

Socio-Economic Dynamics, Institutional Exclusion, and Value Chain Vulnerabilities of Small-Scale Riverine Fishers along the Pulangi River

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ABSTRACT

The growing involvement of women in the educational sector has immensely benefited the academic labor force; nevertheless, coping with professional and personal aspects remains a major issue for women. Women academics act in multiple capacities as teachers, researchers, administrators, mentors, accreditors, and governance within the institution while undertaking family and social duties. The research seeks to analyze the factors that affect work-life balance of women employees at educational institutions in Gujarat state. Based on Role Conflict Theory, Spillover Theory, Conservation of Resources Theory, and Social Exchange Theory, the research aims at studying the effect of occupational stress, workload, family duties, and organizational support on work-life balance. Descriptive research approach was used, and primary data were gathered from 268 women educators working in schools, colleges, and universities using a structured questionnaire. The reliability test revealed satisfactory internal consistency (Cronbach's $\alpha=0.74$), while descriptive analysis, correlation analysis, and factor analysis were used to investigate the relationship between the study variables. The results show that 41.5% of participants could not afford sufficient quality time with their families because of work responsibilities, 39.6% of them experienced exhaustion and emotional distress at work, and 37.7% of them had no enough time for their own well-being. It is further found out that overworking and work stress have negative effects on the work-life balance, but organizational support, flexibility in work schedule, counselling services, and welfare facilities have positive effects on employee well-being and job satisfaction.

Keywords: Work-Life Balance; Women Educators; Occupational Stress; Organizational Support; Job Satisfaction; Employee Well-Being

INTRODUCTION

Inland capture fisheries along major river systems in the Philippines serve as a vital lifeline for rural household food security, local market supply, and rural livelihoods (PSA, 2020; WorldFish, 2012). The Pulangi River, one of the most prominent river basins in Mindanao, supports communities that depend heavily on indigenous freshwater species for daily sustenance and economic survival (Corpuz, et.al. 2025; Radaza et al., 2026). Despite the socio-ecological significance of small-scale inland fisheries, producers face complex structural challenges, including complete institutional isolation, financial exclusion, and asymmetric market structures that severely limit their earning potential and resource resilience (Wageningen UR, 2012; WorldFish, 2012).

Small-scale riverine fishers operate within informal supply chains where access to modern harvesting technologies, formal extension services, and post-harvest storage infrastructure is nearly nonexistent (Tadifa et al., 2024; Wageningen UR, 2012). Consequently, fishers often bear the full financial burden of operational inputs while remaining price-takers in a market dominated by localized retail monopolies (WorldFish, 2012).

Understanding the socio-demographic baseline, operational dynamics, post-harvest practices, and value chain dynamics of riverine fisheries is essential for formulating targeted policy interventions, sustainable resource management frameworks, and rural development strategies (Corpuz, et.al. 2025; Tadifa et al., 2024). This study presents a comprehensive empirical profile of the inland capture fishery along the Pulangi River basin. By assessing socio-demographic indicators, harvesting processes, quality management constraints, market logistics, and institutional support mechanisms, this paper identifies core value chain bottlenecks and provides actionable strategies to enhance fisher livelihoods, promote cold chain infrastructure, and foster institutional integration.

METHODOLOGY**Research Design and Study Location**

This study utilized a quantitative descriptive research design. The investigation was conducted in riparian fishing communities situated along the Pulangi River (Figure 1), a primary freshwater river system providing critical livelihood support to local households.

