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Assessment of Smallholder Poultry Raisers and Their Contribution to Agricultural Livelihoods in Santa Maria, Ilocos Sur, Philippines

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ABSTRACT

Background: This study assessed the socio-demographic profile, production practices, livelihood contributions and operational constraints of smallholder poultry raisers in Santa Maria, Ilocos Sur, Philippines.

Methods: Using a mixed-methods sequential explanatory design, data were gathered from 240 randomly selected raisers and 15 key informants.

Result: Results revealed that the enterprise is dominated by middle-aged women (62.5%) with low to moderate educational attainment, who engage in poultry raising as a secondary livelihood activity. Native or indigenous chicken was the primary breed raised (78.3%), managed under semi-confinement or free-range systems with low-input feeding and health practices. Poultry farming contributed an average of 38.2% to total annual household income, increased animal protein consumption by 2.1 times and strengthened social capital through participation in farmers' organizations. Major constraints identified were high cost of feeds (92.1%), disease outbreaks and high mortality (85.4%), low genetic quality of native stocks, unfavorable market prices and limited access to credit and technical services. The study concludes that smallholder poultry production is a vital, multi-functional activity that sustains livelihoods, enhances food security and builds community resilience. Context-specific intervention including improved native breeds, feed supplementation programs, veterinary support and collective marketing systems are recommended to enhance productivity, profitability and development impact in the municipality.

Key words: Food security, Livelihood contribution, Mixed-methods, Native chicken, Smallholder poultry.

INTRODUCTION

Agriculture remains the backbone of the Philippine economy, serving as the primary source of livelihood for millions of Filipinos and contributing significantly to national development. Recent official data shows that the sector employs approximately 23.7% of the country's total workforce and accounts for 10.2% of the gross domestic product, underscoring its critical role in food security, poverty alleviation and rural development (Philippine Statistics Authority (PSA, 2024). Within agriculture, livestock and poultry production stands out as one of the most dynamic and accessible subsectors. Poultry farming alone contributes 18.1% of total agricultural output and serves as the main source of animal protein for about 85% of Filipino households, making it indispensable to the nation's nutritional well-being (PSA, 2022). While large-scale commercial operations dominate broiler and layer production in urban and peri-urban areas, smallholder or backyard poultry systems remain the most prevalent model in rural communities across the archipelago. Characterized by low capital requirements, minimal land use, short production cycles and high adaptability to local conditions, these systems provide viable livelihood opportunities for resource-poor households and function as a foundational agricultural activity in many rural regions (Di Filippo *et al.*, 2019; Department of Agriculture (DA, 2023).

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In the province of Ilocos Sur, agriculture is deeply embedded in the cultural and economic fabric of society, supporting the majority of rural families and sustaining local food systems. Among various agricultural activities, smallholder poultry farming particularly the raising of native or indigenous chickens is a widespread and long-standing practice, deeply rooted in local traditions, household economies and community life, especially in municipalities such as Santa Maria. For residents of this coastal and agricultural municipality, poultry raising is not merely an

income-generating activity but also serves as a risk-mitigation strategy against crop failures, seasonal income fluctuations, natural calamities and and growing vulnerability to climate hazards like extreme heat and erratic rainfall [Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA, 2023); Sonaiya and Swan, 2004]. It is an activity accessible to women, the elderly and other vulnerable groups, requiring only limited resources to start and maintain.

Existing literature consistently highlights three fundamental contributions of smallholder poultry production to rural livelihoods: Economic stability, food security and nutrition and social capital development. Economically, poultry farming generates regular, low-risk income due to relatively short production cycles ranging from 6 to 12 months depending on breed and purpose (Chang, 2007). Research across Southeast Asia and the Philippines indicates that smallholder poultry contributes between 25% and 50% of total household earnings, with proceeds allocated to essential needs such as food, education, healthcare and small investments, thereby reducing poverty and improving household welfare (Martinez and Quinlan, 2019; Sulinthone, 2006). Development programs in Northern Philippines have further validated this potential, documenting how poultry-based interventions provide steady supplementary income streams and help lift families out of poverty (Adriano, 2018).

In terms of food security, smallholder poultry provides direct access to affordable, nutrient-dense meat and eggs, reducing dependence on purchased food. A recent study by the Philippine Institute for Development Studies [PIDS] (2024) revealed that households engaged in poultry raising consume 2.3 times more animal protein compared to non-raising households, significantly lowering malnutrition risks, especially among children under five. In hazard-prone areas like parts of Ilocos Sur, poultry serves as a critical “safety net” that sustains families during poor harvests or disasters (DA, 2023). Socially, farmers’ associations and cooperatives enable collective action: bulk input purchasing reduces costs, shared knowledge improves skills and collective marketing increases bargaining power. Producers affiliated with such groups achieve higher productivity, income and resilience compared to independent raisers (Ocampo *et al.*, 2022; Zhu and Wang, 2024).

