

Socio-Economic Factors Influencing the Adoption of Linking Smallholder Farmers to the Market (LinkSFarM) Project by Vegetable Farmers in Malungon, Sarangani

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Abstract—This study examined the socio-economic factors influencing the adoption of the Linking Smallholder Farmers to Markets (LinkSFarM) project among vegetable farmers in Malungon, Sarangani. Specifically, it aimed to assess the farmers' demographic and farm profiles, economic status, marketing practices, awareness and perception of the project, as well as the challenges encountered during its implementation. A mixed-methods approach was employed, combining quantitative and qualitative techniques, with data gathered from 86 farmer beneficiaries from three barangays. Quantitative data were analyzed using tabular presentations to show frequencies, percentages, and rankings, to clearly identify which categories ranked highest or lowest. For the qualitative component, responses were transcribed one by one, with codes for every participant to maintain anonymity. Thematic analysis was then conducted to extract key themes and sub-themes, offering deeper insights into the challenges faced by farmers and their organizations. Combining both methods is crucial, since the quantitative data gives actual evidence of trends and relationships, and the qualitative data provides deeper context and understanding of farmers' perceptions, and experiences. This provides a more comprehensive understanding of the factors that influence adoption of LinkSFarM project. Results show that while the LinkSFarM project provides a promising benefit to the farmer such as increased welfare and income. However, despite the potential benefit of the project, several challenges were encountered during the implementation. These include financial constraints, market access, membership in farmers' organizations, infrastructure, and knowledge gaps. Both quantitative and qualitative findings highlight financial constraints as the most critical challenge faced by farmers and organizations.

Index Terms—Adoption, LinkSFarM, project, vegetable farmers, beneficiaries, marketing.

1. Introduction

Agriculture does not only help in ensuring food security but also serve as the backbone of the economy that stimulates economic activity through job creation and global trade (J, 2024). With the growing population and demand and an expected population growth of 9.6 billion by 2025, farmers need to adopt new strategies to cope up with increasing need of food supply (Nakelse, 2024). However, opposite to what is

expected, farmers are facing challenges globally, such as declining productivity (Lagare, 2021), disconnection from agriculture (Robinson, 2025), and market access (J, 2024).

Nora (2023) highlighted the factors affecting low-agricultural productivity which are low capital investment, lack of coordination between farmers and producers, and being too dependent on manual labor neglecting the use of machinery to increase productivity. Nakelse (2024) emphasized the "Valley of Death" which refers to the gap that hinders the adoption of new methods and systems to help increase the Total Factor Productivity (TFP). According to Fuglie et al. (2024), global agricultural output decreased from 2.72% (2001-2010) to 1.93% (2011 to 2020) significantly impacting food security and agricultural sustainability.

During the height of pandemic, agriculture showed resilience with a 2.1% growth for crops while other sectors are declining (Habito, 2023). However, it is evident that the industry still suffers from low growth in agriculture, which can be attributed to the increase of rural population and declining farm size (Lagare, 2021). When compared to other countries, Philippines has fallen behind in agricultural outputs and shows a slowdown in technological progress concluding that lack of recognition for technology and innovation negatively impacts production (Talavera, 2023). According to Tangonan (2023), this challenge is due to lack of proper communication about technology features which must be provided by researchers to farmers, allowing farmers as end users to appreciate the benefits of using modern technology in agriculture.

While Philippine Social Empowerment and Equity Development Foundation (PhilSEED) (2023), emphasized the top 5 problems most farmers are facing which are capital, post-harvest facility, climate change, market access, and innovation. As noted, many farmers rely on money lenders who charged high interest ranging from 10-20% per month, improper handling of produce which can result to income losses, rising temperatures that damages the crops, lack of capacity of small farmers to connect with bigger market, lack of transportation infrastructure, adoption, dissemination, and implementation of

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modern technology.

Malungon is a landlocked municipality serving as a border of General Santos City and Davao region. In one of its 2024 vision, the emphasis is on becoming a home to dynamic rural communities thriving with farmers transformed into farmer entrepreneurs whose transformation is guided by the sound practices of resource sustainability through improved farming productivity. One of the programs introduced to achieve the vision of Malungon towards its smallholder farmers is the LinkSFarM project. LinkSFarM project aims to help farmers in Malungon to improve their livelihood through enhancing agricultural productivity, managing agricultural production, and integrating farmers in value chain (Cudis, 2019). However, despite the potential benefit of this project, some small farmers in Malungon suffers from challenges while some farmers are hesitant to adopt the LinkSFarM project.

Hence this project aims to understand the impact of LinkSFarM project in the Municipality of Malungon, Sarangani Province and identify the challenges faced in the implementation of the program. The result of the study will be disseminated to all sectors that will benefit from this study including future researchers for further expansion of the study's scope.

2. Review of Related Literature

A. Challenges in Agriculture

Smallholder farmers encounter numerous challenges, which prevent them from exploiting the potential of agriculture. Afrin *et al.* (2022) identified an increased economic burden among smallholder agricultural families in Bangladesh amid COVID-19, due to a lack of access to loans and NGO support. Mayo and Villarta (2023) reported the struggles of corn farmers from South Central Philippines, where outdated way of sowing, susceptibility to natural disasters, and low-price levels from market coupled with lack of support from government have left these farmers depending on personal source of capital. Boughton *et al.* (2023) also explained structural issues such as small and fragmented landholdings, insecure land rights and lack of access to the market as major constraints to the livelihood in rural areas.

Smallholder farmers are pivotal in ensuring food security; however, Singh *et al.* (2024) reported continued experiencing limited resources, technologies, market accessibility, and service tools. These challenges are further exacerbated by demographic expansion, climate change and globalization.

Additional barriers include ageing farmer populations and gender inequality. Satola (2019) observes that ageing smallholder populations that are dominated by old farmers have resulted in shortages of labor that, in turn, call for policy efforts to bring youth into agriculture. In China, numerous workers moved out of agriculture from agriculture and the trend endangers sectoral sustainability (Tong *et al.*, 2024). Older farmers especially, are reluctant in adopting modern technologies due to decreasing physical strength and risk aversion, whereas younger generations, despite having a higher propensity towards adoption of innovation, are less interested

in farming as an occupation (Tong *et al.*, 2024). Contrary, Zhang *et al.* (2025) identified a positive relationship between the aging rural population and the utilization of agricultural socialization services.