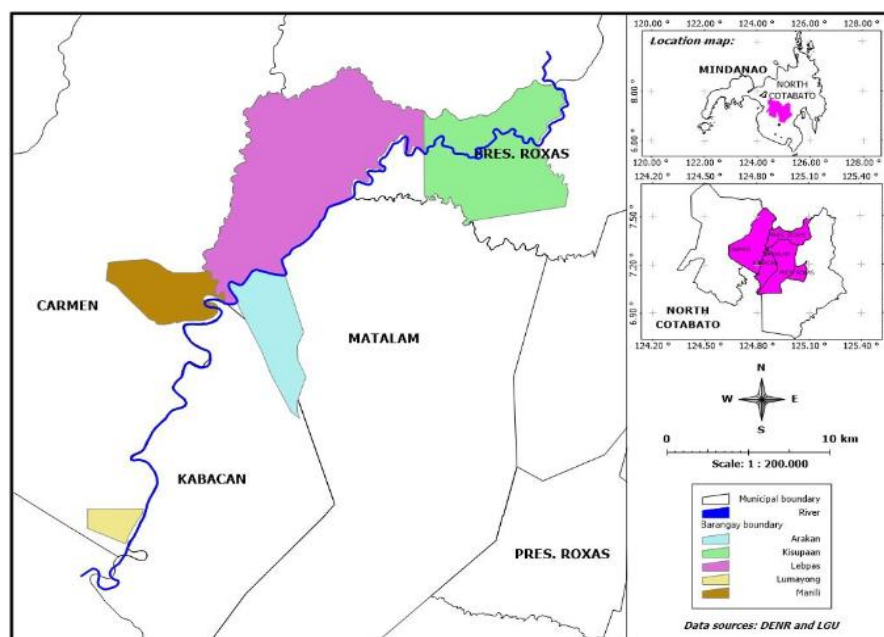


Figure 1. Location of the study

Population and Sampling Strategy

The population comprised active small-scale freshwater fishers operating within the study site. A purposive sampling strategy was employed, obtaining a total sample size of $n = 36$ active fisherfolk household heads.

Data Collection Instrument

Data were gathered using a structured survey questionnaire divided into five key sections:

Section A: Socio-Economic Profile: Age, sex, marital status, education level, household size, primary and secondary economic activities, land tenure, and organizational affiliations.

Section B: Capture Mechanics & Peak Performance: Gear utilization, motorized boat ownership, peak season volume sold (kg), unit prices (PHP), perceived market demand, and revenue metrics.

Section C: Extension Services & Financing: Access to technical training, gear fabrication methods, formal/informal credit sources, loan history, and government project awareness.

Section D: Quality, Grading & Storage: Cold storage availability, buyer quality specifications, quality intervention needs, and grading criteria (size, weight, disease, cleanliness, physical injury).

Section E: Marketing, Logistics & Labor: Sales channels (farm gate, local/regional markets), buyer types (collectors, households, retailers), price determination power, market information access, modes/ownership of transport, cost-sharing practices, and labor sourcing.

Section F: Peak Season Market Analysis, Transport and Labor: Peak Season — Where Sold (multiple response), Usual Buyers (multiple response), Average Quantity Sold (kg), Average Price Sold At (PHP), Demand Explanation, Main Mode of Transport to Market (free response), Ownership of Means of Transport (free response), Description of Commodity Transport Costs, Shares Transport Cost with Others, Transport Means Appropriate for the Captured Fish, Main Source of Labor for Fishing Activities

Data Processing and Analysis

Survey data were coded, analyzed using standard descriptive statistics:

Categorical Data: Summary via frequencies (n) and percentages (%) for variables such as educational attainment, sales outlets, transport mode, credit sources, and price-setting entities.

Continuous Numeric Data: Evaluation using measures of central tendency and dispersion (means, minimums, maximums) for age, fishing experience, peak season volume (kg), and peak season revenue (PHP).

Multiple Response Analysis: Aggregation for non-mutually exclusive survey questions (e.g., peak season sales location, buyer categories, and buyer selection factors).

