activities in the community. This indicates that men serve as the main providers for their families, with fishing being their primary means of earning a living. The dominance of men in this sector reflects traditional gender roles, where cultural norms and societal expectations have long positioned men as the main financial supporters in the Philippine fisheries industry. According to DOLE, 90% of those employed in fisheries are men (Harris and Vincent, 2015). Men are good at fishing because they are physically strong, natural leaders, self-powered and action oriented (Ferrer *et al.,* 2017). Other respondents contribute to their family's income through various economic activities, including skilled trades, elementary occupations and service and sales roles. This distribution of occupations indicates that, because of a lack of advanced educational qualifications, many individuals engage in work that is geographically and locally oriented-such as fishing and roles within the barangay-along with labor-intensive jobs like carpentry and other daily wage occupations.

The average daily income of the community is ₱238.58, which reflects the earnings of households engaged in fishing, mudcrab and crablets catching and other economic activities. The majority of this income is derived from fishing, as the community's location offers limited opportunities for farming, making fishing the primary source of livelihood. This average income is significantly lower than the ₱420 daily income of agricultural workers in Cagayan Valley, as reported by the Department of Labor and Employment. It indicates that the community's income falls below the expected income levels for households in the region, highlighting the economic challenges faced by these families. These communities were characterized as having low-income households, having monthly income of P7,396. Based on the 2023 Philippine poverty thresholds, income of most respondents is below the poverty threshold of PhP 13,873 monthly (PSA, 2024). This amount which a family of five members should earn to meet food and non-food needs is far higher than the computed average monthly income of the respondents. This implies that fishers in the community are earning just enough to meet their basic household needs. A consistent decline in the poverty rate was experienced by the fisheries sector from 2009-2018 (BFAR, 2023). Fisherfolk is one of the sectors with the highest recorded poverty incidence at 34% in 2015, 38% in 2012, 41% in 2009 and 41% in 2006 (PSA, 2017; PSA, 2020). In 2021, PSA reported an increase in the poverty incidence among fisherfolk, recording a 30.6% rate-the highest among the basic sectors. Both farmers and fisherfolk consistently demonstrated a high poverty rate from 2009 to 2021, which made them the poorest among the basic sectors within the said period (BFAR, 2023).

Majority of the respondents (66.66%) rely on portable pumps as their primary source of water. Across regions in the Philippines, the top three regions with the highest percentage of families with basic service sanitation facilities were Region III-Central Luzon, Region IVA-CALABARZON and Region II-Cagayan Valley (PSA, 2023).

Table 2: Community's source of income.

Occupation classification	Frequency
Skilled agricultural and fishery worker (fisherman, crab catcher and farmer, livestock raiser, fish processor, farmer).	307
Craft worker (carpenter, construction worker, painter).	18
Elementary occupations (laborers, utility worker, tricycle driver).	13
Service and sales worker (store owner, vendor, barangay police officer, barangay chairman, councilor, barangay health worker).	7

Most respondents disposed of their waste by burning, reflecting common waste management practice in the community and highlight a reliance on informal and often environmentally harmful method. In 2020, about 50.7% of the 26.4 million households in the Philippines had their kitchen garbage picked up by garbage trucks (PSA, 2023).

Among the respondents, 21 individuals reported borrowing money from lending companies or banks, with an average loan amount of ₱21,142.86. This suggests that while some households seek external financial assistance, the majority do not rely on borrowing from lending companies and able to cope without taking out loans, even though they encounter financial difficulties from low household incomes. Most of the borrowers (87%) agreed to pay their debt over a six-month period, indicating that a significant portion of their daily income will be dedicated to repaying the loans. The primary purpose of borrowing money is to invest in their livelihoods, particularly purchasing fishing equipment and supplies.

Most respondents reported owning various types of fishing gear, with the crab pot being the most commonly used, employed by 48.7% of respondents for capturing crabs, which serves as their primary source of livelihood. Other fishing gear types used by the respondents include gillnets (27.6%), filter nets (7.0%), hook and line (7.0%), scoop nets (5.5%), cast nets (3.5%) and danish seines (0.5%). Meanwhile, it was observed that some respondents used filter net which is considered as active gear. According to Fisheries Administrative Order (FAO) 201 by DA-BFAR (2000), it prohibits the operation of municipal and commercial fishing boats using active gears in municipal waters, bays and fishery management areas. Some of the respondents (7%) violated the rules and regulation of FAO 201 since they used active gear in capturing fish in marine waters. In the data, there were 0.5% owned danish seine, which is classified as an active fishing gear. The main potential negative impact of this on living resources is when too many small-sized organisms and non-target species are caught and sometimes discarded. The data suggests that most respondents rely on passive fishing methods, which are more sustainable and in compliance with local fishing regulations.

