

Socio-Demographic Profile, Farming Challenges and Local Government Unit (LGU) Support to Rubber Farmers in Tampilisan, Zamboanga Del Norte: A Pre and Actual Pandemic Analysis

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Ed Jo Albert B. Padrones¹, Earlyn Kate G. Padrones¹, Bernard Niño Q. Membrebe², Ricky P. Alalid², Jay A. Roslinda³, Mario Baquiller⁴

¹Jose Rizal Memorial State University–Katipunan Campus, Katipunan, Zamboanga del Norte, Philippines

²Eastern Visayas State University–College of Technology, Tacloban City, Philippines

³Jose Rizal Memorial State University–College of Business Administration, Dapitan City, Philippines

⁴Jose Rizal Memorial State University–Tampilisan Campus, Tampilisan, Zamboanga del Norte, Philippines

Abstract

This study investigates the socio-demographic profile, farming challenges, and the Local Government Unit (LGU) support to rubber farmers in Tampilisan, Zamboanga del Norte, Philippines. The research employed a pre and actual-pandemic analysis to assess the effectiveness of LGU extension services in empowering rubber farmers. Data from 50 rubber farmers across 15 barangays were analyzed using a descriptive-correlation method. Findings reveal that rubber farmers in Tampilisan are predominantly middle-aged, have a high school education level, and have low monthly incomes. Farmers engage in diverse farming practices, including intercropping and integrated farming systems, demonstrating adaptive strategies for income diversification. While participation in LGU extension services was high before the pandemic, it significantly declined during the pandemic due to restrictions and limitations. Farmers identified several key challenges, including low rubber prices, capital constraints, and lack of skilled labor, which persisted before and during the pandemic. Despite these challenges, farmers reported moderate agreement on the benefits derived from LGU extension services, particularly regarding education for their children and food security for their families. Findings also suggest that farmers' income correlates with the types of crops planted, indicating that diversifying crops like coconut, banana, and fruit trees can lead to increased income. More so, the correlation between farmer participation and the acquisition of farming tools and planting materials underscores the positive impact of active engagement on resource access. Analyzing the above results, the study revealed the importance of sustained farmer engagement in extension services for enhancing agricultural resilience and livelihood sustainability. The insights elicited from this study include strengthening technical training and infrastructure, promoting farmer group participation, and fostering collaboration between the Local Government Unit (LGU), educational institutions, and government agencies to ensure the effectiveness of extension programs and support sustainable rubber farming practices in Tampilisan.

Keywords: innovative strategies, socio-demographic background, rubber farmers, extension services, intervention



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INTRODUCTION

Rubber farming, popularly known as cultivating rubber trees, primarily *Hevea brasiliensis*, is vital for producing natural rubber. This resource is essential for various industries, such as automotive and medical, and contributes to the income of smallholder farmers in developing countries like the Philippines. The challenges facing rubber farmers, identified by Imelda, Mulyo, Suryantini, and Masyhuri (2023), underscore educational interventions, replanting strategies, and infrastructure

improvements to enhance farm productivity and sustainability. The context of Tampilisan as a significant rubber-producing municipality facing pricing, production, and marketing challenges exacerbated by unforeseen disasters emphasizes the urgency of addressing these issues to support local farmers. By examining the socio-demographic profiles, farming characteristics, extension services, participation levels, challenges, and benefits received by rubber farmers pre- and post-pandemic through LGU initiatives, the study aims to evaluate the effectiveness of

these extension services in empowering the local rubber farming community in Tampilisan, emphasizing the need for sustainable support and socio-economic upliftment in the region.

The study assessed the economic empowerment of local farmers through the LGU's extension services in the Municipality of Tampilisan amidst the pandemic. It aimed to determine the respondents' socio-demographic background and farming characteristics, identify the extension services they availed, and evaluate their level of participation in these services provided by the LGU/Department of Agriculture. Additionally, the study explored the challenges faced by the farmers in rubber production and the benefits they received from the services. It examined the relationship between their socio-demographic background, farming characteristics, and participation in the extension services.

