A Needs Assessment Survey Of Agricultural Production Systems And Practices Among Farmer's Cooperatives And Associations (Fcas) In Ilocos Sur, Philippines

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ABSTRACT
Farmer's Cooperatives and Associations (FCAs) are crucial in consolidating production resources, ensuring easy market access, and promoting better productivity for small farmers particularly in Ilocos Sur characterized by varied agricultural terrains, producing rice, tobacco, vegetables, and high value crops. Despite this significance, there is scarce information concerning production needs, issues, and gaps within FCAs operating in Ilocos Sur. Therefore, the current paper seeks to fill knowledge gaps regarding the agricultural production systems, practices, resource accessibility, training needs, and institutional challenges of farmer cooperatives and associations in Ilocos Sur.
Based on the research question formulated, a needs assessment survey was undertaken to assess the production systems, agricultural practices, resource availability, training requirements, and institutional challenges facing FCAs operating in Ilocos Sur. Data collection entailed administration of structured questionnaires to FCA leaders and representatives, holding ten focus group discussions with the ten selected FCAs, and carrying out key informant interviews with agricultural officers within the province. The quantitative data analysis involved descriptive statistical methods, including frequencies, means, and cross-tabulation. Meanwhile, thematic analysis approach was employed for qualitative data analysis.
It is noteworthy that only 32% of all surveyed FCAs utilize modern and climate smart production technologies such as drip irrigation or organic agricultural practice. The major needs observed included accessing quality seeds and fertilizers (76%), building of post-harvest processing centers (69%), technical trainings on managing crops and value additions to produce (72%), as well as improved linkages with markets and financial institutions (65%). Institutional challenges involved weaknesses in internal governance structure, poor record keeping capacities of the FCA, and ineffective engagement with state organizations.
In conclusion, interventions like provision of technical training to FCA members, construction of relevant infrastructure, and establishment of stronger public-private partnership can facilitate the productivity and sustainability of FCAs in the province. Suggestions include developing a tailor-made support system for FCA, construction of communal post-harvest facilities, and incorporation of digital information services into the agricultural production process.

Keywords: Agricultural production, Farmer's Cooperative and Associations, Smallholder, Climate-resilient, Post-harvest facilities

I. INTRODUCTION

Rationale

Most Philippine agricultural producers consist of smallholder farmers who farm less than three-hectare land, which indicates the presence of an agricultural production system dominated by small and family-operated farms that demonstrate poor agricultural productivity, limited availability of resources, and increased sensitivity to climate-related factors (Agoton, et al., 2024). The existence of Farmers' Cooperatives and Associations (FCAs) is acknowledged in several pieces of national legislation, including the Philippine Cooperative Code of 2008 (Republic Act No. 9520), which recognizes the crucial role of FCAs in addressing agricultural problems due to enhanced collective action, resource pooling, and increased bargaining power. In Ilocos Sur, which is part of the productive Ilocos Region, agriculture remains one of the major means of making a living of many local residents who make up tens of thousands of farmers producing rice, high-value crops, and other agricultural products, contributing to the regional agricultural output and food sufficiency (Bautista, R. E., 2024). Despite the vital importance of FCAs, their

effectiveness in Ilocos Sur still remains constrained by persisting shortcomings in terms of technical capacity, lack of adequate infrastructure, and insufficient institutional support, while the current evidence about the needs of FCAs operating in this province is rather limited (PhilRice, 2022; Juan et al., 2025).

Although there are some existing empirical studies of Philippine Farmers' Cooperatives and Associations, most of them investigate the national or regional aspects of their activity, such as the motives underlying farmers' decision to enter into a FCA and their roles and functions in the markets (Avila, E. C. B., et al., 2025). For instance, Ilar, G. Y., et al. (2021) found that rice-based farmers from Regions 1, 6, and 10 of the Philippines participating in a community-based development project showed better productivity and accumulation of social capital but their findings did not account for regional diversity between different provinces. As Ilocos Sur, being a part of a region that produces both staple and high-value crops (e.g. rice, corn, mango, onion, and vegetable), requires a detailed understanding of specific production systems operating in each of these provinces to formulate appropriate interventions in favor of sustainable agricultural development (Bautista, R. E., 2024). This study attempts to address the identified evidence gap by conducting a comprehensive assessment of FCAs' needs in Ilocos Sur. It is noteworthy that, according to the mission of land grant institutions, such as the University of Nevada, Reno, that includes extension and experiment station programs, the needs of agricultural producers should be identified, and timely assistance provided to increase their productivity and competitiveness (Lande, E., 2025).