In the Philippines, Sabroso and Tamayo (2022) noted that the majority of coffee farmers are below 50 years old but emphasized that aging agricultural personnel is becoming a significant concern. Gender relations further influence farming productivity; Mwalyagile *et al.* (2024) observed male dominance in farming activities as triggered by hierarchical positions in the family structure and access to resources; an observation in line with the report of Orejudos *et al.* (2022) in banana plantation in North Cotabato. Bello *et al.* (2021) found an 11% productivity gap that favored male-managed farms despite equal access to resources, highlighting systemic gender-based inequalities. Likewise, Peralta (2022) observed that most of the women in agriculture play substantial roles in farming and limited roles in decision making.

There are educational gaps which prevent acceptance of technology. Satola (2019) indicated that the majority of farmers do not have even a vocational-secondary education. In China, Ge *et al.* (2023), few farmers in Indonesia obtain college degrees; many are able to complete junior high school (schools in Indonesia include elementary, junior high, and high schools) and in North Cotabato, Philippines, about 50% of farmers did not finish elementary school (Orejudos *et al.*, 2022). Formal training continues to be necessary in order to meet the increasing technical requirements, in spite of practical experience.

Lagasca *et al.* (2024) pointed out that low income, low yields and post-harvest losses constrain many farmers in the country, coupled with poor marketing. Singh *et al.* (2024) underscored the importance of understanding agriculture's direct and indirect poverty alleviation channels such as income, food security and employment.

Hossain *et al.* (2024) pointed out that cash welfare grants and training interventions reduce poverty, and Orejudos *et al.* (2022) identified a link between limited access to credit, and less intensive participation in collective marketing. Farmer organizations have challenges regarding community participation, weak infrastructure, and members' disputes which can retard the effectiveness (Mugwe *et al.*, 2018). Another factor resulting in low returns to collective marketing is small landholdings, which reduce the capability of farmers to participate in collective marketing (Orejudos *et al.*, 2022). Singh *et al.* (2024) found that to alleviate these obstacles, sustainable agricultural practices, value chain development, and targeted policies are required.

These persistent difficulties demonstrate that there are multiple reasons for the struggles of smallholder farmers that may impede their productivity and income increases. Tackling these issues involves more than the adoption of technology, and should be complemented by a policy environment, access to finance, capacity development, and more consolidated farmers organizations. This study looks at the socio-economic determinants affecting the adoption of LinkSFarM project among vegetable producers in Malungon, Sarangani in

identifying barriers to improve the level of participation and as well as the welfare of the farmers.

B. Conventional and Modern Farming Methods

Many households are supported by, and continue to engage in, traditional farming practices which are labour intensive, manual and may be low in productivity and product quality. Given the increasing population and increased food requirements, it has become imperative to shift towards modern farming approaches (Bajpai & Kumar, 2022). Vasant et al. (2024) made comparison between traditional and modern farming in India and found that with the requirement of higher investment in the case of modern farming, it can also compensate with larger scale of operation where it leads to the reduction of units cost and increased yield. Adoption constraints are the lack of familiarity and lack of capacity among those who practice conventional farming. Price floors, subsidies, and crop insurance are all ways that government provides support to farmers in managing some of these risks. While infrastructure development in rural areas is lacking, the government support is very crucial in empowering the farmers to adopt sustainable systems.

In Africa, there is evidence that projects compatible with agricultural development goals have improved farmer welfare (Hossain et al., 2024). Cordonnier et al. (2024) stressed that massive policy and programme responses are important to enhance and revitalize agriculture and to support poor households. The success relies on that technology and human factors work together to provide productivity and resource management (Zhang et al., 2025).

The transformation from traditional agriculture to modern methods of farming is an important progression to address increasing food needs and enhance the standards of living of farmers. Knowledge of the socio-economic factors that determine farmers' acceptance and adoption of these contemporary practices is essential to design successful extension programs. The learning from experiences in the various localities indicates a combined pathway for technology adoption, strengthening of capacities, and policy support—all which are consistent themes also defining how initiatives such as LinkSFarm might enable vegetable farmers in Malungon, Sarangani to become more productive and sustainable.

C. Government Initiatives Supporting Farmers

Tong et al. (2024) analyzed the adaptation strategies pursued by smallholders given the prevalence of socioeconomic and market uncertainties. They discovered a range of strategies from yield maximization with high input use, to strategies that optimize input use for profit and environmental sustainability. Some economic risks remain, however the ongoing recommendation is for tailored interventions that focus on sustainable practice, management of resources and better distribution of information and social support for resilience and productivity.

Colting-Pulumbart et al. (2018) also highlighted that Agro-Enterprise Development (AED) contributes to livelihood developments in the rural areas as it builds different capitals

under the Sustainable Livelihoods Framework but it also involves huge capital investment and time. With growing markets for food and ample rural labor, these changes offer prospects that would benefit from strategic support by government and other organizations. They suggested recording of best practices and impact analysis in order to streamline the role of AEDs in sustainable rural development.

These government-driven initiatives show the importance of an approach tailored to context, the need to support the self-reliance and dignity of smallholder farmers and make them more resilient and to support livelihoods to break the cycle of poverty. The approaches and agro-enterprise development models, as emphasized by Tong et al. (2024) and Colting-Pulumbart et al. (2018) stress the importance of integrated capacity-building, resource management and market access. Frameworks such as these have relevance in the design and success of initiatives like LinkSFarm -- which intend to invigorate and make the farmers of Malungon, Sarangani, more empowered through sustainable agriculture and improved economic opportunities.

D. Agricultural Development and Smallholder Farmers in the Philippines

Singh et al. (2024) added that promoting agriculture and smallholder development through enabling environment is a must for the inclusive growth consistent with the SDGs. Over the years, smallholder farmers have significantly become an important workforce in agriculture in the Philippines contributing to national food security, poverty reduction and rural development (Agaton & Guno, 2024). However, their potential remains largely untapped and faces numerous constraints particularly with respect to access to finance, technology, infrastructure and markets. It is important for the policy makers to formulate and ensure the implementation of policies that give opportunity to such farmers to access better resources, technical input and credit to achieve better productivity and income.