Conceptual Framework. This research investigates the impact of local government unit (LGU) extension services on rubber cultivators in Tampilisan, Zamboanga del Norte.

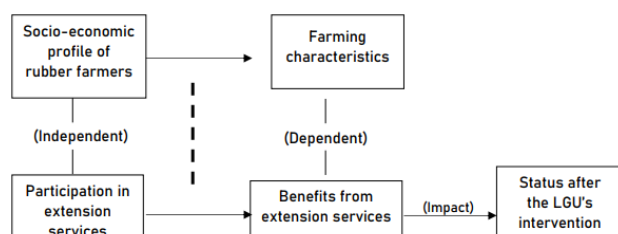


Figure 1
Illustration of the relationship between the major variables of the study

The primary objective is to examine the relationships among rubber farmers' socio-demographic profile, farming characteristics, rubber farmers' participation, and the benefits derived from extension programs. The conceptual framework, illustrated in Figure 1, emphasizes two fundamental correlations: 1) Relationship between socio-demographic profile and farming characteristics; and 2) Relationship between rubber farmers' participation and benefits obtained.

The first correlation looks into how the socio-demographic profile of rubber farmers, such as age, education level, and income, affects their farming characteristics. Previous study indicates that farmers with higher levels of education are more likely to adopt modern agricultural practices and diverse farming systems. Farmers with lower income, on the other hand, may have more difficulty obtaining resources to employ sophisticated farming methods. Thus, the study investigates the relationship in the context of rubber farming in Tampilisan, taking into account the unique challenges and opportunities faced by farmers in the area.

The second investigated the correlation between farmers' engagement with LGU extension services and the benefits they acquire. This underlines the benefits of actively participating in extension initiatives. This suggests that such participation can improve individuals' knowledge, skills, and access to resources, resulting in tangible advantages such as increased income, better educational opportunities, and improved food security. The study assessed the impact of LGU extension services on the well-being of rubber farmers in Tampilisan, taking into account the challenges posed by the COVID-19 pandemic.

The foundation of this theory is based on the perception that agricultural extension services play a vital role in empowering farmers and encouraging sustainable practices. The research incorporates theories from agricultural development, social science, and extension education, highlighting the significance of comprehending farmer needs, customizing programs to address those needs, and assessing their influence on farmer resilience. The study acknowledges the importance of mediating variables in shaping the connection between extension services and their benefits. These variables include access to resources, information dissemination, and farmer capacity building. By exploring these mediating factors, this gains an understanding of how LGU extension services contribute to the success in rubber farming.

LITERATURES

The study is grounded on the theoretical proposition that effective agricultural extension services play a vital part in empowering farmers and promoting sustainable agricultural practices. This literature review rigorously examines important research that emphasizes the significance of understanding the needs of farmers, customizing extension programs to meet those demands, and assessing the impact of extension services on the resilience and welfare of farmers.

Socio-economic Factors and Farming Practices. Recent research has investigated the correlation between socio-economic factors, farming practices, and agricultural extension services. Joshi and Narayan (2019) conducted a study on the performance of extension services in India, with a focus on the significance of comprehending the requirements of farmers. In a study conducted by Shakir et al. (2018), the researchers investigated the socio-economic impact of an extension program on rubber smallholders in Malaysia. The findings of the study revealed positive effects on the lives of the farmers. In a study conducted by Darshan et al. (2017), the importance of information in agricultural development was emphasized, particularly in the context of farmers in Haryana, India. The researchers also explored the potential of utilizing social media among these farmers. In a recent study conducted by Sumo et al. (2022), the impact of socio-economic factors on the demand for extension services among farmers in post-conflict Liberia was examined. The findings of the study indicated that variables such as farm income, ownership of mobile phones, and awareness of available services played a significant role in influencing the demand and utilization of these services. The studies highlight the significance of customizing extension programs to meet the specific requirements and socio-economic backgrounds of farmers in order to improve their effectiveness and impact.