RESULTS AND DISCUSSION

Socio-Demographics & Livelihood Profile

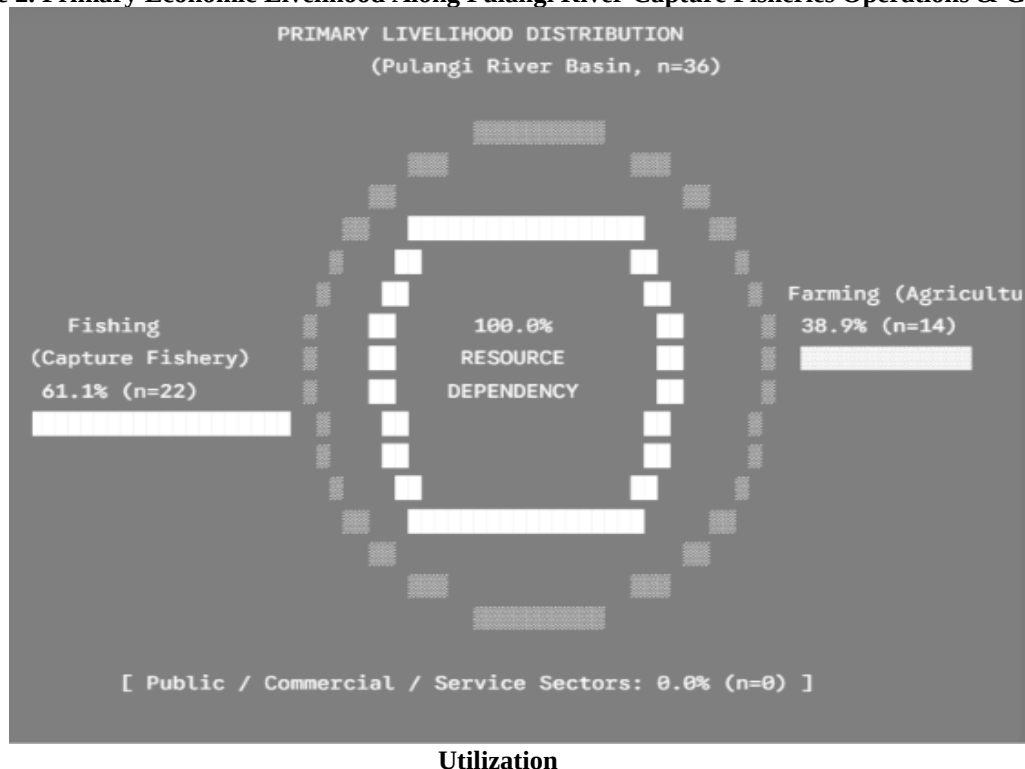
Demographic Structure

The surveyed cohort comprises a highly homogeneous demographic profile ($n = 36$). All male, married head of family with adult cohort ranging from 25 to 50 years old (Mean age = 41.1 years). The basic educational attainment predominates. 83.3% have completed Junior High School or lower, while only 16.7% ($n = 6$) achieved tertiary-level education.

Primary Economic Livelihoods

Community economic activity is strictly confined to primary natural resource production along the Pulangi River basin such as fishing (Capture Fishery) with primary income source of 61.1%, farming (Agriculture) with primary income source of 38.9%, and sectoral diversity of 0.0% engagement in public sector employment, formal trading, or commercial service sectors (Figure 2).

Figure 2. Primary Economic Livelihood Along Pulangi River Capture Fisheries Operations & Gear



The operational profile of the surveyed fishers ($n = 29$) reflects a highly direct, self-reliant, and experienced labor structure. All respondents (100.0%) engage exclusively in primary resource harvesting and collection, with an absolute absence (0.0%) of on-site processing, post-capture sorting, or specialized field transport processing. This individualistic operational mode is mirrored in the labor organization, where 100.0% of fishers operate as single-operator units without any reliance (0.0%) on family labor, hired workers, or external crews. Furthermore, the respondent group possesses substantial sector-specific experience, averaging 14.1 years in fishing operations. In terms of equipment and technology (Figure 3a), the fleet displays universal motorized mobility, with 100.0% ($n = 29$) utilizing motorized watercraft equipped with engines. Harvesting gear is characterized by a universal reliance on fishing nets (100.0%), complemented closely by hook-and-line configurations featuring hooks and bait (96.6%). To support extended and low-light operations, there is high adoption of auxiliary equipment, specifically general accessories (89.7%) and battery units (86.2%) used primarily for navigational lighting and night fishing. Additionally, to offset high commercial input costs, 37.5% of fishers ($n = 12$) engage in DIY gear fabrication, dividing their efforts equally between improvised nets (50.0%) and traps (50.0%). Finally, the primary motivations for harvesting indigenous fish center heavily on dual-purpose socio-economic and food security goals (Figure 3b). Nearly all fishers operate to satisfy direct household subsistence needs (96.6%) while simultaneously generating income through local market sales (96.6%). In contrast, orientation toward broader export markets remains negligible (3.4%, $n = 1$), highlighting that indigenous fishery extraction in the region is predominantly geared toward local dietary fulfillment and immediate livelihood sustenance rather than industrial or international supply chains.