It is also important to note that tackling structural problems, for instance land tenure security, climate resilience, and capacity building, were identified to be essential for sustainable agriculture development. Government interventions such as farmer organizations' strengthening, value chain integration and market linkages can enable smallholders to compete better and achieve self-sufficiency. It is in this context that initiatives like the LinkSFarm projects are undertaking to cut supply chain costs, and promote joint marketing and product development initiatives. Such efforts can only be fully appreciated within the context of achieving national development plans and the encouragement of holistic and participatory approaches to poverty alleviation among smallholders for sustainable rural development.

E. Farmer Organizations: Role in Government Interventions

Farmers' associations provide collective bargaining power, access to inputs, technical support and market access. They are central intermediaries in how government programs work to allocate resources and promote agricultural productivity (Barret

et al., 2017; Birchall, 2003). Farmers' associations offer group bargaining, access to inputs, technical advice and markets. They are central facilitators of how government programs operate in resource allocation and agricultural productivity (Barret et al., 2017; Birchall, 2003). Strengthening these institutions is the key to increasing farmer income and protecting good policy.

Strengthening the collective capacity of farmer groups also generates social capital within groups, which helps in exchanging ideas and peer learning, a factor that is vital in the adoption of new innovations and practices in agriculture. These are very significant spaces where the concerns of farmers are articulated, decisions are made, and politics and policies are shaped and reshaped. Policy initiatives to overcome these challenges and others concerning capacity building, managerial transparency and infrastructure to the farmer groups can make them more effective and sustainable. Through promoting partnership between farmers, the government, the private sector, such organizations play a crucial role in raising community awareness of access to markets, inputs and finance which unlock rural development and poverty reduction.

F. Challenges in the Adoption of Agricultural Programs

Many farmers lack access to the necessary information and training to adopt new agricultural technologies and practices effectively. This knowledge gap can be attributed to inadequate extension services and limited exposure to innovative farming techniques (Rogers, 2003).

Farmers often face challenges in accessing reliable and profitable markets. This is due to factors such as poor infrastructure, lack of market information, and weak bargaining power, which can discourage the adoption of new practices that are perceived to be risky without guaranteed market access (Barrett, 2008).

Limited access to credit and financial resources is a significant barrier. Many smallholder farmers do not have the financial capacity to invest in new technologies, purchase high-quality inputs, or absorb the risks associated with adopting new practices (Feder et al., 1985).

The perceived risk and uncertainty associated with new agricultural technologies can deter adoption. Farmers may be reluctant to change established practices due to fear of potential losses and the variability of outcomes (Koundouri, Nauges, & Tzouvelekas, 2006).

Agricultural interventions aimed at improving productivity and sustainability are crucial for enhancing the livelihoods of farmers, particularly in developing countries. One such initiative is the LinkSFarM Project. Studying the socio-economic factors influencing its adoption is essential for several reasons. Understanding these factors helps identify the barriers and enablers to successful implementation, ensuring that interventions are tailored to the specific needs and conditions of the target communities. It also allows for the design of more effective policies and support mechanisms that can enhance the adoption rates and sustainability of agricultural innovations. By analyzing the socio-demographic and economic characteristics of the farmers, the challenges they

face, and the factors that influence their decision-making, researchers and policymakers can develop targeted strategies that promote inclusive and sustained agricultural development (Roberts & White, 2017).

3. Methodology

The importance of this study stems from its potential to offer valuable insights and contribute to the comprehension of the Socio-Economic Factors influencing the adoption of the LinkSFarM program by vegetable farmers in Malungon, Sarangani Province. By addressing the research questions, this study seeks to produce knowledge that can inform program and policy initiatives, ultimately improving the livelihoods of vegetable farmers.

A mixed-methods research approach combining quantitative and qualitative data gathering and analysis methods was employed, ensuring a comprehensive exploration of the research problems. Mixed methods research is any type of qualitative and quantitative research that involves collecting and analysing data, integrating findings, and drawing inferences with the aim of understanding a research problem from multiple perspectives (Shorten & Smith, 2017).

Combining both methods is crucial, since the quantitative data gives actual evidence of trends and relationships, and the qualitative data provides deeper context and understanding of farmers' perceptions, and experiences. This provides a more comprehensive understanding of the factors that influence adoption of LinkSFarM project, that cannot be achieved by any individual method.

A. Respondents of the Study

The study was conducted in the Municipality of Malungon particularly in Barangay Datal Batong, Datal Bila and Alkikan. Malungon is known for its agricultural production, particularly crops such as corn, coconut, cacao, pineapple, banana, rice, and high-value crops.

The selection of project sites of LinkSFarM Project of the Department of Agrarian Reform (DAR) is based on several criteria such as the presence of organized ARBs and functional ARBOs, 600 willing farmer-participants, common crops production, living in the Agrarian Reform Community (ARC), and willing to take on new markets. Applying these criteria and with validation by the project team, three barangays, namely, Datal Batong, Datal Bila, and Alkikan, were identified as the project areas.

A list of vegetable farmers who have participated in LinkSFarM project in Malungon, Sarangani Province was obtained from the Department of Agrarian Reform Sarangani (DAR) Provincial Office. The LinkSFarM project benefitted 600 vegetable farmers.

4. Results and Discussion

A. Demographic Profile of the Respondents

Table 1 presents the results for the demographic profile of the respondents. In terms of age, majority or 37% of the respondents are 46-60 years old. This indicates that majority of

the respondents are already matured and experienced farmers. This also shows that their farming is not a hindrance in the project adoption. While the lowest percentage is 1% with age range of 18-28 years old, indicating the lack of youth engagement in farming. As cited by Sabroso and Tamayo (2022), Philippines is now facing the challenge of aging farmer population, evidenced by the dominance of older demographics within in the sector (Sabroso & Tamayo, 2022). This is also consistent with the findings of Satola (2019), who revealed an aging population of smallholder farmers in Poland. This implies a problem with sustainability of adoption of LinkSFarm, suggesting to create projects that will encourage the youth to continue the farming and marketing practices.