Mud crab is the most common species caught by the community, comprising 29.7% of their catch. Buguey is characterized by its extensive mangrove swamps, where the nursery grounds for the life of mud crabs. Other fish species caught are river mullet (23.6%), river crab (17.6%), rabbit fish (8.8%), pony fish (6.0%), blue swimming crab (3.8%), big eyed scad (2.7%), trevally (2.7%), skip jack tuna (2.2%), anchovy (1.6%) and climbing perch (1.0%). Buguey wetlands cover 80% of Buguey municipality (BirdLife International, 2024), which is one of the most productive aquatic ecosystems in Cagayan Valley having diverse aquatic flora and fauna.

There are 59 individuals (43.07%) owned motorized fishing boats while 45 individuals (32.85%) owned non-motorized fishing boats, with carrying weight capacity of 100-300 kilograms. Among the 59 owners of motorized boat, more than half of them have no registration of their boats. The reported unregistered boats can be result of financial incapability and costly registration fee and documentary requirements considering their daily income which is just enough for their living.

The data showed that gas stove (26.3%) is the common household item of the respondents. Other household items owned by the community are television (24.1%), motorcycle (17.5%), electric fan (15.4%), refrigerator (10.9%), washing machine (5.3%), aircon (0.3%) and bicycle (0.3%).

Characteristics of housing units of coastal villages is illustrated in Table 3. Majority of respondents live in single-type houses, while 3.65 % of the respondents reside in duplex houses. This distribution highlights a strong preference on single houses compared to duplex may be due to factors like affordability, maintenance ease and space considerations. In 2020, majority of families in the country lived in a single type of building (PSA, 2021).

Most of the respondents have permanent walls and permanent roofing in their houses. This indicates a clear

Table 3: Characteristics of housing units of coastal villages.

Characteristics of housing unit	Frequency	Percentage
House/Building type		
Single-type	132	96.35%
Duplex	5	3.65%
Construction materials of outer walls		
Permanent walls	82	59.85%
Mixed but permanent walls	30	21.90%
Light construction wall	18	13.14%
Mixed but predominantly light materials	7	5.11%
Construction materials of roof		
Permanent roof	86	62.77%
Mixed but permanent roof	24	17.52%
Mixed but light construction roof	26	18.98%
Light construction roof	1	0.73%
Floor material type		
Cement floor	110	80.29%
Mosaic	20	14.60%
Wood floor	4	2.92%
Arena	3	2.19%
Number of bedrooms		
One	77	56.20%
Two	51	37.23%
Three	7	5.11%
Four	1	0.73%
Five	1	0.73%
House amenities*		
Kitchen	134	97.81%
Living room	117	85.40%
Comfort room	102	74.45%
Septic system	2	1.46%

Note: *Multiple responses.

preference on permanent wall and roofing construction among the respondents. PSA (2021) noted that Filipino houses were generally made of strong materials and majority of the families had galvanized iron. Meanwhile, the most common flooring material of respondents' houses is cement floor.

In terms of the number of bedrooms in the housing unit, 56.20% respondents have one bedroom in their housing units. Almost all housing units of respondents have kitchen (97.81%), living room (85.40%) and comfort room (74.45%), while there are only 1.46% have septic system. About 84.0% of the families had basic sanitation service level or used an improved sanitation facility that is not shared with another household (PSA, 2022).

Three respondents (2.19%) owned irrigation pump and also three respondents who owned hand tractor. Irrigation pump and hand tractor are two farm equipment owned by the few respondents, who have the capability to buy this farming equipment.

CONCLUSION

In conclusion, majority of respondents in Buguey, Cagayan, predominantly male, Ilocano-speaking, belong to small, family-oriented households and low educational attainment. Most are relying on fishing, particularly mud crab catching, as their primary but low-income livelihood, resulting in most living below the poverty line and relying on loans, despite owning motorized boats and generally adequate housing with varied water sources and inadequate sanitation for some.

Recommendations are strengthening fisheries and agriculture livelihoods through capability building, financial literacy and sustainable fishing gear regulation policy.

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Disclaimers

The views and conclusions expressed in this article are solely those of the authors and do not necessarily represent the views of their affiliated institutions. The authors are responsible for the accuracy and completeness of the information provided, but do not accept any liability for any direct or indirect losses resulting from the use of this content.

Conflict of interest

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