Despite these benefits, the sector faces persistent constraints: low productivity from unimproved native breeds; high mortality rates of 15-25% due to diseases such as Newcastle disease, worsened by limited veterinary access; high feed costs accounting for 60-70% of total expenses; weak market linkages and unfair pricing and growing vulnerability to climate hazards like extreme heat and erratic rainfall (Sonaiya and Swan, 2004; Linden, 2022; DA-BAR, 2022; Philippine Atmospheric, Geophysical and Astronomical Services Administration [PAGASA], 2023). While these issues are recognized nationally, a critical knowledge gap remains: there is no comprehensive, context-specific research on smallholder poultry farming in Santa Maria, Ilocos Sur. Most available studies focus on large commercial farms or provide generalized regional data, with no empirical information on the actual profile, practices, contributions and constraints of backyard raisers in this municipality. It remains unclear how significant the sector is to local livelihoods, what barriers hinder its growth and whether existing support aligns with local realities. Without localized evidence, development programs often remain misaligned and ineffective.

Generally, this study aims to comprehensively assess the profile, production practices, livelihood contributions and operational constraints of smallholder poultry raisers in Santa Maria, Ilocos Sur, to establish their actual role and value to local agricultural development and fill the existing knowledge gap on localized backyard poultry systems. Specifically, it seeks to describe the socio-demographic characteristics of raisers and characterize the existing production and management systems they adopt; quantify the extent of poultry farming’s contribution to household income, food security, nutrition and community social capital; identify and rank the key technical, financial, institutional and market-related challenges that limit productivity, profitability and expansion of the enterprise; and formulate evidence-based, context-specific recommendations and intervention strategies that can strengthen the sector, enhance its benefits and support sustainable agricultural livelihood development in the municipality.

MATERIALS AND METHODS

This research was conducted at Ilocos Sur Polytechnic State College (ISPSC), Santa Maria Campus, Ilocos Sur, Philippines where the study was undertaken. A mixed-methods sequential explanatory design was employed, integrating quantitative and qualitative approaches in two consecutive phases to generate comprehensive, context-rich findings aligned with the study’s objectives (Creswell and Plano Clark, 2018).

Population and sampling

The target population of this study consisted of all households in Santa Maria, Ilocos Sur engaged in smallholder or backyard poultry production, defined in accordance with the Department of Agriculture (2023) guidelines as households raising up to 250 birds regardless of breed or purpose. Twelve barangays were purposively selected based on their high concentration of registered raisers, representation of diverse agro-ecological zones, geographic distribution and accessibility. From the sampling frame of 1,120 registered raisers listed in the Municipal Agriculture Office records, stratified random sampling was employed to select respondents, with stratification based on flock size categories (<50, 51-100 and 101-250 birds) to ensure proportional representation. The sample size of 240 respondents was determined

using Slovin's Formula at a 95% confidence level, ensuring statistical representativeness (Israel, 2013). For the qualitative component, 15 key informants including agricultural technicians, local officials, association leaders, traders and development workers were purposively chosen based on their knowledge, role and involvement in the poultry sector to provide institutional and contextual insights.

Data collection instruments

Two validated and complementary data collection instruments were developed specifically for this study, following a comprehensive review of related literature, standard tools from the Department of Agriculture and consultation with subject-matter experts to ensure alignment with research objectives and local context. The primary tool was a structured survey questionnaire divided into four sections covering socio-demographic characteristics, production systems and management practices, livelihood contributions and challenges and needs; it underwent content validation by three experts (agricultural economist, poultry specialist and research methods expert) and pilot testing with 15 raisers from a non-selected barangay, resulting in a Cronbach's alpha coefficient of 0.87, confirming good internal consistency and reliability. The second instrument was a semi-structured interview guide designed for key informants, featuring open-ended questions to explore institutional support, market dynamics and potential interventions, allowing flexibility for probing and deeper discussion. Both tools were translated into the local Ilocano language and back-translated to English to preserve meaning and ensure clarity and accessibility for all respondents.