Extension Services and Farmer Resilience. The provision of extension and advisory services is of critical importance in fostering resilience

among smallholder farmers, especially when confronted with challenges such as the COVID-19 pandemic (Davis et al., 2014). These services seek to enhance farmers' capabilities by promoting the sharing of knowledge, transferring technology, and facilitating the establishment of social groups (Kabir & Darr, 2021). Notwithstanding the disruptions experienced during the pandemic, extension services continued to be crucial for enhancing farmers' production and ensuring food security (Krithika & Karthikeyan, 2023). In this period, farmers viewed information regarding government schemes and online training activities as efficacious interventions (Krithika & Karthikeyan, 2023). Long-term viability requires extension systems to adjust to evolving conditions by integrating many strategies including public-private collaborations, ICT utilization, and gender equality advocacy. Collaboration among many stakeholders is essential for achieving successful extension sustainability, as no individual entity can tackle the wide range of issues encountered by small-scale farmers (Siankwilimba, 2021).

Meeting Farmer Information Needs. Meeting the information needs of marginalized and smallholder farmers poses challenges for agricultural extension services (Glendenning et al., 2010). Research emphasizes the significance of demand-driven strategies that are customized to meet the specific requirements of farmers (Birner & Anderson, 2007). According to Babu et al. (2012), farmers are mainly interested in obtaining information related to pest management, fertilizer application, seed varieties, and credit. There is a range of information sources available, including private input dealers and state agricultural extension staff. However, high and medium information searchers tend to utilize a wider variety of sources. Access to quality information continues to be uneven, despite various reform initiatives (Rushdie et al., 2022). Various factors can impact the information-seeking behavior of farmers, such as their level of education, economic status, land area, and membership in organizations (Babu et al., 2012). In order to enhance effectiveness, it is

important for extension services to tackle reliability and timeliness concerns, take into account farmers' communication preferences, and explore creative outreach approaches that align with local information requirements (Rushdie et al., 2022; Glendenning et al., 2010).

Impact of Extension Services on Farmer Well-being. Agricultural extension services are vital in empowering farmers and promoting sustainable agricultural practices. These services support the transfer of knowledge, improve the capabilities of farmers, and contribute to the development of rural areas (Becerra-Encinales et al., 2024; Arnés et al., 2018). Farmer Field Schools (FFSs) have proven to be a valuable tool in enhancing sustainability and food security in peasant farming systems. They have had enduring effects on participation, access to essential services, and the conservation of natural resources (Arnés et al., 2018). Extension activities conducted by educational institutions have the potential to greatly benefit communities, serving as a source of inspiration for transformation and enhancing the quality of life for citizens (Corpuz et al., 2022). Agricultural extension agents play a crucial role in developing pest management skills and improving farmer capabilities, ultimately resulting in higher productivity (Eryanto et al., 2023). Nevertheless, certain obstacles, such as infrequent consultations and the challenges of mobilizing residents, may impede the efficacy of extension services (Corpuz et al., 2022). In summary, these studies highlight the significance of tailoring extension methods to specific local circumstances and promoting cooperation between farmers and extension workers to achieve sustainable agricultural development.

The studies emphasize the significance of comprehending the socioeconomic status of farmers, tailoring extension programs to address their particular requirements, and evaluating the effects of these programs on farmer resilience and well-being. This study expands on existing research by investigating the efficacy of LGU extension services in Tampilisan, taking into account the distinct challenges and opportunities faced by rubber

farmers in the area. The study aims to provide valuable insights into the role of extension services in empowering farmers and promoting sustainable agricultural practices by analyzing the socio-economic profile of farmers, their participation in extension services, and the benefits they received.

METHODOLOGY

Research Design. The study employed a descriptive-correlational research design. It investigated the relationship between socio-demographic profile and farming characteristics as well as the relationship between rubber farmers' participation in extension services provided by the LGU and the benefits they obtained. The initial correlation specifically examined the influence of socio-demographic factors, such as age, education level, and income, on the farming practices of rubber farmers. Meanwhile, the second correlation evaluated the effects of farmer engagement in LGU extension services on the benefits they received. Examining the correlation between participation in extension services and benefits obtained can provide valuable insights into the effectiveness of LGU programs. This analysis helps identify areas for improvement and ensure that future programs are designed to effectively meet the needs of rubber farmers. The research design used in this study enabled a thorough examination of the relationships under investigation. The findings shed light on the significance of customizing extension services to cater to the unique requirements of various farmer groups, as well as the effects of active involvement in extension programs on for the benefit of farmers.