Table 1
Results on the demographic profile of the respondents

Particulars	Category	Frequency	Percentage
Age	18-28 Years Old	1	1%
	29-38 Years Old	7	8%
	39-48 Years Old	26	30%
	49-60 Years Old	32	37%
	61 and above	20	23%
Gender	Male	49	57%
	Female	37	43%
Marital Status	Single	4	5%
	Married	75	87%
	Widowed	7	8%
	Separated	0	0%
Household Size	1-2	9	10%
	3-4	40	47%
	5-6	29	34%
	7 or more	8	9%
Highest Educational Attainment	Elementary Level	13	15%
	Elementary	37	43%
	Graduate		
	High School	21	24%
	Graduate		
	College Level	9	10%
	College Graduate	6	7%
	Masteral Degree	0	0%
	Doctoral Degree	0	0%
Membership in the organization	Yes	64	74%
	No	22	26%

In terms of gender, majority of the respondents are male with 57%, while female comprised the remaining 43% of the respondents. This is consistent with the study of Mwalyagile et al. (2024) in Tanzania, where a gender difference is evident in the dominance of male in agriculture. This indicates that the dominance of males in farming roles. As highlighted by Peralta (2022), many pacific nations do not formally recognize the role of women in agriculture. The prevalence of men in agricultural activities is due to the physical demands need in farming (Lagasca et al., 2024). This suggests to include both males and females in all government programs & projects. Although, there is only few numbers of female, it should be considered to include and encouraged this demographic for a more gender-inclusive project.

In terms of marital status, majority of the respondents are married comprising 87% of the total sample size. This indicates a strong family dependency where family members rely on the head of the household for decision making and in the provision of needs and income. This suggests emphasizing the need for

government interventions such as LinkSFarm that help farmers in sustaining their livelihood and continue providing for their families.

In terms of household size, the highest number of respondents or 47% have household size of 3-4 members, while 9% have household size of 7 or more. The moderate household size suggests a manageable household where only few people relying on the head, indicating that there is a higher chance for them to adopt the program. While larger household presents a high ratio of dependency, which indicates an economic challenge and a lower chance of taking the risk of adopting a new program unless financial support is provided.

In terms of educational attainment, 43% of the farmers have completed their elementary education. This suggest that any programs and trainings must be simplified and user friendly to fit this demographic. While only 7% have finished their college education, and 0% for masters and doctorate degree. This suggest a gap in formal education specially agricultural knowledge in farming, however, this could mean that majority of the farmers acquired their skills through practical experience. As highlighted by Satola (2019), in his study about the case of Poland, that majority of the farmers have only finished vocational courses or education denoting a lacking of advance training and expertise in the field of business and innovation.

The majority of the farmers or 74% have organizational membership which shows a strong community network that can be used as an advantage to leverage group trainings and collective marketing strategy. While 26% or few of the farmers responded that they do not belong to any organizations which show isolation from information, suggesting a more intensive approach to reach this demographic, provide outreach program that will inform them of the benefits of the program and provide trainings to engage them with government Projects.

B. Farm Profile and Economic Status of Respondents

The data above is the result for the farm profile and economic status of farmers. In terms of years in farming, majority or 49% have been farming for over 21 years. This indicates that most of the farmers have acquired practical skills in farming through experience which may hinder the adoption of new program or hesitant to change since they already established farming methods and practices. While 13% of the respondents are somewhat new to farming. This indicates that farming is mostly dominated by older and more experienced farmer. This also aligns with the result in table 1 which shows that majority of the farmers belong in older age demographic. This is consistent with the study of Sabroso and Tamayo (2022) on coffee farmers, revealing that most of the respondents have been farming all their lives. The aging population of farmers significantly harms the socio-economic and sustainable development especially for developing nations where substantial part of workforce are reliant in agricultural labor (Tong et al., 2024). A targeted approach may be done to train and orient the farmers of the benefit of the LinkSFarm Project, in order to slowly shift their method from conventional to new one. This will also encourage young farmers to engage and

Table 2
Results on the farm profile and economic status of respondents

Particulars	Category	Frequency	Percentage
Years in Farming	Less than 10 Years	11	13%
	11-20 Years	33	38%
	More than 21 Years	42	49%
Tenurial Status	Owner Cultivator	52	60%
	Leaseholder/Renting	34	40%
	Farmworker	0	0%
Farm Size	Less than 1 hectare	47	55%
	1.1 to 3 hectares	34	40%
	3.1 or more	5	6%
Farming System Used	Conventional Farming	75	87%
	Organic Farming	0	0%
	Integrated Farming	11	13%
Water Management	Rainfed	83	97%
	Irrigated	3	3%
Estimated Monthly Income	Less than 10,000	36	42%
	10,000 to 20,000	26	30%
	More than 20,000	24	28%
Other sources of income	Livestock Raising	8	9%
	Fishing	0	0%
	Employment	14	16%
	Small Business	9	10%
	Farmworker	15	17%
	Farming (other crops)	1	1%
	None	39	45%

continue the new farming practices.

For the tenurial status, 60% of the farmers are owner-cultivators, this shows that these farmers have better control of their decision-making to adopt the new program. While majority are owning their own lands, 40% is still a significant number which hinder many farmers to take necessary decision in adopting the projects like of LinkSFarm. While none of the respondents are farm worker, which indicates that all farmers have land that they till themselves and do not solely rely on being a farm worker.

However, even though most respondents are land owners, they own less than a hectare of farms. Limited landholding means limited resources and lower chances of taking risks, which could negatively impact exploring and experimenting with the new program. As emphasized by Orejudos et al. (2022), farmers in North Cotabato with less than a hectare of land with less produce found it easier to sell their products directly to the market by joining an organization's collective marketing. This also shows that farmers belongs in smallholder group.

In terms of farming system, 85% of the farmers are still using the conventional method which shows the limited exposure or access of the farmers to diversified method which are more sustainable and beneficial. While integrated farming is practiced by 13% of the farmers, no one uses organic method of farming, which indeed shows the limited knowledge of farmers regarding sustainable farming method. This suggests to raise awareness campaigns or trainings to motivate farmers about a benefits of sustainable method of farming practices.

Majority or 97% of the respondents are relying on rainfed system which hinders them to reach the maximum of their productivity and crops. While only 3% of the respondents have access to irrigation system. This shows lack of irrigation infrastructure which could negatively impact the adoption of a more productive and sustainable program implementation. With the Philippine climate especially the hot temperature

during summer at SOCCSARGEN, it is important to implement a climate-resilient solutions in the program.

In terms of income level among the respondents, 42% are earning less than ₱10,000 per month, with 30% earning ₱10,000 to ₱20,000, and only 28% earning more than ₱20,000 per month. This shows the low-income level among farmers which could impact their adoption of the program to financial constraint. As emphasized by Lagasca et al. (2024) many farmers are facing the problem of low-income. Government programs LinkSFarm may consider giving financial subsidies to farmers to encourage them to join the program.