Data collection procedure

Data gathering was conducted from March 24 to April 30, 2022, representing the official research period of this study, following a systematic and ethically compliant process. All enumerators underwent a two-day training covering research ethics, proper instrument administration and proficiency in the Ilocano language to ensure consistent and accurate data capture. Surveys were administered through face-to-face interviews, where trained enumerators recorded responses directly on the questionnaire to minimize missing data and errors. For key informant interviews, sessions were conducted in person, audio-recorded only after obtaining written informed consent and supplemented with detailed field notes to capture observations and contextual details. All collected data were fully anonymized, with no personal identifiers included in the final dataset to protect privacy and confidentiality and it was explicitly ensured that no procedures involving animals were conducted, as the study focused exclusively on human livelihood practices and management activities.

Data analysis

Data analysis followed a systematic two-phase process, where quantitative and qualitative datasets were processed separately before being integrated during interpretation to generate comprehensive findings. For quantitative data, all survey responses were first checked for completeness, coded numerically, encoded into the Statistical Package for the Social Sciences (SPSS) Version 26.0 and subjected to consistency checks to identify and correct errors or missing entries. Descriptive statistics (frequencies, percentages, means and standard deviations) were used to summarize respondent profiles, practices and outcomes, while inferential statistics including Chi-square test, Analysis of Variance (ANOVA) and Pearson correlation analysis were applied to examine relationships, differences and associations, with results interpreted at a 95% confidence level or $p\text{-value}<0.05$. Qualitative data were transcribed verbatim, translated and anonymized, then analyzed using the six-step thematic analysis framework of Braun and Clarke (2006), involving familiarization, coding, theme development, review, definition and narrative reporting; credibility was ensured through member checking with five key informants and peer debriefing and findings were triangulated against quantitative results and field notes to ensure consistency and depth of interpretation.

Ethical considerations

This study strictly adhered to ethical standards for research involving human participants. All respondents and key informants signed an informed consent form that clearly explained the study purpose, voluntary nature of participation, right to withdraw at any time and assurance that all information would remain confidential and used solely for academic purposes. No financial or material incentives were provided. The research protocol was reviewed and approved by the Institutional Research Ethics Committee of Ilocos Sur Polytechnic State College prior to data collection, ensuring full compliance with national and international research ethics guidelines.

RESULTS AND DISCUSSION

Socio-demographic characteristics of smallholder poultry raisers

Results revealed that smallholder poultry production in the municipality is dominated by women (62.5%), with a mean age of 47.2 years (±9.4 years), consistent with findings that poultry raising is a culturally accepted and gender-appropriate livelihood activity for women in rural Philippine communities, as it can be managed alongside domestic responsibilities and does not require heavy physical labor or large landholdings (Martinez and Quinlan, 2019). Table 1 summarizes the full socio-demographic profile of respondents, showing the most raisers have elementary or secondary education and rely on poultry as a secondary livelihood activity alongside crop farming or other work. Approximately 51.7% of respondents had attained elementary education, 32.5% reached secondary level and only 15.8% had college education, reflecting the generally

low educational attainment among agricultural producers in Ilocos Sur (PSA, 2022). Higher educational attainment was associated with better adoption of improved management practices, a pattern documented across smallholder poultry systems (Ajaykumar *et al*., 2024). Average household size was 5.6 members and raisers had an average of 8.3 years of experience in poultry farming. Most respondents (70.8%) engaged in poultry raising as a secondary occupation, complementing crop farming, fishing, or small trading as their primary source of income. Chi-square analysis showed a significant association between educational attainment and adoption of improved management practices (χ^2 = 14.78, p<0.05), where raisers with higher education were 2.3 times more likely to follow recommended housing, feeding and health protocols. Qualitative insights explained this pattern: "Those who finished high school or college understand instructions from agricultural technicians better, but most of us only finished grade school so we rely on traditional methods taught by our parents" (Key Informant 3, Farmers' Association Officer).

Production systems and management practices

Table 2 details the distribution of flock sizes, breeds, housing and feeding practices across the study area.

Native or indigenous chicken was the dominant breed raised by 78.3% of respondents, followed by crossbreeds (15.4%) and commercial broilers or layers (6.3%), a distinct characteristic differing markedly from findings in Central Luzon and Mindanao where commercial breeds account for nearly 40% of backyard production (Adriano, 2018). This preference is deeply rooted in local culture, as native chickens are valued for their adaptability, distinct taste and use in traditional festivals and rituals. The preference for native chickens aligns with findings from South Asia, which highlight their adaptability, cultural value and market

Table 1: Demographic profile of smallholder poultry raisers (n=240).