This study aims at addressing a particular evidence gap related to the needs of Farmers' Cooperatives and Associations (FCAs) operating in Ilocos Sur by analyzing the characteristics of their activities, current agricultural production systems, needs for resources, trainings, and infrastructure, and institutional constraints to FCA operations. Its contribution to the scientific field will consist in providing policymakers with empirical evidence on how to facilitate the effective operation of FCAs in favor of sustainable agricultural development within the region. These findings may be especially useful for the activities of the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) aimed at developing policies for science-based agricultural planning, research, and development in the Philippines (PCAARRD, 2025).

Significance of the Study

This study has significance to several parties:

1. The outcomes will help provide information about the strengths and weaknesses of FCAs and enable them to take steps that will help improve their production systems, get necessary assistance, and improve members' livelihoods.
2. The outcomes will be important in developing province-wide agricultural programs, allocation of budgets and resources needed for the establishment of post-harvest and irrigation facilities, among others.
3. The findings will aid in developing relevant training modules, technical assistance, and technology transfer strategies based on local production needs.
4. The outcomes will be instrumental in designing projects that are focused on improving governance and market linkages among others of FCAs.
5. This study provides baseline information concerning FCAs' agricultural systems in Ilocos Sur, which has been lacking in the literature about smallholder collective action in Philippine agriculture.

Objectives of the Study

General Objective

The general objective of the research study will be to undertake a needs assessment for agriculture production systems and practices of the FCAs in Ilocos Sur, Philippines, so as to determine key gaps and suggest relevant interventions.

Specific Objectives

1. The specific objectives will include:

1. Understanding the profile of FCAs in Ilocos Sur, which will include the size of the FCAs, organizational structure, major crops grown, and levels of production;
2. Conducting an assessment on agricultural production systems, practices, and technology adoption levels by the FCAs;
3. Identifying key needs in relation to inputs, infrastructure development, and market access; and
4. Analysing the institutional constraints faced by the FCAs' agricultural production activities.

II. Review Of Related Literature

Livestock Production Systems in Farmers' Cooperatives and Associations

The experience of the Bansud Livestock Muli-Purpose Cooperative (BLMC) in Oriental Mindoro demonstrates how livestock cooperatives can adjust production systems even after a severe disruption such as the African Swine Fever outbreak. Having lost most of its hog inventory to the disease, BLMC made strategic adjustments by shifting focus to poultry raising (broilers and layers) using innovative methods such as special housing, biosecurity practices, and raising farmer-producer skills. This case serves as an example of how livestock production systems can be transformed inside cooperatives to ensure livelihood sustainability and food security in communities. This experience is helpful for understanding the need for development of skills, infrastructure, and collaboration with relevant stakeholders as strategies to improve livestock production practices of cooperative members (BLMC, 2024).

A benchmarking study of the livestock, poultry, and dairy (LPD) sectors in the Philippines helps understand the

performance of production systems relative to regional peers. It shows that although commercial hog farms operate more cost-effectively than backyard hog producers, the costs of LPD production in the country are relatively high due to high input costs associated with feed and grower stock. These findings reveal important structural challenges inherent to livestock production in the country that cooperatives and farmer groups should take into account when implementing production adjustments. This literature is useful in the context of needs assessment to understand challenges faced by farmers within national and regional competitiveness of production systems (Briones, R. M. & Espineli, I. B., 2025).
An academic article focusing on livestock industry development in the Philippines highlights the significance of animal agriculture to food security and rural development in the country. Specifically, the article shows that although populations of chickens and pigs have been growing, the number of ruminants (e.g., cattle) has been decreasing. In addition to identifying problems, the author outlines policies and instruments for addressing these challenges as well as discusses industry issues such as feed production and management, animal diseases, and inefficient production techniques. Based on the analysis provided, it is evident that this literature is relevant to understanding challenges and potentials of livestock production systems at a national level, which could help cooperatives assess needs among priority categories of livestock (e.g., swine, poultry, cattle) (Roxas, D. B., 1995).
A study conducted among small farmers in Ilocos Norte introduces the concept of "smart poultry" prototype aimed to help small-scale producers maintain optimal environmental conditions in their poultry houses. Importantly, this research identifies key problems associated with poultry production at small scale, such as disease risk, poor husbandry practices, and a lack of proper monitoring tools, as well as highlights potential benefits that modern innovations can bring to small poultry farmers. Based on the findings, the paper suggests that poultry production at small scale can be an effective tool for increasing the availability of protein in rural households as long as proper environmental control measures are in place. This literature is especially relevant to understanding the challenges facing cooperatives with regard to production practices (Simon, L. F. & Palaoag, T. D., 2024).

Descriptive information about livestock programs in the Philippines provided in official documents by the Department of Agriculture (DA) includes such important initiatives as the Livestock Economic Enterprise Development (LEED), multiplier farm modules for both poultry and livestock farms, livestock genetic improvement programs, and artificial insemination programs. These livestock-related activities reflect the importance of institutional support for livestock enterprises in the Philippines and the ways national agencies strive to promote livestock production through technical and institutional support. Based on these sources, it is clear that this kind of information is valuable in assisting with needs assessments among livestock cooperatives and highlighting areas such as genetics, biosecurity, technical extension, and enterprise development (DA, nd).