In terms of income level among the respondents, 42% are earning less than ₱10,000 per month, with 30% earning ₱10,000 to ₱20,000, and only 28% earning more than ₱20,000 per month. This shows the low-income level of the farmers, which can cause financial constraints in the adoption of government projects. LinkSFarm may consider giving of subsidies to farmers to encourage them to join the program.

The data also shows that 45% of the farmers do not have any source of additional income, which means that their income is solely dependent on the proceeds of their farm. However, 55% of the farmers are exploring other potential income sources such as employment, livestock raising, small business, farmworker, and farming coconut. The same case for Nueva Ecija where majority depends on agriculture as primary source of income (Lagasca et al., 2024). However, being dependent on a single livelihood is risky, especially for farming, with no assurance that the crops will yield income or fail. It is essential to consider intensifying the efforts to promote the LinkSFarm project, as this could help increase the economic status of low-income farmers.

C. Marketing Dynamics and Support Services

Most of the vegetable farmers sell their produce through wholesalers or retailers as the most important agent (rank 1), followed by trader-financiers (rank 2) and institutional buyers

Table 3
Results on the marketing dynamics and support services

Particulars	Category	Frequency	Rank
Mode of Selling	Direct to Consumer	30	4
	Cooperative/ Organizations	30	4
	Wholesale & Retailers	47	1
	Online	0	7
	Trader-Financier	42	2
Type of marketing	Institutional Buyer	34	6
	Advertising	1	2
	Promotions	0	3
	Networking Events	1	2
Challenges in Marketing	Direct Marketing	86	1
	Lack of Access to the market	26	3
	Low prices of produce	76	1
	High Cost of Transportation	43	2
Major Challenges of Vegetable farmers	Lack of information about market prices	5	4
	Climate change	11	5
	Pests & Disease	21	4
	Price Fluctuations	69	1
	Financial Constraints	53	2
	Market/Buyer	22	3
	Poor Infrastructure	1	6
Access to Support Services	Yes	71	1
	No	15	2
From what institutions/agencies	Local Government Unit (LGU)	18	3
	Department of Agrarian Reform (DAR)	67	1
	Department of Agriculture	43	2
Services availed	Trainings	68	1
	Provision of Farm Inputs	32	2
	Financial Support	2	5
	Provision of Farm Machinery and Equipment	9	4
	None	15	3

(rank 3). Sales directly to consumers and via cooperatives or farmer's groups were also common but less frequent (rank 4). Online channels was nonexistent, meaning that access to digital marketing channels was not used by the farmers.

Direct marketing (rank 1) was by far the most common activity, indicating that farmers are more inclined to sell directly to consumers without involving promotion or advertising by third parties. Advertising and networking events were almost never used (rank 2), and promotions were not used at all, displaying they no formal marketing methods.

The primary problem confronting farmers was low prices of agricultural products (rank 1), which is synonymous with their profits. The second biggest constraint (rank 2) was high transport costs, followed by small market size (rank 3). Information gap in market prices was not very severe (rank 4), indicating that farmers in the study area might have certain access to price information but face difficulties in terms of cost and access to the market.

The largest obstacles as a whole was price volatility (rank 1), which is consistent with the marketing issue of low price. Lack of financial resources was also an important problem (rank 2), and also problems in market access or access to buyers (rank 3). Although pests and diseases and climate change were both of moderate concern, poor infrastructure was the least serious challenge reported.

There is a large proportion (71 of 86) of farmers, who reported availment of support services from either the DAR (rank 1), the DA, (rank 2), and LGUs (rank 3). This signals that there is active role of government in promoting farmers.

Trainings were the most frequently received support services (rank 1), indicating an emphasis on capacity building. This was

followed by supply of farm inputs (rank 2), then financial assistance, and supply of farm machinery (ranks 4 and 5, respectively). A few farmers (rank 3) received no assistance, which suggests that service provision or access was inadequate.

Overall, these findings indicate that farmers rely mostly on traditional wholesale markets and direct sale systems, but encounter substantial difficulties from price volatility, and transportation cost. Although government assistance is available, it is offered primarily in the form of training and inputs, not in the form of money or mechanization. These findings highlight that initiatives such as LinkSFarm can play a key role in facilitating market access, price stabilization, and provision of broader support services, which will automatically shape farmers economic returns.

D. Factors that Influence the Adoption of LinkSFarm Project

Table 4
Results on the factors that influence the adoption of LinkSFarm project

Demographic Factors	p-Value	Interpretation
Age	0.344	Not Significant
Gender	0.039	Significant
Marital Status	0.667	Not Significant
Household Size	0.908	Not Significant
Educational Level	0.260	Not Significant

As shown in Table 4, none of the demographic factors studied has a significant effect on adopting the LinkSFarm project, except for gender with p-value=0.039, which is less than the standard threshold 0.05. This also implies that gender indeed make a significant difference between male and female farmers in adopting the project. On the other hand, age, marital status, household size and education level had p-values above

0.05, which implies no association with project adoption. Thus, these variables do not seem to be having any major influence on the participation decision by farmers to join the LinkSFarm program.

The significant influence of gender on participation in the adoption of LinkSFarm project corroborates the literature on gender inequality in agricultural roles and productivity. For example, Mwalyagile et al. (2024) and Orejudos et al. (2022) documented male control over farming activities and productivity differentials in male-managed farms where identical access to resources existed, thereby shedding light on structural gender-based imbalances. This is consistent with the finding that gender is a key determinant in the adoption decision.

Conversely, the absence of impact for other factors, such as age, education level, household size, and marital status, tends to disagree with some previous research. For instance, Satola (2019) and Tong et al. (2024) pointed out that demographic changes in the rural areas, age structure of rural population and education level of the farmers may have an influence on the ability and willingness of farmers to adopt new technologies or practices. Likewise, Orejudos et al. (2022) argued that the size of the household affects collective marketing participation which is related to adoption behaviors. The lack of statistical significance in these variables for this study might imply that other socio-economic or situation/source-related issues are more important in terms of affecting the adoption in adoption of vegetable farmers in Malungon, Sarangani.