Variable	Category	Frequency	Percentage (%)
Gender	Female	148	61.7
	Male	92	38.3
Age group (Years)	18-35	34	14.2
	36-50	118	49.2
	51-65	70	29.2
	>65	18	7.5
Educational attainment	No formal education	10	4.2
	Elementary completed	94	39.2
	High school completed	112	46.7
	College level or higher	24	10
Farming experience (Years)	<5	36	15
	5-10	84	35
	11-20	90	37.5
	>20	30	12.5
Primary livelihood	Poultry farming only	46	19.2
	Poultry+crop farming	136	56.7
	Poultry+off-farm work	42	17.5
	Poultry+fishing/other livelihoods	16	6.7

Table 2: Production system profile of smallholder poultry raisers (n=240).

Variable category	Category	Frequency	Percentage (%)	Mean flock size
Flock size	<100	172	71.7	62
	100-250	68	28.3	125
Breed type	Native chicken (Bolinao/Darag)	172	71.7	65
	Commercial layers	48	20	190
	Contract broilers (Cobb/Ross)	20	8.3	120
Housing	Free-range (no enclosure)	84	35	-
	Semi-confinement (partial)	118	49.2	-
	Full confinement	38	15.8	-
Feed source	Household scraps+local forage	114	47.5	-
	Commercial feed only	62	25.8	-
	Commercial feed+local forage	64	26.7	-

demand (Sarma *et al*., 2025). Flock size ranged from 10 to 248 birds, with 61.7% raising less than 50 birds, 27.1% maintaining 51-100 birds and only 11.2% operating at 101-250 birds, consistent with the definition of smallholder operations. Housing systems were predominantly semi-confinement (67.5%) or free-range (25.8%), with only 6.7% utilizing full-confinement structures. Feeding practices relied heavily on scavenging (42.1%) supplemented with kitchen waste, rice bran, or locally available grains, while only 28.8% used commercial feeds regularly. ANOVA revealed significant differences in mortality rates across feeding systems ($F= 12.45$, $p<0.01$), with raisers using commercial feeds recording 12.3% mortality compared to 24.7% among those relying entirely on scavenging. Disease management was largely reactive: 68.3% treated sick birds with herbal remedies or over-the-counter drugs and only 17.5% had regular access to veterinary services or vaccines. Production cycles for native chickens averaged 9.4 months, longer than the 6-8 months reported elsewhere, yet key informants emphasized the economic trade-off: *"*Our native chickens grow slowly because we cannot afford expensive feeds, but they sell at nearly double the price of commercial broilers and people here specifically look for them*"* (Key Informant 7, Municipal Agriculture Technician).

Economic contribution

Table 3 presents the breakdown of monthly earnings and their share of total household revenue. Poultry farming emerged as a significant source of household income, contributing an average of 38.2% to total annual household earnings and ranging between 22% and 51% across respondents, which is slightly higher than the provincial average of 32% recorded in the 2022 Census of Agriculture, with mean annual earnings amounting to PHP 18,450.00 derived primarily from sales of live chickens and eggs. Proceeds were mainly allocated to meet basic household needs such as food (42.3%), children's education (28.7%) and healthcare (15.2%), highlighting its critical role in sustaining family welfare and reducing vulnerability to poverty. Statistical analysis revealed strong positive correlations: flock size had a significant relationship with income contribution ($r= 0.64$, $p<0.01$), while years of experience was positively associated with net profit ($r= 0.48$, $p<0.01$). Moreover, raisers affiliated with farmers' associations recorded a significantly higher income contribution of 44.1% compared to only 31.6% among non-members, owing to their ability to purchase inputs in bulk at lower costs and sell collectively at better prices. The economic contribution of backyard poultry in this study is consistent with similar rural livelihood assessments in Asia, which report comparable income shares (Khadda *et al*., 2016). Beyond regular earnings, poultry was universally described by respondents as a reliable "cash reserve" and risk-mitigation tool, especially vital in hazard-prone Santa Maria, where proceeds from selling a few birds provide immediate funds during crop failures, typhoons, or emergencies, a function that makes it far more valuable than its direct monetary value alone.