Population. The respondents in this study were rubber farm owners from the Municipality of Tampilisan, Zamboanga del Norte. As shown in Figure 2, the map shows the detailed layout of the Municipality of Tampilisan. It highlights the various barangays (villages or districts) within the municipality. It provides a clear visual representation of its administrative boundaries and position within the larger context of the Zamboanga Peninsula.

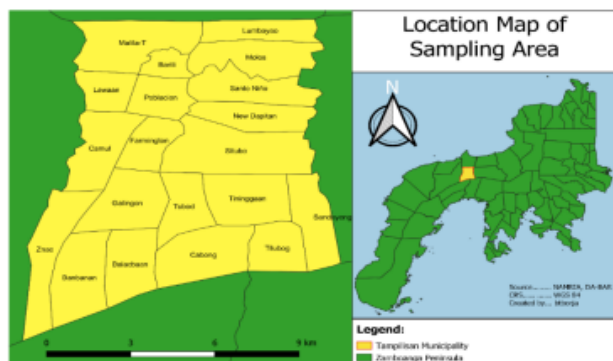


Figure 2

Map of the Municipality of Tampilisan, Zamboanga del Norte

Source: Geographic Information System (GIS) Software

Table 1 below shows the respondents who were surveyed according to their barangays. Location lists were obtained from the municipal agriculture office to estimate the total sample size. The respondents were selected randomly according to availability.

Table 1

Respondents of the study with their corresponding location

Barangay	Number of respondents
Balacbaan	2
Banbanan	5
Cabong	4
Camul	2
Farmington	1
Galingon	5
Lawaan	6
Lumbayao	2
Molos	2
New Barili	4
New Dapitan	4
Poblacion	3
Tininggaan	1
Tubod	7
Znac	2
Total	50

Research Instrument. The researchers constructed a questionnaire to collect the data. The level of participation, problems encountered, and benefits obtained were based on the study of Narita (2011). To ensure the reliability and validity of the instrument, pilot testing was conducted and was analyzed using SPSS v16 statistical tool. It is a small-scale study preparatory to conducting survey research to determine the reliability or internal consistency of a set of scale or test items. This

was done to 30 non-respondents from barangay Znac before the survey's implementation. The Cronbach alpha of the instrument was .731. This indicated an acceptable level of reliability, suggesting that the items on the scale are sufficiently consistent in measuring the intended construct. In quantifying the responses of the respondents, along with their level of participation on the extension services provided by the LGU of the Municipality of Tampilisan, the following rating scale were used:

Arbitrary Value	Numerical Limits	Adjectival Rating	Symbol
5	4.21 – 5.00	Always	A
4	3.41 – 4.20	Often	O
3	2.61 – 3.40	Sometimes	So
2	1.81 – 2.60	Seldom	Se
1	1.00 – 1.80	Never	N

For the challenges encountered by the respondents in rubber farming, the following rating scales were used:

Arbitrary Value	Numerical Limits	Adjectival Rating	Symbol
5	4.21 – 5.00	Very Much Serious	VMS
4	3.41 – 4.20	Much Serious	MS
3	2.61 – 3.40	Moderately Serious	MoS
2	1.81 – 2.60	Less Serious	LS
1	1.00 – 1.80	Not Serious	NS

In the benefits derived by farmers from the extension services provided by the LGU, responses were based on the following scaling procedure:

Arbitrary Value	Numerical Limits	Adjectival Rating	Symbol
5	4.21 – 5.00	Very Much Agree	VMA
4	3.41 – 4.20	Much Agree	MA
3	2.61 – 3.40	Moderately Agree	MoA
2	1.81 – 2.60	Less Agree	LA
1	1.00 – 1.80	Do Not Agree	DNA

Data Collection. Before the actual conduct of the study, a formal request and permission of the study site was established from the Municipal Mayor to the Municipal Agriculturist to identify the respondents, obtain site information, and acquire additional preliminary facts. Important informants were also included such as Agricultural Extension Workers (AEWs),

Barangay Officials, Farmers' Association Officials, and 11 rubber owners.