E. Awareness and Perception of LinkSFarm Project

Table 5
Results of project adoption

Particulars	Category	Frequency	Percentage
Project Adoption	Yes	34	40%
	No	52	60%

Table 5 presents the result on awareness and perception of LinkSFarm project among farmer respondents. The majority, or 60% of the respondents, have not adopted the LinkSFarm project despite its potential benefits. This highlights the factors that must be addressed that hinder farmer from adopting the LinkSFarm project. In previous results, it is noted that the low income level of the farmers can cause financial constraints in the adoption of government projects, which could be the leading factor that hinders the farmers from adopting the project. Meanwhile, 40% of the respondents have adopted the projects, highlighting the potential for improving the adoption rate through intensifying training and awareness about the project's potential benefits.

A large group of respondents, ranked as top source, cited that they learned about LinkSFarm cooperatives or Agrarian Reform Beneficiary Organizations (ARBO). This highlights the significant role of these networks in raising awareness about the potential benefit of LinkSFarm project information. While, third rank learned about the project from local government sources. This low percentage indicates that local government communication channels are ineffective in delivering the project information to the farmers.

The majority of farmers identified increased income as the primary expected benefit of joining the LinkSFarm Project, ranking it as their top motivation in adopting the project. It is noted in previous results that the majority of the farmers are earning less than ₱10,000 a month, with no other source of income, and have a family of 7 or more which shows have increase in income motivates the adoption of the project. According to Lagasca et al. (2024), that the problem faced by many farmers in the Philippines, is attributed to low income. The LinkSFarm can emphasize how the project can help increase profit through better market access, pricing, and value-added opportunities.

Regarding what hinders the farmers from joining the LinkSFarm project despite its potential benefits, respondents cited Capital or financial constraints as the primary barrier to participating, ranking first among the cited hindrances. Given the low-income levels of the farmers, as shown in prior reports, investing in the project is a risk due to their financial capacity. Hossain et al. (2024) emphasize the need to have access to financial resources like loans or subsidies to help improve socio-economic conditions for poorer farmers. This implies that the LinkSFarm project may consider initiatives that address financial barriers, such as partnering with agencies to provide subsidies, loans, or financial assistance. Additionally, time constraints were ranked fourth among the hindrances. Though it is less of a problem than the economic constraint, this can be considered, and LinkSFarm may consider providing farmers with a more flexible time to participate.

F. Challenges Farmer Organizations Face in Implementing the LINKSFARM Project

This section presents the challenges faced by the farmers organization while implementing the LinkSFarm project. All participants are coded to protect their confidentiality. Major themes and Sub-themes were also generated to present the challenges that needs to be addressed.

G. Major Themes and Sub-Themes of Challenges in Implementing LinkSFarm Project

The following table present the major themes and sub-themes generated that summarizes the challenges faced by organizations in Implementing LinkSFarm project.

H. Major Theme 1. Market Access and Financial Constraints

The first generated theme is on market access and financial constraints. This aligns with the quantitative findings where 79% of the respondents cited capital and financial constraints as the hindrance in not joining the LinkSFarm project. Two major Sub-themes were also generated which are difficulty accessing high-paying markets and lack of capital and financial resources for the organization.

1) Sub-theme: Difficulty Accessing High-Paying Markets

One of the challenges farmers' organizations faces is difficulty accessing high-paying markets. They only sell their produce to small-scale buyers, who act as intermediaries, buying it at lower prices. The low prices affect their profit margins, reducing the chance of gaining more budget for

Table 6
Results of the awareness and perception of LinkSFarm project

Particulars	Category	Frequency	Rank
Source of Project Information	Local government unit	5	3
	Cooperative/ ARBO	64	1
	Fellow Farmers	24	2
Perceived Benefits	Increased farmer income	69	1
	Access to New Markets	50	2
	Strengthened farmer cooperatives	0	No rank
	Improved farming technologies	0	No rank
	Support from government and NGOs	0	No rank
	Better farming practices	10	3
	Improved quality of produce	4	6
	Better Prices	9	4
	High Buying Price	6	5
Hinders in Participation in the Project	Lack of information about the project	5	4
	Capital/ Financial Constraints	79	1
	Time	9	3
	Transportation & Logistics	34	2

reinvestment and improved economic status and livelihood.

The challenge of reaching large and institutional market worsen their issue of low prices. As mentioned by Info002, *"Farmers sell their products to traders, not in the organization,"* which indicates that there is a problem with bypassing middlemen and connecting directly to institutional buyers which results to higher prices.

In a post by Department of Agrarian Reform, LinkSFarm aims to address this problem by streamlining agricultural production by applying the value chain process from the farming stage all the way to selling it to the market.

In line with Lagasca et al. (2024) and Singh et al. (2024), they said that limited market access and value chain integration are constraint to farmers income. In addition, the low participation in collective marketing and the dependence of the farmer on intermediaries, as reported by Orejudos et al. (2022), amplifies this issue. The importance of farmer organizations in terms of market access and bargaining power, as emphasized by Barret et al. (2017) and Birchall (2003), highlights the significance of initiatives such as LinkSFarm, as it is envisioned to enhance efficiency of production in the agriculture value chain and promote direct relationship between smallholder producers and food buyers to enhance smallholder market position.

2) Sub-theme 2: Lack of Capital and Financial Resources for the Organization

The second challenge faced by farm organizations is the lack of capital and financial resources. This is consistent with the result in the quantitative data that the reason for not joining the LinkSFarm project is due to capital/financial constraints, which can also be attributed to low prices for produce encountered during marketing the produce. It can also be noted that only 2% of the respondents cited that they receive financial support from the government. This limits the organization's investment in crucial resources needed to upgrade farming and marketing methods, increase efficiency, and effectively market and transport the produce. Hence, this affects the opportunity to expand their process more significantly.

As highlighted by Info001, *"Lack of capital for the organization to support the needs of the member/farmers"* is a challenge for farmers. Obtaining loans from external sources is a struggle many farmers face, as financing companies

sometimes require collateral or income history as proof of their capacity to pay. However, in previous results, most farmers only earned less than P10k and less than 1 hectare of land, disqualifying them from obtaining loans. This is consistent with the findings of Amanullah et al. (2020), which state that credit contracts are highly influenced by age, area of land, and family size. Young (2018) emphasized a strong correlation between productivity and income at a constant price. Hence, having enough financial support to acquire the necessary machinery and equipment to increase production efficiency is crucial.