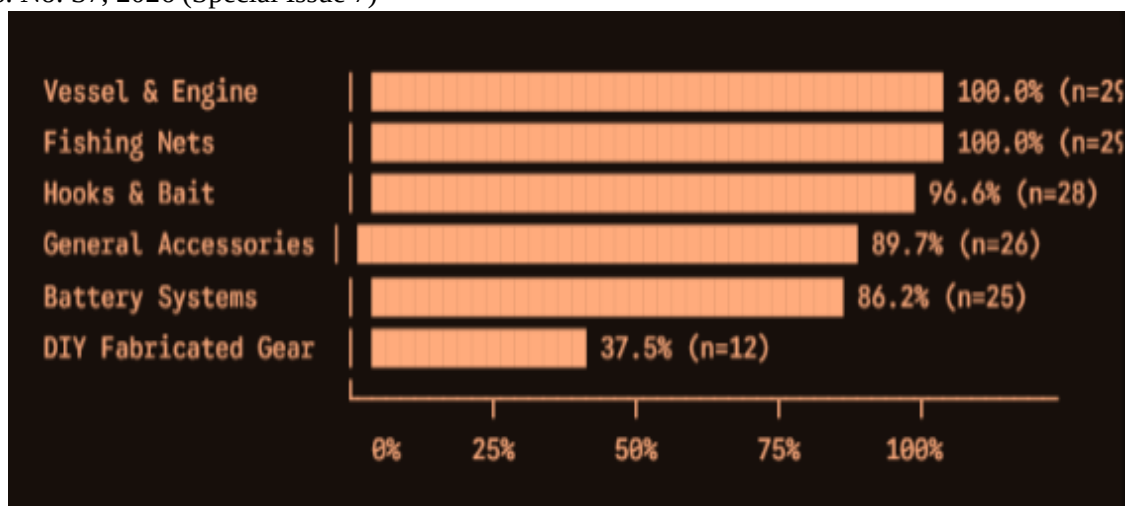


Figure 3a: Equipment & Auxiliary Technology Adoption Rate (%)

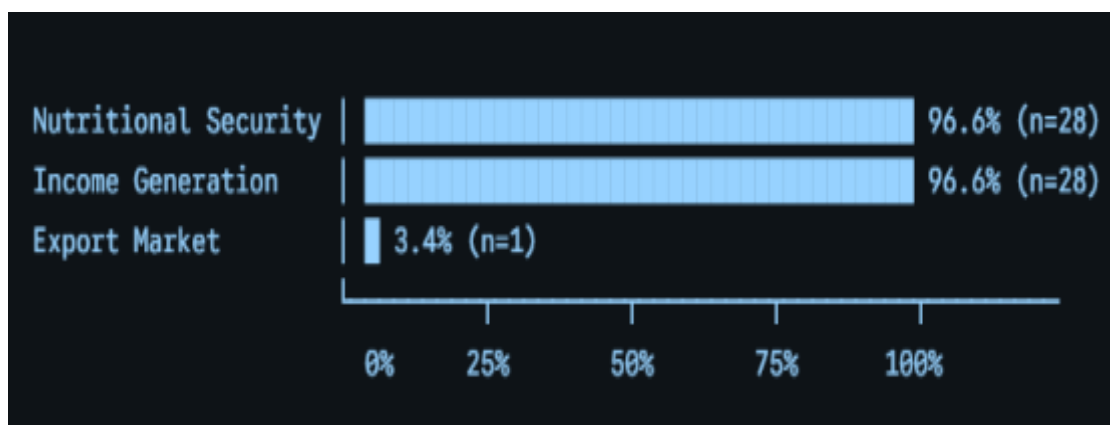


Figure 3b: Primary Motivations for Harvesting Indigenous Species (%)

Extension Services & Financing

Access to technical training, gear fabrication methods, formal/informal credit sources, loan history, and government project awareness.