Technical notes from the Philippine Statistics Authority (PSA) provide extensive statistics on livestock and poultry production in households and establishments. These notes contain important statistics such as numbers and population of livestock commodities such as cattle, carabao, swine, goats, native and improved chickens, and ducks. This kind of document is invaluable to cooperatives seeking to conduct livestock-related needs assessments in terms of understanding existing production systems and inventory (PSA, 2025)
Industry recognitions given to livestock cooperatives (such as Sorosoro Ibaba Development Cooperative and Batangas Egg Producers Multipurpose Cooperative) in the annual recognition event held by the Department of Agriculture are illustrative of livestock success stories. These recognitions serve as an indication of the contribution made by cooperatives to improving poultry and swine production practices in the country. The industry recognitions discussed in these sources suggest that cooperatives improve their enterprises in a variety of ways, such as promoting feed production, providing livestock management services, and increasing enterprise performance. Although the provided sources are not peer-reviewed articles, they are informative regarding how cooperatives operate (DA-AFID, 2023)
An article on socio-technical systems used in small-scale quail farming in the Philippines sheds some light on the challenges faced by livestock producers such as quail farmers. The article reveals that important barriers to successful innovation and enterprise development among quail raisers include technological, institutional, and social factors. The study makes it clear that innovation in quail farming is hindered by various problems that relate to a lack of coordination in socio-technical systems. The research contributes to the needs assessment process because it suggests that innovation barriers are crucial when assessing any production system (Juan, J. G., 2025).
The effects of cooperative membership on dairy production practices among smallholder carabao farmers in the Leyte Baybay Dairy Cooperative provide useful information on the impact of cooperative membership on livestock enterprises. The study shows that membership in the cooperative positively affects access to credit, use of advanced technologies, and household income compared with non-members. The results indicate that membership in a cooperative can greatly enhance productivity and livelihood in smallholder livestock systems. In particular, a cooperative enables small farmers to benefit from coordinated services (e.g., input provision and production support). The study proves that cooperatives significantly improve smallholders' productivity and livelihood (Annor, S. G., & Delima, G., 2025).
A case study involving the Rosario Livestock and Agriculture Farming Cooperative (TRLAFCO) in Batangas demonstrates how an association of dairy farmers organizes itself into a cooperative to increase the economic value of milk production. The example shows how cooperative members can improve their livelihoods through dairy production. Importantly, this case indicates that livestock cooperatives are able to improve the efficiency of livestock production systems by adding value to traditional products (e.g., milk production and product diversity). Although the provided resource is not a peer-reviewed article, it contains descriptive information relevant to understanding cooperative practices and needs (TRLAFCO, 2025).

The impact of cooperatives on the adoption of production technologies such as feeding of livestock was investigated in the recent PCAARRD study. The study found that membership in a cooperative facilitates adoption of innovation among livestock producers (such as dairy buffalo farmers) by providing members with access to improved technology, inputs, and production knowledge. Importantly, the findings show that cooperative participation enhances individual farmers' bargaining power and increases their ability to reach out to markets and obtain information. Therefore, this research is useful in the context of understanding how cooperatives affect adoption of innovations in swine and poultry systems as well as other types of livestock (DOST-PCAARD, 2019).
Training of farmers' cooperatives and associations (FCAs) to develop skills in cattle production practices, silage-making, and animal health management has recently been conducted by the Department of Agriculture in Cagayan Valley. This intervention illustrates how a national agency addresses FCAs' production needs by organizing training activities. The intervention shows that training FCAs is an efficient strategy to improve livestock production in the region, as cooperatives organize their members and facilitate capacity building. The needs assessment is usually the first step leading to this type of intervention, which means it is an important practice for assessing FCAs' production practices (Reyes, Jr. E. N., 2025).
Finally, national agricultural programs that expand assistance to farmers' cooperatives and associations with respect to livestock enterprises are worth mentioning here. For example, one such initiative involves partnerships between the Department of Agriculture, Development Bank of the Philippines (DBP), and CPF Philippines to provide technical assistance and marketing services for farmers' cooperatives and associations in order to enhance production in the poultry and swine sector. National policies and programs such as this one provide a context for understanding needs of livestock cooperatives and farmers' associations (DA-AFID, 2023).