The survey was conducted in February 2022 utilizing a centralized survey. The survey was conducted using a structured questionnaire among rubber farmers in Tampilisan. The research focused in gathering information about their socio-demographic profile, farming characteristics, participation in LGU extension services, challenges faced, and benefits obtained.

Ethical Consideration. During the survey, the researchers requested permission from the respondents to participate and ensured respect for their beliefs. Additionally, respondents were informed that their names will be kept confidential.

Statistical Analysis. Using SPSS v16 software, the study employed frequency distribution, percentage, weighted mean, and Chi-square to analyze the data. Frequency distribution and percentage were used to quantify the socio-demographic profile and farming characteristics of the rubber farmers while weighted mean was used to describe the participation in the extension services, challenges encountered, and benefits obtained from the extension services of the LGU. Lastly, the Chi-Square was used to test the significant relationship between the farmers' farming characteristics and demographic profile and the significant relationship between the level of farmers' benefits and their extent of participation in the extension services.

RESULTS AND DISCUSSION

Socio-demographic profile and farming characteristics of rubber cultivators. The study on rubber farmers in Tampilisan offers valuable insights into the community's socio-demographic makeup and agricultural methods. The predominance of middle-aged individuals, particularly in the 30-39 and 50-59 age groups, suggests a mature and experienced farming population. The high rates of high school graduates indicate a level of literacy crucial for adopting new technologies and advanced

agricultural techniques, underscoring the significance of education in improving farming practices. The income distribution, notably below Php 5,000 per month, underscores rubber farmers' financial hurdles, influenced by factors like low rubber prices and resource constraints, impacting their livelihoods. Membership in farmer organizations is crucial in providing access to vital services and resources, emphasizing the collaborative effort in bolstering knowledge and support within the farming community (Table 2). Adopting diverse farming systems, such as intercropping and integrated farming, reflects farmers' adaptive strategies to optimize productivity and income amidst industry challenges (Table 3). The success of intercropping, supported by previous studies (Agwu, 2006; Otene, Obinne, & Egwumah, 2011; Verma, 2016; Ushadevi & Jayachandran, 2001), highlights the economic advantages of diversification in rubber farming. In contrast, the holistic approach to farming, incorporating mixed propagation methods and animal husbandry, underscores a resilient and sustainable agricultural model among rubber farmers in Tampilisan, promoting income generation and agricultural viability amid industry obstacles.

Table 2
Socio-demographic profile of rubber cultivators, Tampilisan, Zamboanga del Norte

Socio-Demographic Profile	Categories	Frequency	Percentage
Age	10 to 19	2	4
	20 to 29	4	8
	30 to 39	14	28
	40 to 49	10	20
	50 to 59	14	28
	60 to 69	6	12
Total	Average: 44 years old	50	100
Ethnic Origin	Ilonggo	2	4
	Cebuano	39	78
	Subanen	9	18
Total		50	100
Education	Elementary Level	7	14
	Elementary Graduate	5	10
	High School Level	12	24
	High School Graduate	14	28
	College Level	7	14
	College Graduate	3	6
	Postgraduate	2	4
Total		50	100
Monthly Income	0-5k	29	58
	5001-10k	7	14
	10,001-15k	12	24
	20,001-25k	1	2
	35,001-Above	1	2
Total		50	100
Membership of Organization	Yes	36	72
	No	14	28
Total		50	100

Table 3

Farming characteristics of rubber cultivators, Tampilisan, Zamboanga del Norte.