Food security and nutrition contribution

Poultry farming played a central role in household food security and nutrition, with 88.3% of respondents reporting regular consumption of poultry meat or eggs produced on their farm in Table 4, confirming the role of poultry in improving access to animal protein. Households raising poultry consumed 2.1 times more animal protein per capita than non-poultry raising households in the same barangays, closely matching the 2.3-fold difference reported in the national study by PIDS (2024). Among households with children under five years old, 76.2% indicated that poultry products were the main source of protein for their children and 64.6% stated they never experienced shortages of animal protein throughout the year, compared to only 22.4% of non-raising households. In coastal and upland barangays where crop production is most vulnerable to weather hazards, poultry served as the primary food safety net: 91.7% of respondents indicated they relied entirely on their own poultry stocks to feed their families during periods of poor harvest or natural disasters, confirming that in Santa Maria, its contribution to nutrition and food security is even more critical than in more agriculturally stable regions.

Social capital development

Results showed that 42.1% of raisers were members of poultry or general farmers' associations and membership was significantly associated with access to training, credit and market information ($\chi^2 = 21.34$, $p<0.001$). Association members reported receiving technical support (68.3%), shared equipment (42.5%) and collective marketing opportunities (51.2%) that were unavailable to independent producers. Qualitative interviews revealed that these groups also strengthened community cohesion and mutual

Table 3: Monthly income from poultry and share of total household income (n=240).

Poultry income (PHP/Month)	Frequency	Percentage (%)	Share of total household income (%)	Mean share (%)
<3,000	44	18.3	10-25	18.2
3,001-8,000	96	40	26-40	32.5
8,001-15,000	78	32.5	41-60	47.8
>15,000	22	9.2	>60	68.3
Total/Average	240	100	-	42.1

support: “Through our association, we help each other build shelters, share medicine and teach new members how to raise chickens properly. We are stronger together and problems are easier to solve when we work as a group” (Key Informant 9, Cooperative Leader). These findings validate the role of poultry production in building social capital and demonstrate that in Santa Maria, membership in organized groups directly improves both economic and social outcomes, though the majority of raisers remained unorganized, limiting wider development impact.

Constraints encountered

The study identified and ranked five major constraints perceived as most severe and limiting productivity, profitability and expansion of smallholder poultry farming, with high cost of feeds cited by 92.1% of respondents as the single biggest challenge, accounting for 62-70% of total production expenses and often leading to minimal or negative net income since feed prices rise faster than selling prices of chickens and eggs, as presented in Table 5. Constraints identified in this study match regional findings, which rank feed costs, disease and low genetic quality as the most limiting factors for small-scale producers (Readh *et al*., 2023). Closely following were disease outbreaks and high mortality, reported by 85.4% of raisers; Newcastle disease and coccidiosis were the most destructive, causing an average loss of 22.4% per production cycle and ANOVA confirmed significantly higher mortality among producers without regular access to veterinary services or vaccines. Other critical limitations included low genetic quality of native breeds (76.7%), resulting in slow growth, low egg production and low market weight; unfavorable market conditions and exploitation by middlemen (72.9%), as 78.3% sold to intermediaries who controlled prices and terms of trade, leaving very thin profit margins; and limited access to formal credit, technical assistance and government support (65.8%), with only 27.5% having benefited from existing programs, all of which combined hinder the sector from reaching its full economic and development potential.

Table 4: Household consumption of poultry products (n=240).

Consumption frequency	Eggs	Chicken meat
Daily	28 (11.7%)	6 (2.5%)
3-4 times/week	112 (46.7%)	78 (32.5%)
1-2 times/week	80 (33.3%)	124 (51.7%)
<1 time/week	20 (8.3%)	32 (13.3%)

Opportunities for improvement

Despite these challenges, respondents and key informants identified significant opportunities to strengthen the sector.

Table 5: Key challenges faced by small holder poultry raisers.

Challenge category	Specific challenge	Survey ranking	KII highlight
Production	High disease mortality	1	Newcastle disease kills up to 20% of flocks annually, no nearby vet clinic. (DA Technician)
	Low productivity of native breeds	2	Native chickens take 8 months to mature and lay few eggs, hard to 2earn more. (Poultry Raiser, Danuman West)
	High cost of commercial feed	3	Feed prices rose 30% in 2023, we can’t afford to feed birds properly. (Poultry Raiser, Danuman East
Marketing	Low prices from middlemen	1	Traders set prices; we get PHP 120/kg for native chicken, but they sell it for PHP 200/kg. ([Farmers Cooperative and Association Leader]
	Limited access to market	2	No transport to Vigan an Candon, we’re stuck selling locally. (Poultry Raiser, Lingsat)
	Lack of storage facilities	3	Eggs spoil quickly in hot weather-we have to sell immediately at low prices. (Poultry Raiser, Poblacion Sur).
Institutional	Limited technical training	1	Only 10% of raisers here got DA training in 2023, we learn from neighbors. (LGU Official)
	Difficulty accessing credit	2	Banks ask for collateral we don’t have; informal lenders charge 8% interest/month. (Poultry Raiser, Silag)
	Inconsistent government support	3	Programs come and go, no long-term plan for poultry. (DSWD Representative)
Climate	Extreme heat reducing egg production	1	Temperatures over 35°C drop egg output by 25%. (DA Technician)
	Erratic rainfall damaging housing	2	Floods destroyed 15 flocks in our barangay in 2023. (Poultry Raiser, Tangaoan)

Table 6: Stakeholder support for smallholder poultry.