Comparison to Existing Literature

These results are not unexpected in light of studies conducted on the state of the cooperatives within the Philippines which reveal that limitations in infrastructure and poor uptake of new technology limit the effectiveness of agricultural cooperatives and smallholder groups, where collective action is known to provide better access to resources when coupled with good organizational and governance structures (Ramizo, A. G., et al., 2024).
Local conditions in Ilocos Sur influence the difficulties faced by FCAs through their reliance on the tobacco plant as an essential source of income, exposing farmers to regulations, input standards, and other market considerations different from those involving staple crops, alongside the topographic diversity of Ilocos Sur in terms of coastal plains and uplands resulting in differential access to irrigation systems and exposure to climatic events. Such observations are aligned with other agricultural data from Ilocos Sur indicating that the province produces staple crops, such as rice and corn, as well as high-quality fruits and vegetables and cash crops like tobacco (DA-SAAD, 2025).
The extremely low use of technological aids in FCA (7.1%) contradicts the general trend in policy-making concerning the push towards agricultural digitalization as a means of agricultural modernization and improved productivity. It is clear that the approach taken in promoting digital agriculture has to be context-specific, considering local education levels, internet coverage, and infrastructure limitations prevalent in rural areas, especially in provinces like Ilocos Sur (DA, 2024).

Methodology

Research Design

A mixed-method research design was employed, whereby the quantitative information relating to the FCA profiles and needs would be integrated with qualitative information on difficulties and contextual factors. The above research design was instrumental in ensuring comprehensive coverage of the issues under study.

Location of the Study

The study was carried out in the Ilocos Sur province of the Philippines in 17 chosen municipalities, based on their agricultural productivity and crop diversity, as well as the presence of FCAs that have been registered: Vigan City, Bantay, Santa, Magsingal, San Vicente, Narvacan, Santa Maria, Cabugao, Sinait, Santa Catalina, Candon City, Burgos, Tagudin, Galimuyod, Lidlidda, Suyo and Cervantes.

Population and Sampling

The target population is all 127 registered agricultural FCAs in Ilocos Sur as per records from the Provincial Cooperative Development Office and Provincial Agriculture Office. Stratified random sampling was used to ensure representation across crop types (rice, tobacco, vegetables, high-value crops) and municipality size. A sample size of 20 FCAs was determined using the Slovin formula (margin of error = 5%, confidence level = 95%. For each FCA, data was collected from 1–2 leaders (chairperson or manager) and 3–5 active member-farmers. Additionally, 10 FCAs were selected for FGDs, and 8 key informants (agriculturist, cooperative development officer, DA extension workers, and local NGO representatives) were interviewed.

Data Collection Tools

To collect quantitative information about FCA characteristics, production methods, resource use, infrastructure utilization, training requirements, and problems, the survey questionnaire contains sections such as: FCA organization (registration, number of members, organizational structure), agricultural production processes (crop types, land preparation, pest control, harvesting techniques), resource availability (seed, fertilizer, credit, irrigation), training and extension services received, and market connection and post-production handling. Focus

Group Discussion (FGD) guide to investigate contextual aspects, common problems, and collective demands. The FGDs took 1.5–2 hours and had 6-8 participants each from an FCA. Key Informant Interview (KII) guide was used to gain insights into provincial agricultural policies, programs, and constraints in developing FCAs.

Procedure for Data Collection
The collaboration between the Provincial Cooperative Development Office and DA-Ilocos Sur was done to acquire the list of FCAs and permission during the pre-fieldwork stage. The research group underwent training in conducting surveys, ethical considerations, and data recording.

Survey questionnaires were administered personally in Filipino or Ilocano. FGDs and KIIs were audio recorded (with participant consent) and transcribed verbatim. Fieldwork data was cross-referenced with official FCA documentation and DA records for verification.

Data Analysis
FCA profiles and requirements were summarized using descriptive statistics (frequencies, means, percentages) and cross-tabulation. Data analysis was carried out using STAR 2014. FGDs and KIIs transcripts were coded and analyzed thematically to uncover prevalent patterns, difficulties, and recommendations.

Considerations for Ethics
The ethics committee of the Ilocos Sur Polytechnic State College approved the study. All participants provided informed consent, and data were kept confidential in compliance with Republic Act No. 10625.

Rating Tool for Validation Criteria
This rating tool is used to evaluate the quality, relevance, and practicality of the Survey Questionnaire and Interview Guide during validation (expert review) and piloting (target respondent evaluation). A uniform 5-point Likert scale is utilized:

5 = Excellent (Complies with all standards; no modifications necessary)
4 = Very Good (Slight problems; minor modifications necessary)
3 = Good (Some weaknesses; moderate modifications necessary)
2 = Fair (Major problems; substantial modifications necessary)
1 = Poor (Fails to meet standards; total modification necessary)

Part 1. Validation Criteria Rating for Expert Reviewers
Instructions: Rate each criterion for both the Survey Questionnaire and Interview Guide. Provide comments to support your rating.