The multi-panel graphs (Figure 4) illustrate significant resource constraints, complete financial exclusion, and a prominent information gap among the surveyed producers. Most respondents (59.4%) report that key production inputs are not accessible. Financial infrastructure appears entirely absent, as 100.0% lack access to financial services, resulting in total reliance on personal savings as their sole source of credit (100.0%), without any utilization of formal banking or micro-finance facilities. Moreover, there is an absolute lack of awareness regarding institutional support initiatives, with 100.0% indicating no knowledge of relevant projects. Despite these baseline constraints and lack of service penetration, a strong majority of respondents (83.3%) demonstrate high willingness to accept financial support structured as loans. Finally, among the small subset utilizing DIY

materials (n = 6), usage is evenly split between nets (50.0%,) and traps (50.0%,).

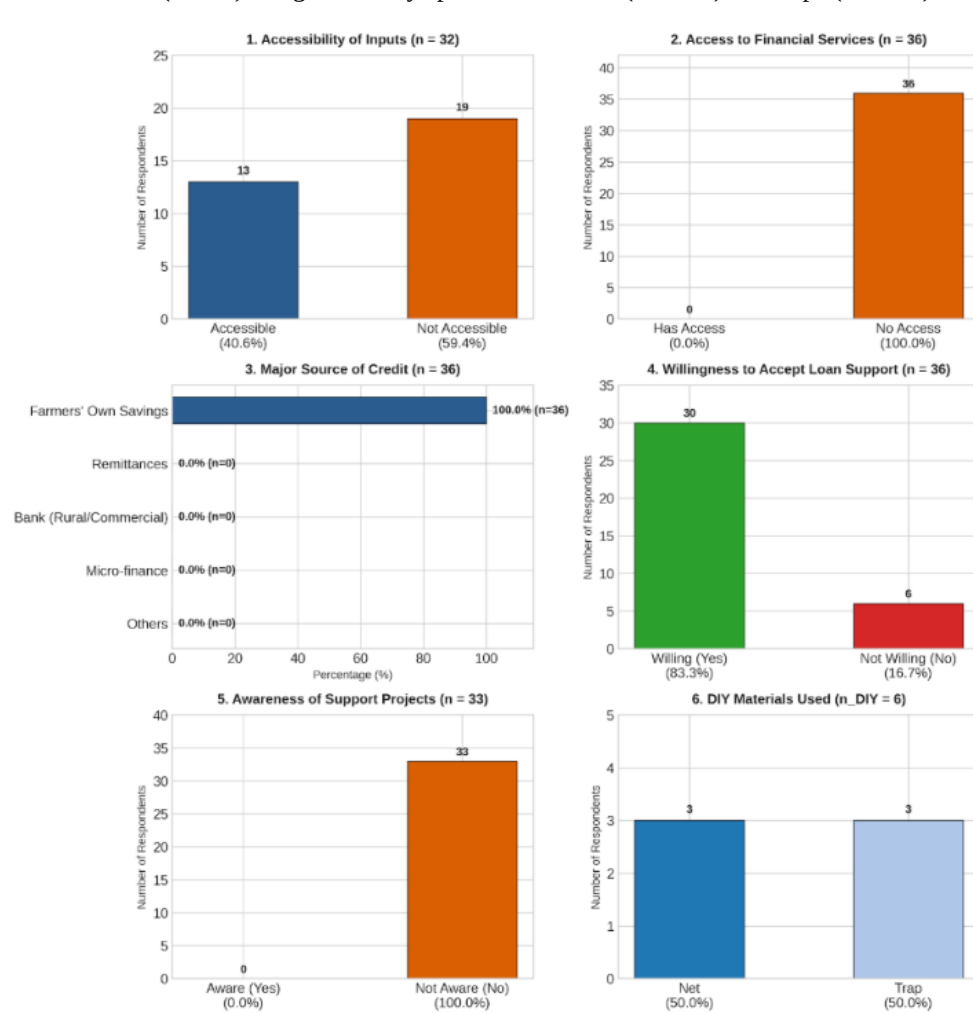


Figure 4. Multi panel graph of the Extension services and financing

The surveyed fishery along the Pulangi River basin represents an experienced, self-reliant, but socio-economically vulnerable producer group. While fishers maintain functional equipment, motorization, and informal peer-cooperative networks, their expansion is constrained by a severe institutional vacuum, absence of cold chain infrastructure, and absolute market price-taking.