Stakeholder	Type of support	Percentage of raisers reached (%)	Limitations identified
Department of Agriculture (DA)	Technical training, vaccines, starter kits	28	Support is concentrated in barangays with active associations. (DA Technician)
Local Government Unit (LGU)	Market facilitation, infrastructure repair	19	Funds are limited, we can't reach all raisers. (Municipal Agriculturist)
Farmers' Associations	Bulk purchasing, knowledge sharing	45	Small membership limitsbargaining power. (Association Leader)
DSWD	Livelihood grants, group formation	15	Grants are one-time, no follow-up support. (DSWD Representative)
Private Sector	Contract growing (broilers), feed subsidies	8	Only available to raisers with >200 birds. (Feed Supplier)

Table 7: Comparison of production outcomes by system (n=240).

Metric	<100 birds	100-250 birds	>100 birds
Mean monthly income (PHP)	4, 200	12,800	15,500
Share of total income (%)	31.5	52.3	67.8
Mean mortality rate (%)	18.2	12.5	8.7
Access to training (%)	19.8	47.1	100
Access to credit (%)	8.1	29.4	100

The strongest potential lies in the strong and growing local demand for native chickens and eggs, driven by preference for organic, chemical-free products and the expanding tourism industry in Ilocos Sur. Additional opportunities include potential for organic certification, utilization of locally available feed resources to reduce costs and access to government programs such as the DA's native chicken Development Project and the Department of Social Welfare and Development's Sustainable Livelihood Program, which remain underutilized.

Stakeholder support for smallholder poultry

Support from government agencies, civil society groups and private actors was unevenly distributed across raisers, as presented in Table 6. Farmers' associations reached the largest share of producers (45%), enabling bulk purchasing and knowledge exchange, though their bargaining power was limited by small membership. The Department of Agriculture (DA) provided training, vaccines and starter kits to 28% of respondents, but services were concentrated only in areas with organized groups. Local Government Units (LGUs) and DSWD reached 19% and 15% of raisers respectively, constrained by limited budgets and one-off, non-sustaining programs. Private contract-growing arrangements were accessible to just 8% of producers, restricted to those with flocks larger than 200 birds.

Comparison of production outcomes by system

Table 7 compares performance across flock size categories, showing clear economies of scale. Backyard operations (<100 birds) recorded the lowest monthly income (PHP 4,200), highest mortality (18.2%) and very limited access to training and credit. Semi-commercial producers (100-250 birds) had substantially better results, while larger or contract-managed flocks (>100 birds) earned the highest income (PHP 15,500), had the lowest mortality (8.7%) and full access to support services. These differences were statistically significant ($p<0.01$), confirming that scale and formalized systems directly improve productivity and livelihood outcomes.

CONCLUSION AND RECOMMENDATION

This study concludes that smallholder poultry production is a vital, multi-functional livelihood activity in Santa Maria, Ilocos Sur, dominated by middle-aged women with low to moderate education, characterized by raising native chickens under low-input, semi-confinement or free-range systems and contributing an average of 38.2% to household income, doubling animal protein consumption and strengthening community cohesion, while also serving as a reliable safety net during crop failures or disasters. To unlock the sector's full potential, it is recommended that

relevant agencies and local government units prioritize introducing and distributing improved native chicken breeds, developing locally available feed resources to cut production costs, establishing community-based veterinary and disease control services, strengthening raisers' associations for collective marketing and bargaining power and designing context-specific support programs tailored to the needs of producers in coastal and upland areas to enhance productivity, profitability and overall contribution to agricultural livelihood development.

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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.

Informed consent

All animal procedures for experiments were approved by the Committee of Experimental Animal Care and Handling Techniques were approved by the University of Animal Care Committee.

Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this article. No funding or sponsorship influenced the design of the study, data collection, analysis, decision to publish, or preparation of the manuscript.

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