Criterion	Description	Survey Questionnaire Rating	Interview Guide Rating
1. Content Relevance	Questions are relevant to agricultural cooperatives in Ilocos Sur and address the study's objectives.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____
2. Clarity & Understandability	Language is clear, concise, and free of unnecessary jargon; instructions are easy to follow.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____
3. SDG Alignment	Questions capture indicators relevant to SDGs linked to the study (e.g., SDG 1, 2, 8, 13, 15).	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____
4. Cultural & Contextual Sensitivity	Questions respect local farming traditions, languages, and gender dynamics in Ilocos Sur.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____
5. Comprehensiveness	All key topics (cooperative profile, production systems, practices, needs, and challenges) are covered.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____
6. Practicality	Instruments are easy to administer and can be completed within a reasonable timeframe.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 **Comments:** _____

Table 1.Validation Criteria Rating for Expert Reviewers

Validation Summary	Response
Survey Questionnaire Overall Rating	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
Interview Guide Overall Rating	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
General Recommendations for Revisions	_____ _____ _____
Reviewer Name & Affiliation	_____
Date	_____
Overall Validation Rating	
Survey Questionnaire Overall	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
Interview Guide Overall	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1

Part 2. Pilot Testing Criteria for Target Respondents

Instructions: Rate each criterion based on your experience completing the survey or participating in the interview. Provide comments to support your rating.

Table 2. Pilot Testing Criteria for Target Respondents

Criterion	Description	Rating (1–5)
1. Understandability	I could easily understand the questions and instructions.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
2. Relevance	The questions are important to my cooperative's needs and practices.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
3. Time Efficiency	The time taken to complete the survey/interview was reasonable.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
4. Comfort Level	I felt comfortable answering all questions.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
5. Clarity of Language	The words used were easy to follow (or clear in Ilocano).	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
6. Usefulness	I believe the information collected will help improve our cooperative.	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1

Overall Pilot Testing Rating

- Overall Experience: ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 What was the easiest part to complete/answer?

_____

What was the most difficult part, and why?

_____

Any suggestions to improve the survey/interview?

_____

Respondent Role: ☐ Farmer-Member ☐ Cooperative Leader ☐ Extension Worker

Date:

Part 3. Aggregated Rating Summary Form

For research team use to compile results from all reviewers/respondents.

Table 3. Aggregated Rating Summary Form

ASSESSMENT TYPE	AVERAGE RATING (1–5)	KEY STRENGTHS	TOP REVISION PRIORITIES
Expert Validation – Survey	_____		_____
Expert Validation – Interview Guide			
Pilot Testing – Surveys	_____		_____
Pilot Testing – Interviews			
	_____		_____
			_____

Validation Results for Survey Questionnaire and Interview Guide

This results summarizes findings from expert validation (n=5 expert reviewers) and pilot testing (n=18 respondents) of the survey questionnaire and interview guide, using the standardized criteria rating tool (5-point scale: 1=Poor to 5=Excellent).

Part 1. Expert Validation Results

Table 4. Expert Validation Results

Instrument SDG	Content Relevance	Clarity	Alignment	Cultural Sensitivity	Comprehensiveness	Practicality	Overall Average
Survey	4.2	3.8	3.6	4.4	4	4	**4.0**
Interview Guide	4.4	4	3.8	4.2	4.2	3.8	**4.1**

Questionnaire

Strengths Highlighted by Experts. Survey questionnaire highlights local agricultural crops (rice, tobacco, garlic), matches well with the cooperative system of Ilocos Sur, and includes culturally appropriate language for the questionnaires. The interview guide and open-ended questions allow participants to express their views deeply, with a logical flow from production to needs and contributions towards SDGs.

Areas Requiring Revision Suggested by Experts. Survey must clarify technical jargon such as "climate-resilient practices," along with including SDG indicators such as gender-disaggregated data for leadership roles. Interview guide must make abstract questions simpler and include follow-up questions to ensure discussions stay on track within allocated time.

Part 2. Pilot Testing Results

Table 5. Pilot Testing Results

Instrument	Understandability	Relevance	Time Efficiency	Comfort Level	Language Clarity	Usefulness	Overall Average
Survey	3.7	4.1	3.9	4	3.5	4.2	**3.9**
Interview	4	4.3	3.7	4.2	3.8	4.4	**4.1**

Questionnaire Guide

Important Feedback from Respondents. During survey, majority believed that questions were relevant to their cooperative's situation, 60% indicated problems in estimating yield per hectare because of lack of record-keeping system. The Ilocano translation received positive feedback (80% preferred the translation). During interview, although respondents freely expressed their difficulties, they suggested that questions regarding the effect of environment gave them a chance to reflect on what they do.

Priorities for Revision by Respondents. Survey – add "Cannot estimate" option for yield estimation questions, change ranking format for needs assessment questions. Interview – rephrasing questions regarding environment, shortening some portions to avoid lengthy interviews.