Characteristics	Categories	Frequency	Percentage
Farming System	Monocropping	13	26
	Integrated Farming System	15	30
	Intercropping	22	44
Total		50	100
Method of Propagation	Sexual	7	14
	Asexual	9	18
	Mixed	34	68
Total		50	100
Other Crops Planted	None	11	22
	Banana	6	12
	Coconut	10	20
	Fruit Trees	6	12
	Cereal Crops	3	6
	Mixed	14	28
Total		50	100
Raising of Farm Animals	Yes	47	94
	No	3	6
Total		50	100

Level of participation of the rubber farmers from the extension services provided by the LGU before and during the pandemic. The result examines the extension services provided by the LGU of Tampilisan to rubber cultivators, focusing on farmers' participation levels before and during the pandemic. Before the pandemic, respondents actively engaged in these services, as shown by a Total Weighted Mean of 3.70, indicating frequent participation in the LGU's general extension programs. As highlighted by Nahayo, Omondi, Zhang, Li, Pan, & Joseph (2017), the motivation for farmers to engage in these services stems from personal benefits and economic advantages derived from participation. However, during the pandemic, the Total Weighted Mean dropped to 1.77, interpreted as "Never," signifying a significant decline in participation levels due to restrictions and limitations imposed by the pandemic. This aligns with the findings of Sulistyono & Hayati (2017), emphasizing how public health measures impacted farmers' engagement in LGU's extension services, underscoring the challenges faced during the pandemic in maintaining participation in agricultural initiatives (Table 4).

Challenges encountered in rubber farming before and during the pandemic. The results in Table 5 delved into the significant challenges faced by rubber farmers in Tampilisan before and during the pandemic, highlighting thirteen key obstacles.

Table 4

Level of participation of farmers from the extension services provided by the LGU before the pandemic, (N=50)

Extension Services	Before Pandemic	During Pandemic
Free technical training and seminar	4.32	1.50
Free tapping tools	1.16	1.00
Market linkages	4.90	3.06
Production facilities	4.64	1.86
Post-harvest facilities	4.46	1.10
Crop insurance	4.72	1.36
Educational assistance	1.40	1.02
Credit assistance	2.94	1.04
Farm-to-market road	4.80	4.52
Free planting materials	3.68	1.28
Average Weighted Mean	3.70	1.77

Legend: 1.00 – 1.80 = Never; 1.81 – 2.60 = Seldom; 2.61 – 3.40 = Sometimes; 3.41 – 4.20 = Often; 4.21 – 5.00 = Always

These are low cup lump prices, capital inadequacy, high production costs, and a lack of skilled labor and facilities. The respondents rated these challenges based on their severity, with most issues deemed "Very Much Serious," showcasing the critical nature of these obstacles in rubber farming. The consistent seriousness of these challenges before and during the pandemic underscores the enduring nature of these difficulties. Previous research by Abolagba & Giroh (2008) and Furoc-Paelmo et al. (2019) supports these findings, emphasizing recurring issues such as low prices, yield limitations, market access, technical expertise, and resource constraints that hinder rubber farming sustainability and profitability.

Table 5

Degree of the seriousness of challenges encountered by the respondents on rubber farming before and during a pandemic, (N=50)

Challenges Encountered	Before Pandemic	During Pandemic
Low price of cup lumps	4.70	4.70
Lack of capital	4.86	4.82
High production cost (inputs)	4.70	4.80
Lack of skilled laborers/farm workers/tappers	4.18	4.20
Lack of production facilities	4.54	4.46
Lack of postharvest facilities	4.64	4.62
Poor technical knowledge of farming	4.46	4.52
High Degree of pest and disease incidence	4.78	4.86
Lack of market outlet	2.30	2.64
Lack of planting materials	3.94	4.00
Lack of government support	4.68	4.70
Lack of Investment in Budwood Nursery	3.46	3.62
Exposure to environmental hazards:		
• landslide	4.24	4.24
• strong winds	4.50	4.50
• heavy and excessive rain	4.88	4.88
• droughts	4.18	4.18
• flood	4.16	4.16
• forest fire	2.70	2.70
Average Weighted Mean	4.22	4.26