As suggested by Hossain et al. (2024), agricultural intervention plays a significant role in poverty reduction and supports long-term potential benefits for the well-being of poor households. Cordonnier et al. (2024) also emphasized in their study the significance of large-scale agricultural intervention, such as programs or policies to generate higher agricultural yields, which help households in agrarian economies. Hence, LinkSFarm can help address the gap by facilitating wider financial options for farmers through microfinance or subsidies to help farmers upgrade their farm-to-market practices.

1. Major Theme 2. Organizational Challenges

The second challenge faced by farmers is the organizational challenges which is further categorized into difficulty in forming or sustaining farmer organizations, and misunderstandings and conflicts among farmers, especially non-members.

1) Sub-theme 1: Difficulty in Forming or Sustaining Farmer Organizations

Farmers' organization or cooperative helps in improving the welfare of farmers through empowering them to have bargaining power, providing better ways to enhance market access, and the benefit of shared resources which helps in the productivity of farming. However, forming organization among farmers is not easy and is hard to sustain. This can be due to lack of trust towards the organization, lack of interest in joining, or hesitant to venture new practices because farmers are used with conventional method of farming and selling. As presented in the quantitative result, 75% of the respondents are still using the conventional method of farming system.

To sustain an organization, everyone must have collective efforts and trust within the organizations which require shared

Table 7
Summary of the challenges farmer organizations face in implementing LinkSFaRM project

Informant	Informant ID	Challenges Faced with LinkSFaRM
1	INFO001	Lack of Capital for the organization to support the need of the member/farmers
2	INFO002	Farmers sell their products to trader not in the organization.
3	INFO003	Complying with the volume of produce to be delivered.
4	INFO004	Supplying to the institutional buyer, some farmers wanted to provide more than the allocated quantity per farmer.
5	INFO005	Commitment of the farmers to deliver to market.
6	INFO006	Consolidating the product to meet required volume
7	INFO007	No available vehicle for transportation of produce
8	INFO008	Consolidating the product and marketing
9	INFO009	Capital and transportation
10	INFO010	Capacity of farmers to deliver required volume of the products
11	INFO011	capacity of the organization to deliver
12	INFO012	low buying price
13	INFO013	commitment of farmers in the project
14	INFO014	transportation of the products
15	INFO015	consolidating farming products
16	INFO016	awareness of the purpose of the project

Table 8
Results on the major themes and sub-themes of challenges in implementing LinkSFaRM project

Major Themes	Sub-Themes
Market Access and Financial Constraints	Difficulty accessing high-paying markets Lack of capital and financial resources for the organization
Organizational Challenges	Difficulty in forming or sustaining farmer organizations Misunderstandings and conflicts among farmers, especially non-members
Infrastructure and Logistical Issues	Poor road infrastructure and delivery challenges Lack of storage and post-harvest infrastructure
Training and Knowledge Gaps	Lack of training on new farming techniques and Agro-enterprise development

goals and leaders to effectively manage the organization. As cited by INFO013, "*Commitment of farmers in the project*" is a problem in implementing the LinkSFaRM project which shows that some farmers are not fully engaged and committed in contributing to the success of the project. This can hamper the shared goals of the organization which could result in failed project.

This suggests the need for LinkSFaRM to emphasize the importance of building trust and commitment in the organization, underscoring the role of everyone for attaining common goals of uplifting the economic status of farmers through a more productive farming and systematic marketing and selling of produce.

This observation is consistent with literature, which stresses that collective commitment and trust constitutes an essential catalyst in the successful operation of farmer organizations (Barret et al., 2017; Birchall, 2003). Additionally, the study revealed poor participation and commitment of the members as well, which may jeopardise the efficient management and collective purpose of such organizations, which could have serious implications for programmes such as LinkSFaRM.

2) Sub-theme 2: *Misunderstandings and Conflicts Among Farmers, Especially Non-Members*

Misunderstanding and conflicts among farmers and between members and non-members is another challenge faced by farmers' organization. Some farmers failed to see the purpose and the value of organization resulting in conflicts within the community. As INFO013 cited, "*commitment of farmers in the project*", shows that some farmers do not trust the organizational goal of working together to promote the welfare of all farmers. The friction and divided efforts within the community hampers the efficiency which leads to failure in achieving the overall goals of the organization.

When farmers do not see the purpose and the goals of the

organization, this creates chaos, defeating unity of direction within the community. This challenge must be addressed by LinkSFaRM project by initiating activities that will unite all farmers such conflict resolution training, facilitating regular communication, and setting a clear expectation about the roles and benefits the organization can bring, creating a more unified and inclusive environment where everyone will be given the equal chance towards a long-term sustainability.

This is in line with the results reported by Barret et al. (2017) Birchall (2003), and Mugwe et al. (2018) who emphasize that trust, good communication, and the active involvement of the community are fundamental in making farmers' organization successful. These findings imply that conflict resolution and social capital building are likely to lead to stronger and stable groups, thus promoting LinkSFaRM in order to enhance elements of unity and clear roles within members.

J. Major Theme 3. *Infrastructure and Logistical Issues*

Another significant challenge faced by farmer organization in LinkSFaRM project is infrastructure and logistics, which hampers the ability to meet market demands, efficient and effective production, and delivery. This is further categorized into poor road infrastructure and delivery challenges, and lack of storage and post-harvest infrastructure.

1) Sub-theme 1: *Poor Road Infrastructure and Delivery Challenges*

Poor road infrastructure is the primary logistical challenge faced by organization which affects the timely delivery of their produce to the market. Delayed delivery may compromise the quality of the produce which could impact the expected profit of the farmers. As highlighted by INFO009, "*Capital and transportation*" and INFO0014, "*transportation of the products*" are problems affecting the ability of farmers to deliver their products effectively. Poor road infrastructure does

not only contribute to delay and damage to produce but also cause increased transportation costs. This situation worsens the ability of farmers to bring their products to larger market. This resulted to selling their produce to intermediaries at lower price affecting their ability to increase their profit margin.

In addition, INFO007 cited, *"No available vehicle for transportation of produce"*, which means that even with good road infrastructure, that absence of transportation vehicle such as trucks or delivery vehicles, still hinder the farmers in delivering their produce to the larger market on time.

Both poor road infrastructure and unavailability of transportation vehicles are obstacles in effectively delivery the produce to market on time, affecting both the quality of products and profit margin of farmers.