Part 3. Summary of Aggregated Findings

Table 6. Summary of Aggregated Findings of Expert Validation and Pilot Testing

Assessment Type	Overall Average Rating	Key Strengths	Top Revision Priorities
Expert Validation	4.05	Local relevance, cultural sensitivity	Improve technical term clarity, add concrete SDG indicators
Pilot Testing	4.00	High relevance/ usefulness, strong respondent engagement	Simplify complex questions, adjust format for ease of completion

Both the survey questionnaire and interview guide received "Very Good" overall ratings (4.0–4.1 out of 5). The instruments are aligned with the study's objectives and local context, with minor revisions needed to enhance clarity, practicality, and SDG alignment. After implementing the recommended changes, the tools are ready for full-scale data collection. After validation and pilot testing, the survey questionnaire and interview guide are reliable, user-friendly, and aligned with the study's objectives and SDG priorities. Minor revisions have addressed all identified gaps, and the instruments are now ready for full- scale data collection in Ilocos Sur.

III. Results And Discussion

Table 7. FCA Profile Characteristics

Characteristics	Frequency (n=85)	Percentage (%)
Registration Authority		
Cooperative Development Authority (CDA)	62	72.9
Local Government Unit (LGU)	19	22.4
Other	4	4.7
Membership Size		
<20 members	18	21.2
21-50 members	37	43.5
51-100 members	22	25.9
>100 members	8	9.4
Primary Focus		
Single-purpose (one crop/activity)	49	57.6
Multi-purpose	36	42.4
Primary Crops		
Rice	76	89.4
Tobacco	41	48.2
Vegetables	33	38.8
Fruits/Root Crops	19	22.4
Livestock and Poultry		
Chicken	72	84.7
Duck	14	16.5
Quail	5	5.9
Goat	43	50.6
Pig/Hog	42	49.4
Cow	38	44.7
Carabao	26	30.6
Rabbit	9	10.6
Scale of Production		
Subsistence	12	14.1
Semi-commercial	53	62.4
Commercial	20	23.5
Written Constitution & By-Laws		
Fully implemented	35	41.2
Partially implemented	39	45.9
Not available	11	12.9
Meeting Frequency		
Monthly	28	32.9
Quarterly	36	42.4
Semi-annually/Annually	17	20
Rarely/Never	4	4.7

Most Farmers' Cooperatives and Associations (FCAs) in Ilocos Sur are formally registered with the Cooperative Development Authority (CDA), with 72.9 % of surveyed FCAs holding CDA registration and 43.5 % consisting of 21–50 members, indicating that the cooperative sector in the province is predominantly made up of small to medium-sized collective groups. Rice remains the dominant agricultural enterprise among these FCAs, reflecting its role as the major temporary crop in the Ilocos Region, while tobacco continues to be an important cash crop in the province's farming systems. These patterns are consistent with the broader crop production profile of Ilocos Sur and the Ilocos Region in 2020, where rice was widely cultivated and the province contributed to regional agricultural outputs (DA, 2020). Over half of the FCAs (62.4%) operate at a semi-commercial.

Table 8. Agricultural Production Systems and Technology Adoption

	(n=85)	
Land Preparation Method		
Manual only	15	17.6
Mechanized only	29	34.1
Combination of manual/mechanized	41	48.2
Irrigation Access		
Yes	57	67.1
No	28	32.9
Irrigation Type (among those with access)		
Surface (canal/river)	38	66.7
Groundwater (well/pump)	14	24.6
Drip/sprinkler irrigation	5	8.8
Fertilizer Use		
Organic only	9	10.6
Inorganic only	31	36.5
Combination	42	49.4
None	3	3.5
Pest/Disease Management		
Chemical pesticides	58	68.2
Cultural practices (crop rotation)	45	52.9
Biological control	12	14.1
Resistant varieties	27	31.8
Technology Adoption		
High-yielding varieties	47	55.3
Climate-resilient varieties	22	25.9
Drip/sprinkler irrigation	8	9.4
Post-harvest equipment	15	17.6
Digital tools (weather/markets)	6	7.1
None	19	22.4

While 67.1 % of FCAs report having access to irrigation, most depend primarily on surface water sources (66.7 %), which exposes them to water scarcity during dry spells and droughts. A plurality of FCAs (49.4 %) use a combination of organic and inorganic fertilizers, yet the adoption of climate- smart technologies remains limited: only 25.9 % implement resilient or stress- tolerant varieties that help cope with climate variability, and just 9.4 % utilize more efficient water- use systems such as drip or sprinkler irrigation. Chemical pesticides are the most common method of pest control (68.2 %), indicating a continued reliance on conventional inputs and a need for capacity building in sustainable pest management and climate- adapted practices. These patterns are consistent with broader findings that smallholder farmers frequently underuse climate-resilient varieties, advanced irrigation techniques, and integrated pest management due to limited access to inputs, extension services, and tailored technologies (World Bank & Department of Agriculture (Philippines). (2018).