Legend: 1.00 – 1.80 = Not Serious; 1.81 – 2.60 = Less Serious; 2.61 – 3.40 = Moderately Serious; 3.41 – 4.20 = Much Serious; 4.21 – 5.00 = Very Much Serious

Benefits derived by rubber farmers from the extension services of the LGU. The result delves into the perceptions of rubber farmers in Tampilisan regarding the benefits derived from the LGU's extension services, revealing a moderate agreement among respondents with a weighted mean of 3.46. Notably, benefits like educating children and ensuring food security for the family were highly valued, resonating as "Very Much Agree" with weighted means of 4.22 and 4.32, respectively, showcasing the significant impact on farmers' livelihoods. In contrast, acquiring farming tools and planting materials garnered the lowest weighted mean of 1.54. These findings align with Rodrigo, Thenakoon, & Stirling (2001), emphasizing rubber's role in offering a stable household income, with respondents strongly agreeing on the long-term revenue potential of rubber farming. This underlines the farmers' understanding of the benefits of agricultural engagement in capacity building, exposure to new techniques, and empowerment, as Nxumalo and Oladele (2013) highlighted, signaling opportunities for increased productivity and poverty alleviation within the community (Table 6).

Table 6

Benefits derived by rubber farmers from extension services of LGU, Tampilisan, Zamboanga del Norte, (N=50)

Benefits	Wtd Mean
Increase in income	3.68
Provide Education to children	4.22
Provide food security to the family	4.32
Low operation and maintenance cost	3.02
Provide long-term crops for long-term income	4.10
Provide a source of household income	4.10
Lessen the household's expenses	3.54
Provide crop diversification, thereby reducing risks	4.02
Gained technical knowledge and skills in rubber farming	3.38
Acquired farming tools and planting materials	1.54
Acquired household assets	2.52
Establish linkages and support from stakeholders and government	3.10
Average Weighted Mean	3.46

Legend: 1.00 – 1.80 = Not Agree; 1.81 – 2.60 = Less Agree; 2.61 – 3.40 = Moderately Agree; 3.41 – 4.20 = Much Agree; 4.21 – 5.00 = Very Much Agree

Relationship between socio-demographic profile and farming characteristics of rubber farmers. The study examines the relationship between rubber farmers' socio-demographic profiles and their farming characteristics (Table 7), revealing that income and organization membership significantly impact farming practices. The findings suggest that farmers'

income correlates with the types of crops planted, indicating that diversifying crops like coconut, banana, and fruit trees can lead to increased income. Membership in farmer organizations such as Farmers' Associations is crucial in enhancing the farming system, crop diversity, and livestock management, showcasing the benefits of collective support and resource sharing. These organizations facilitate indirect assistance from the LGU through technology transfer, training sessions, and provision of planting materials, underscoring the importance of socio-demographic factors in influencing rubber farming success. Additionally, previous research by Aliyu, Mohd, & Nasir (2021) highlights the influence of socio-demographic and farming characteristics on farmers' technical efficiency, emphasizing factors like age, education, income, and organizational membership in shaping agricultural outcomes.

Table 7

Chi-square tests on the relationship between socio-demographic profile and farming characteristics

Socio-demographic factors	Farming Characteristics			
	Farming system	Propagation method	Crops planted	Animal raised
• Age	16.871	10.807	28.115	1.114
<i>P-value</i>	.077	.373	.303	.953
• Ethnic Origin	2.788	1.114	8.990	.900
<i>P-value</i>	.594	.737	.533	.638
• Educational attainment	15.313	15.231	39.067	10.106
<i>P-value</i>	.225	.230	.124	.120
• Income	8.533	6.907	34.058	1.430
<i>P-value</i>	.383	.547	.026*	.839
• Membership of Organization	9.906	5.964	19.691	8.207
<i>P-value</i>	.007**	.051	.001**	.004**