This result agrees with Lagasca et al. (2024) who emphasized that lack of infrastructure and restricted availability of transportation increase costs and reduce the market area, forcing farmers to sell their fruits and vegetable produce at reduced prices to middlemen. Mugwe et al. (2018) also pointed out that logistical constraints such as lack of good roads and transport facilities in addition to ineffective participation in collective marketing hamper farmers' income generating capacity and livelihood. These infrastructural challenges highlight the need for government and program interventions, such as LinkSFarM, to address access to markets and logistical barriers faced by smallholder farmers.

2) Sub-theme 2: Lack of Storage and Post-Harvest Infrastructure

The lack of storage and infrastructure structure are another bottleneck of farmer organizations. As highlighted by INFO006 and INFO008, *"Consolidating the product to meet required volume"* is important but is seen as challenge for farmers who do not have sufficient area to store all of their produce. This forces farmers to sell their produce immediately at lower prices, especially that they dealing with perishable products which may not be good to sell when it gets spoiled.

With no enough post-harvest infrastructure such as storage facilities, sorting equipment, and packaging tools, the quality of produce may be affected such as early deterioration or spoilage. This put pressures to the farmers to sell their produce and compromising the chance to sell them at the right time for better market prices. This negatively impacts the bargaining power and market opportunities.

Government projects like LinkSFarM could mitigate this by developing post-harvest infrastructures such as cold-storage that will prevent early spoilage of products, allowing farmers to wait for the right time when the market prices are high enough maximizing the potential of earning better income.

This result is consistent with those of Lagasca et al. (2024) reports that post-harvest losses and poor storage condition were major limitations and would be mainly contributing to the reduction of income and product quality of farmers. Similarly, Mugwe et al. (2018) emphasized that the lack of adequate post-harvest storage infrastructure affects the ability of farmers to preserve produce quality and restricts their market condition. Storage and processing infrastructure development efforts, facilitated by programs such as LinkSFarM, are therefore

crucial in increasing farmer ability to access better markets and contribute to overall well being.

K. Major Theme 4. Training and Knowledge Gaps

The last challenge faced by farmers organization is the training and knowledge gaps. As previously discussed in quantitative result, majority of the farmers belong to older generation and have been farming for more than 42 years using the conventional method. The following sub-theme discusses further this bottleneck for organization adopting LinkSFarM project.

1) Sub-theme: Lack of Training on New Farming Techniques and Agro-enterprise Development

A significant challenge faced by organization is the lack of training on new farming techniques and agro-enterprise development. This can be related to being used with the traditional methods that has been practiced and passed through generations, which affect the capacity to meet the changing demands of the market today. While traditional method has worked for many the past years, coping up with change especially with new technologies for a more productive and sustainable farming is important. In Poland, elderly farmers are relying on the conventional practices that have worked for years making it challenging to adjust with the modern farming methods and technologies (Satoła, 2019).

As emphasized by INFO010, *"Capacity of farmers to deliver required volume of the products"* and INFO013, *"commitment of farmers in the project"*, indicates that farmers are not fully accepting the new farming practices which results in lower volume of products affecting the ability to cope with the market demand.

Hossain et al. (2024) cited the importance of training farmers with modern methods for a more sustainable farming practices to raise productivity. LinkSFarM may consider providing training on new farming techniques and agro-enterprise development. It is important to raise awareness about the potential benefits of full embracing LinkSFarM project as this will help in maximizing the quantity and quality of produce, this will also empower the farmers on the strategies to employ for a more effective farming to distribution and selling of products to the market.

5. Conclusion

1. LinkSFarM project provides a promising benefit to the farmer such as increased welfare and income. However, despite the potential benefit of the project, several challenges are encountered during the implementation. These include financial constraint, market access, membership in farmers organization, infrastructure and knowledge gaps. Both the quantitative and qualitative result showed that financial constraint is the major challenge faced by farmers and organizations. With limited financial sources, farmers may not be able to procure the needed inputs to materialize the project. Limited market access also hinders the farmers to directly connect with larger market and institutions minimizing the chance of earning bigger profit margin. The findings also revealed that many farmers

are hesitant to join the organization due to lack of trust and misunderstanding between members and non-members. Availability of infrastructure are also relevant to process and store the produce while waiting for a higher market price. The old demographics of farmers and years of experience using the conventional method makes them accustomed to using traditional method than learning the technologies.

6. Recommendation

1. Policy makers may help in facilitating credit access that offers micro-financing and subsidies at low interest rates to farmers. This initiative will enable farmers facing financial or capital constraint to invest on farming techniques that improve overall productivity. Policies may include farmers education and awareness by facilitating training programs that will highlight the use of sustainable farming methods and agro-enterprise development. This will equip the farmers with the knowledge and skills empowering them to adopt the new farming and marketing methods and participate actively in farmers organization.
2. Smallholder farmers are encouraged participate in trainings and programs focused on new farming technologies, agro-enterprise development, and business management. This will help them better understand the potential benefits of the LinkSFarm project in enhancing their productivity, market access, and bargaining power. They may join farmers organization to benefit from collective marketing efforts, secure better pricing and share valuable resources. They are also encouraged to explore alternative income sources such as livestock raising or small business, to reduce their reliance on vegetable farming in case of price fluctuations.
3. Farmers' association and organizations may focus on initiatives that will foster trust and commitment among members. This initiative may include regular communication through meetings to determine what goes right and wrong. This will allow all members to raise their concerns and collaborate on solutions. They may do team building programs to strengthen camaraderie, revive team spirit, and ensuring everyone stay committed to the organizations shared goals, ultimately contributing to a successful project implementation.
4. The Department of Agrarian Reform may collaborate with financial institutions to offer subsidies and loans for farmers to help them adopt new farming methods and improve productivity. They may help in facilitating infrastructure development such as irrigations systems, roads, and post-harvest facilities in Agrarian Reform Communities. This improvement will help to enhance efficiency in farming operations, better market access, streamline logistics, and prolonged product quality, allowing farmers to hold their produce until market prices are favorable enough to maximize profit margins.
5. Future researchers may use this study as framework for similar research endeavors. It is recommended to conduct longitudinal studies to determine the impact of LinkSFarm project on farmers productivity, income, and sustainability. By conducting longitudinal studies, these can help in identifying the success and challenges of LinkSFarm project implementation. It is also recommended to explore on the reason of aging farmer population and investigate why many youths are not continuing farming as livelihood.

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