Table 9. Resource Access and Priority Needs

Access to Quality Seeds		
Always available	12	14.1
Sometimes available	56	65.9
Rarely available	15	17.6
Never available	2	2.4
Access to Credit (past 2 years)		
Yes	39	45.9
No	46	54.1
Reason for No Credit (among non-users)		
Strict requirements/collateral	24	52.2
High interest rates	13	28.3

Lack of awareness	7	15.2
Other **Infrastructure Quality (1=Poor to 5=Excellent; Mean Score)**	2	4.3
Farm-to-market roads	2.3	
Irrigation systems	2.5	
Post-harvest facilities	1.8	
Processing facilities	1.2	
Top 3 Priority Resource Needs		
Quality seeds/planting materials	65	76.5
Post-harvest facilities	59	69.4
Access to credit	52	61.2

While only 14.1 % of FCAs report that quality seeds are "always available," most continue to rely on inconsistent seed supplies, which can constrain productivity and crop performance. More than half of FCAs (54.1 %) have not accessed formal credit in the past two years, with strict borrowing requirements cited as the primary barrier (52.2 %).

Infrastructure conditions are generally weak: post- harvest and processing facilities received the lowest mean scores (1.8 and 1.2, respectively), indicating critical gaps in capacity. These gaps are especially significant given that post- harvest losses remain a major constraint for smallholder agriculture in the Philippines, reducing both the quality and quantity of produce from farm to market and highlighting the need for improved facilities, technology

Table 10. Training Received and Needs

Characteristic	**Frequency (n)**	**Percentage (%)**
Training Received (past 2 years)		
Yes	57	67.1
No	28	32.9
Type of Training Received		
Crop management	42	73.7
Pest/disease control	38	66.7
Post-harvest handling	21	36.8
Financial management	17	29.8
Climate-smart agriculture	12	21.1
Top 3 Training Needs		
Climate adaptation strategies	59	69.4
Post-harvest loss reduction	53	62.4
Product branding/marketing	48	56.5
Preferred Training Format		
In-person workshops/on-farm demos	68	80
Field visits to successful FCAs	52	61.2
Online/webinars	14	16.5

About 67.1 % of FCAs have received training, although content tends to focus on basic crop management and conventional pest control practices. Key training needs identified by FCAs include climate adaptation (69.4 %), post-harvest loss reduction (62.4 %), and marketing strategies (56.5 %), reflecting gaps in areas that are often underprioritized in existing programs. In terms of learning format, most cooperatives prefer in-person workshops (80.0 %) or field visits (61.2 %), emphasizing the value of hands-on, experiential learning approaches for building practical skills among farmers. These patterns align with broader findings that Philippine FCAs often require more targeted, context- specific capacity-building interventions to improve resilience, productivity, and market participation. (PhilRice, 2022; Labios, R. V. et al., 2020)

Table 11. Institutional Challenges and Coordination

Characteristic	**Frequency (n)**	**Percentage (%)**
***Governance Challenges**		
Low member participation	47	55.3

Weak record-keeping	42	49.4
Lack of trained leaders	38	44.7
Coordination Quality (1=Poor to 5=Excellent; Mean Score)		
DA Provincial Office	2.7	
LGU Agricultural Office	2.9	
Private Sector Buyers	1.9	
Financial Management Challenges		
Insufficient capital	51	60
Poor budgeting practices	36	42.4
Lack of financial literacy	32	37.6

Low member participation (55.3 %) and weak record- keeping practices (49.4 %) emerged as major governance issues within FCAs, while insufficient capital (60.0 %) further limits their operational capacity. Additionally, coordination with private sector buyers remains weak (mean = 1.9), indicating a disconnect between producers and formal market channels. These findings align with broader research on agricultural cooperatives in the Philippines, which highlights how governance deficiencies, limited member engagement, and institutional constraints hinder cooperative performance, financial viability, and market integration. Studies show that poor management practices, inadequate capital accumulation, and weak institutional arrangements are key factors that constrain the effectiveness and sustainability of cooperatives in the country (Dimas, B., et al., 2022).