Quality Management, Grading & Post-Harvest Storage

Table 1 presents the Quality Management, Grading Parameters, and Post-Harvest Preservation Profile. The Buyer Quality Expectations & Interventions reported that Quality Gap of 91.7% state their catch fails to meet buyer quality attributes. The required intervention of 100.0% identifies quality enhancement as the single core requirement to command better market prices. The specification standards of the retailers unilaterally dictate quality parameters and technical specifications for 100.0% of respondents.

The Grading Parameters & Financial Impact reveal a cost addition of 100.0% report that sorting/grading introduces additional handling costs. The Grading Criteria used strictly physical and quantitative Product Size (100.0%) and Product Weight (100.0%). The Grading Criteria omitted the biological, sanitary, or physical damage factors (Pest/disease damage, cleanliness, injury, shape, color, and maturity) are unmonitored (0.0%). While Market Orientation of 100.0% do not incorporate buyer quality requirements into pre-harvest or harvest production practices.

The Cold Storage & Preservation reported the Storage Capacity of 0.0% possess cold storage facilities, holding tanks, or post-harvest preservation equipment. While Sale Timing is 100.0% unload their catch immediately post-harvest to avoid spoilage.

Table 1. Quality Management, Grading Parameters, and Post-Harvest Preservation Profile

Category Indicator /	Specific Metric / Finding	Sample Size (n)	Percentage (%)	Primary Operational Implication
1. Buyer Quality Expectations	Catch Fails Buyer Quality Attributes	33	91.7%	Widespread post-harvest quality mismatch
	Quality Enhancement Required for Better Price	33	100.0%	Universal core requirement to improve margins
	Technical Specifications Set by Retailers	36	100.0%	Complete retailer market dominance
2. Grading Parameters & Impact	Sorting/Grading Adds Extra Handling Cost	29	100.0%	Incurs mandatory operational expenses
	Grading Used: Product Size & Weight	29	100.0%	Strictly physical and quantitative sorting
	Grading Omitted: Sanitary/Injury/Maturity	29	0.0%	Qualitative & health factors ignored
	Market Orientation in Production Practices	29	0.0%	Zero pre-harvest adaptation for buyers
3. Cold Storage & Preservation	Cold Storage / Preservation Access	36	0.0%	Total absence of cold chain infrastructure
	Immediate Catch Sale Post-Harvest	33	100.0%	Immediate offloading to prevent spoilage

Market Value Chain & Logistics

The Market Access & Price Determination in Table 2 reported that Buyer Access of 88.0% (n = 22) experience no difficulty securing buyers. The Decision Factors for Buyer Selections' Primary determinants are Transport Availability (100.0%) and Price Offered (100.0%). Secondary drivers include proximity (19.4%), scale fairness (16.7%), and buyer loyalty (16.7%). The Price Dynamics is Monopsonistic market arrangement with 100.0% of fishers report that Retailers set market prices and the Information Asymmetry is 100.0% operate without access to formal market information or price tracking systems.

Table 2. Market Access, Buyer Selection Determinants, and Price Determination Dynamics

Market Dimension	Specific Indicator / Parameter	Sample Size (n)	Percentage (%)	Primary Value Chain Implication
1. Buyer Access & Demand	Faces No Difficulty Securing Buyers	22	88.0%	Strong local market demand absorption
	Experiences Difficulty in Securing Buyers	3	12.0%	Minor market entry/access barrier
2. Buyer Selection Criteria\ (Multiple Response)	Transport Availability	36	100.0%	Primary logistical driver
	Offered Price	36	100.0%	Primary economic driver
	Distance Proximity	7	19.4%	Secondary geographical driver
	Scale / Weighing Fairness	6	16.7%	Secondary operational driver
	Buyer Loyalty / Regularity	6	16.7%	Secondary relational driver
3. Price Control Dynamics	Retailer-Set Prices (Monopsony)	36	100.0%	Total price-taking position; zero leverage
	Fisher-Set or Negotiated Prices	0	0.0%	Absence of producer pricing power
4. Market Intelligence	Access to Formal Market Info / Tracking	0	0.0%	Absolute information asymmetry

The Peak Season Characteristics in Table 3 reveal a Metrics & Demand with 100.0% sell in kilogram and report High Demand. The volume of catch is 16.0 kg/fisher (fixed batch baseline), yielding a mean gross revenue of

PHP 3,218.20 (Range: PHP 250 – PHP 4,000). The Primary Outlets of Farmgate Sales: 90.9%, Local/Community Markets: 18.2%, and Regional Markets of 3.0%. Usual Buyers such as Collectors/Aggregators dominate at farmgate (90.9%), followed by direct household sales (48.5%). Zero sales go to institutional buyers, processors, or exporters (0.0%).