The asterisk indicates statistical significance

**Highly significant ($P < 0.001$); *Significant ($P < 0.05$)

Using Chi-square Test

Relationship between rubber farmers' participation in extension services and the benefits received from the LGU before and after the pandemic. The study on rubber farmers in Tampilisan highlights the significance of farmer engagement in the Local Government Unit's extension activities before and during the pandemic and the benefits derived from these services. The correlation between farmer participation and the acquisition of farming tools and planting materials underscores the positive impact of active engagement on resource access. Despite challenges during the pandemic, high participation levels in extension services like market linkage and farm

infrastructure demonstrate the LGU's ongoing support for rubber farmers. However, a decline in benefits during the pandemic suggests reduced farmer participation, affecting outcomes such as education, food security, and household income. This underscores the importance of sustained farmer involvement in extension services for enhancing agricultural resilience and livelihood sustainability in Tampilisan (Table 8).

Table 8

Chi-square test on the relationship between the rubber farmers participation and the benefits obtained from the LGUs extension services before and after the pandemic

Benefits of extension services from the LGU	Before Pandemic		During Pandemic	
	Number of respondents based on the level of participation	P-value	Number of respondents based on the level of participation	P-value
Increase in income	7.240	.841	10.531	.230
Provide Education to children	13.053	.365	7.764	.457
Provide food security to the family	8.409	.752	2.573	.958
Low operation and maintenance cost	12.907	.376	5.036	.754
Provide long-term crops for long-term income	4.475	.973	3.132	.926
Provide a source of household income	6.203	.719	3.950	.683
Lessen the household's expenses	7.435	.828	7.667	.467
Provide crop diversification, thereby reducing risks	7.767	.803	2.966	.936
Gained technical knowledge and skills in rubber farming	10.226	.596	10.617	.224
Acquired farming tools and planting materials	30.860	.002**	24.556	.002**
Acquired household assets	8.842	.716	9.663	.289
Establish linkages and support from stakeholders and the government	12.630	.397	8.392	.396

The study emphasizes the vital role of empowering rubber cultivators in Tampilisan through the Local Government Unit's extension services, recognizing the significant impact on farmers' livelihoods as rubber cultivation is their primary income source. By fostering a culture of learning and innovation among farmers, they can drive positive change in agricultural practices, as Dolinska & D'Aquino (2016) highlighted. Engaging in various learning activities such as seminars, group discussions, and agricultural training enables farmers to enhance their knowledge, skills, and attitudes, as noted by Heryanto (2013). Karim, Handayawati, & Ruminarti (2012) stress the importance of sustainable agricultural extension activities in rural areas, facilitating farmer development through education and mentoring. Collaboration within farmer groups promotes the adoption of new technologies and increases agricultural profitability, indicating a positive correlation between farmers' learning, innovation, and group success.

Conclusion. The study focused on rubber farmers' socio-demographic profile and farming practices in the Municipality of Tampilisan. It highlighted that the farmers were typically middle-aged, averaging 44 years, with most having completed secondary education, engaging in small-scale farming with low family incomes. The research emphasized the positive impact of farmers' organizations on raising awareness of services and facilitating access to resources. The findings indicated that farmers adopted varied practices, such as intercropping and diversified farming, leading to increased income generation. Challenges during the pandemic restricted extension service engagement, impacting productivity and income. The study recommended enhancing technical training and infrastructure and promoting farmers' group participation to empower rubber farmers in Tampilisan, Zamboanga del Norte, emphasizing the importance of support for sustainable farming practices.

Recommendations. The study emphasizes the significance of using the research findings as a basis for the sustainable development of rubber farming and improving the socio-economic conditions of rubber farmers in Tampilisan. Various stakeholders, such as farmers and extension agents, can utilize the insights from the study to adopt strategies like intercropping and diversified farming. This can encourage participation in farmer organizations, leading to a greater understanding, higher income, and risk management. Policymakers could utilize this research as a guide for future regional agricultural planning while emphasizing the need to engage small-scale farmers in ongoing extension programs. The Department of Agriculture's Local Government Unit can benefit from the research to improve support and services for rubber cultivators, collaborating with educational institutions and government agencies to strengthen extension services and ensure sustainable agricultural practices within the community.

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