Table 12. Market and Post-Harvest Performance

Characteristic	Frequency (n)	Percentage (%)
Post-Harvest Loss Estimate		
<5%	18	21.2
5-10%	39	45.9
11-20%	22	25.9
>20%	6	7.1
Primary Market Channel		
Local traders	63	74.1
Wholesale markets	28	32.9
FCA-led marketing	15	17.6
Government procurement	12	14.1
Long-Term Buyer Contracts		
Yes	19	22.4
No	66	77.6
Top 3 Market Needs		
Stable market prices	61	71.8
Market information systems	54	63.5

Over 70 % of FCAs in Ilocos Sur primarily sell their products to local traders, while only 22.4 % hold long-term sales contracts, leaving many producers vulnerable to price fluctuations and lack of stable market arrangements. A substantial proportion of FCAs (71.8 %) report post-harvest losses in the range of 5–20 %, largely driven by inadequate drying, storage, and processing facilities issues widely recognized as major constraints for smallholder agriculture in the Philippines due to weak infrastructure and fragmented supply chains. Stable prices and access to reliable market information were identified by FCAs as their highest priorities (71.8 % and 63.5 %, respectively), emphasizing the urgent need for stronger market linkages, value chain integration, and access to broader market channels beyond informal trader networks (Farmout, 2025).

Qualitative Data (FGDs/KIIs)

FGD participants emphasized that inconsistent input supplies often force them to delay planting, while KIIs noted that coordination between DA, CDA, and LGUs is often fragmented, leading to overlapping programs or gaps in support. For example, DA extension services focus on crop production, while CDA prioritizes cooperative governance with little alignment to address FCAs' holistic needs.

FGD participants also highlighted that climate variability like erratic rainfall and prolonged dry spells in upland areas has increased pressure to adopt new practices, but lack of access to affordable climate-resilient seeds and irrigation keeps them reliant on traditional methods. Several groups noted that while training on organic farming

is available, certification costs are prohibitive, making it difficult to access premium markets.
From KIIs, private sector representatives emphasized that FCAs often struggle to meet quality or volume standards required for consistent partnerships pointing to a need for support in grading, standardization, and collective marketing.

Study Limitations

1. The sample focused on registered FCAs, so unregistered groups (which may face greater challenges) were not included.
2. Data was collected from FCA leaders and members, which may not capture perspectives of marginalized groups like women farmers or landless members.
3. Quantitative data on production yields or income was not collected, limiting analysis of how needs translate to performance outcomes.
4. Fieldwork was conducted during a single cropping season, so seasonal variations in challenges or needs were not fully captured.

IV. Conclusion

Based on the findings of the study, the following conclusions were drawn:
1. FCAs are critical to the province's agricultural sector supporting over 40% of the local population through rice, tobacco, and other crops but face significant barriers to growth and sustainability. Most FCAs are small-to-medium, rice/tobacco-focused, with gaps in governance.
2. Most FCAs are semi-commercial production scales, but struggle with weak governance structures, limited access to quality inputs and infrastructure, and low adoption of climate- smart technologies.
3. Priority needs include post-harvest facilities, training in climate adaptation and marketing, and improved access to credit.
4. Institutional gaps such as poor coordination between agencies and low member engagement further hinder FCA performance, while reliance on local traders leaves farmers vulnerable to market volatility.

V. Recommendations

The following are the summarized recommendations based on the conclusions.
1. The findings underscore the need for internal capacity building particularly in governance, record-keeping, and financial planning to better leverage external support. Prioritizing crop diversification (beyond rice and tobacco) could also reduce vulnerability to market or climate shocks. Develop a province-specific FCA governance toolkit and provide targeted training on record-keeping, financial management, and leadership. Mandate regular member meetings and support the full implementation of written by-laws.
2. DA and CDA should align their programs to address both production and institutional needs. For example, linking input subsidies to participation in governance training could strengthen FCA sustainability. LGUs play a critical role in improving local infrastructure like farm-to-market roads and facilitating coordination between FCAs and buyers. Establish seed banks or shared input procurement systems to ensure consistent access to quality seeds and fertilizers. Subsidize climate-smart technologies like drip irrigation, and provide training on sustainable pest management.Upgrade farm-to-market roads to improve access to markets.
3. Investments in post-harvest facilities like shared dryers or storage units, and training on climate adaptation and value addition would directly address top needs. Supporting FCA- led marketing initiatives could also help reduce reliance on middlemen. Build shared post- harvest and processing facilities in high-production areas, with priority given to municipalities with the highest post-harvest losses.
4. The results support calls to revise credit policies for FCAs simplifying requirements or offering collateral-free loans for agricultural inputs and infrastructure. Policies should also prioritize province-specific needs, such as tobacco supply chain improvements for Ilocos Sur. Work with rural banks and government financial institutions to create FCA-specific credit products with flexible terms and lower interest rates. Provide training on financial planning to help FCAs manage loans effectively.
5. Conduct follow-up studies on the assess the impact of interventions implemented based on this study; collect data on production yields and income to measure progress, investigate how FCA benefits are distributed among members particularly women and landless farmers to ensure equitable access, and pilot digital tools for market information or climate monitoring in selected FCAs to evaluate feasibility for rural contexts.

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