Table 3. Peak Season Catch Metrics, Economic Yields, Market Outlets, and Buyer Types.

Market Parameter	Specific Indicator / Option	Sample (n)	Percentage / Metric Value	Primary Value Chain Implication
1. Sales Unit & Demand	Standard Sales Unit	33	100.0% (Kilogram)	Standardized weight-based trade
	Perceived Market Demand Level	33	100.0% (High Demand)	Strong local market absorption
2. Volume & Revenue Yields	Mean Catch Volume per Batch	—	16.0 kg/fisher	Baseline batch harvest level
	Mean Gross Revenue	—	PHP 3,218.20	Range: PHP 250 – PHP 4,000
3. Distribution Outlets\ (Multiple Response)	Farmgate Sales	30	90.9%	Primary direct offloading venue
	Local / Community Markets	6	18.2%	Secondary direct consumer outlet
	Regional Markets	1	3.0%	Minimal broader market reach
4. Usual Buyer Types\ (Multiple Response)	Collectors / Aggregators	30	90.9%	Dominant farmgate intermediary
	Direct Household Consumers	16	48.5%	Local subsistence & retail market
	Institutions / Processors / Exporters	0	0.0%	Complete absence of formal channels

The Commodity Transport Infrastructure such as Logistics Mode was 100.0% transport daily catch using personally owned motorcycles. The Cost Perception & Appropriateness (100.0%) consider motorcycles appropriate and rate transport costs as affordable. The Peer Cooperation of 87.9% pool transit expenses with fellow fishers to maintain low operational costs (Table 4).

Table 1. Peak Season Catch Metrics, Economic Yields, Market Outlets, and Buyer Types (n = 33)

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CONCLUSION

The empirical findings of this study delineate an experienced, self-reliant, but socio-economically vulnerable producer community operating within the small-scale capture fishery along the Pulangi River basin. While fishers exhibit functional operational capacity—characterized by high rates of vessel motorization, localized gear adaptations, and informal peer cost-sharing networks—their long-term economic mobility and resource sustainability are severely constrained by structural bottlenecks across the value chain:

1. **Institutional Void and Lack of Support:** Fishers experience total institutional isolation, evidenced by a complete absence of public or non-governmental extension services, technical fisheries training, and formal cooperative representation.
2. **Post-Harvest Deficits and Quality Misalignment:** An overwhelming 91.7% of producers acknowledge that their catch fails to align with buyer quality preferences. The total absence of cold chain infrastructure forces immediate farmgate sales, preventing value-addition, quality preservation, and price negotiation.
3. **Monopsonistic Value Chain and Asymmetric Information:** Local market dynamics are strictly retailer-dominated. Retailers unilaterally dictate price-setting and technical quality specifications, while fishers operate in complete market information darkness without access to formal price-tracking channels.
4. **Financial Exclusion and Development Readiness:** Producers operate under total formal financial exclusion, self-funding capital expenses exclusively through household savings and reliance on private commercial input dealers. However, an overwhelming 83.3% demonstrate readiness to participate in formal credit and microfinance interventions.

Despite these vulnerabilities, the high degree of operational experience and existing peer collaboration indicate significant latent potential for targeted policy, infrastructure, and organizational interventions along the river basin.

Recommendations

To address these structural vulnerabilities and enhance the socio-economic resilience of riverine fishing households along the Pulangi River, the following actionable recommendations are proposed:

1. **Institutional Integration and Cooperative Formation**
 - **Form Local Associations:** The Bureau of Fisheries and Aquatic Resources (BFAR) and relevant Local Government Units (LGUs) should actively organize and register fishers into formal fisherfolk associations or cooperative units.
 - **Collective Bargaining:** Formal organization will enable collective purchasing of inputs (reducing operational costs) and establish unified bargaining leverage against local retail monopsonies.
2. **Post-Harvest Infrastructure and Cold Chain Development**
 - **Establish Cold Storage Facilities:** Local governments should invest in community-level landing facilities equipped with solar-powered ice machines or insulated storage equipment to eliminate post-harvest spoilage.
 - **Technical Quality Capacity Building:** Implement extension training modules on hygienic fish handling, field preservation, and sorting techniques to help producers meet buyer quality expectations and command higher farmgate prices.
3. **Targeted Financial Inclusion and Credit Access**
 - **Deploy Tailored Microfinance Facilities:** Capitalize on the community's high readiness (83.3%) by introducing low-interest, formal microcredit facilities tailored for inland small-scale fishers to fund gear upgrades and maintenance.
 - **Input Assistance Programs:** Provide subsidized fishing supplies and safety equipment through government assistance programs to reduce reliance on high-cost private dealers.
4. **Market Information Systems (MIS) Deployment**
 - **Real-Time Price Tracking:** Establish localized, SMS- or mobile-based market price information systems to provide producers with real-time visibility into regional price trends, reducing information asymmetry and improving price negotiation leverage.
5. **Co-Management and Sustainable Resource Frameworks**
 - **Inland Fishery Co-Management:** Engage organized fisherfolk in riverine co-management frameworks to enforce sustainable gear regulations, protect indigenous fish species, and ensure long-term ecosystem health along the Pulangi River basin

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REFERENCES

1. Béné, C., Arthur, R., Norbury, H., Allison, E. H., Beveridge, M., Bush, S., ... & Thilsted, S. H. (2016). Contribution of fisheries and aquaculture to food security and poverty reduction: assessing the current evidence. *World Development*, 79, 177-196.
2. Corpuz, Onofre S; Zainudin T. Genso, Esmael L. Abas; Husna T. Lumapenet; Judy Rose C. Alamada; Lyrie Anne P. Gabini; Majerah S. Salik; Janell P. Loquere; Datuali M. Akmad; Onofre Jaame S. Corpuz; Raiza M. Usop, Fatimah C. Dilangalen (2025). Inland fish diversity and conservation challenges in Pulangi River, Central Mindanao, Philippines. *Annual Research & Review in Biology*, 40(4), 82–95.
3. Food and Agriculture Organization (FAO). (2020). *The State of World Fisheries and Aquaculture 2020: Sustainability in Action*. Rome: FAO.
4. Muallil, R. N., Mamauag, S. S., Cabral, R. B., Celeste-Dizon, E. O., & Aliño, P. M. (2014). Catch trends in Philippine small-scale fisheries: Short-term gain, long-term loss. *PLoS ONE*, 9(4), e94760.
5. Pomeroy, R., Ferrer, A. J., & Moore, C. (2017). The challenges of livelihood diversification in coastal communities in the Philippines. *Marine Policy*, 81, 350-357.
6. Philippine Statistics Authority [PSA]. (2020). Fisheries statistics of the Philippines. PSA Government Portal.
7. Radaza, M., et al. (2026). Prioritization of indigenous crops and fish species among residents along the Pulangi River in Mindanao, Philippines. *International Journal of Agricultural and Inland Marine Logistics*, 12(2), 104–115. SvedbergOpen / Injoere Source.
8. Tadifa, G. C., Banicod, R. J. S., Peralta, D. M., Ramos, C. A. M., & Montojo, U. M. (2024). A study on postharvest losses in fisheries owing to changes in market supply and demand in the Philippines. *The Philippine Journal of Fisheries*, 31(1). NFRDI Official PDF.
9. Wageningen UR. (2012). *The Philippine seafood sector: A value chain analysis*. Centre for the Promotion of Imports from Developing Countries (CBI). FAO Sustainable Food Value Chains Library.
10. WorldFish. (2012). *Towards sustainable development of small-scale fisheries in the Philippines: A value chain perspective*. WorldFish Center Digital Archive.
11. WorldFish. (2018). *Sustaining Inland Fisheries for Food Security and Nutrition in Developing Nations*. WorldFish Policy Brief, Penang, Malaysia