Factors Affecting the Adoption of High-Value Vegetable Production in Alangalang, Leyte, Philippines

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Abstract:

This study was conducted to evaluate the different factors influencing the adoption of high-value vegetable production in Alangalang, Leyte, Philippines. A total of 110 randomly selected farmers serve as respondents of this study. The sample size was calculated using Slovin's formula. The data were gathered using an interview schedule, and descriptive statistical measures were performed to analyze the data. Results revealed that most of the respondents (44.5%) were senior adults (60 years old or above). The majority were male (54.5%) and married (83.6%). Most (50.9%) of the respondents were at the elementary level, and all (100%) of them were tenants. And it is also found that factors influencing the adoption of high-value vegetable crops were a) economic, b) institutional, and c) technological. In addition, results also revealed that the serious problems in the adoption of high-value vegetable crops include the losses of vegetable production due to natural calamities (2.92%), lack of High-Yielding Variety (HYV) seeds (2.68%). The study recommends that farmers must adopt HYV vegetable seeds since it is evident that they can increase yield, profit, lower the production cost, save time and effort, and reduce crop losses. Moreover, technical help from the agricultural extension agent of the Local Government Unit (LGU) should always be present and support farmers, especially in dealing with the losses of vegetable production due to natural calamities.

Keywords: High-value vegetable crops, adoption, economic factors, institutional factors, technological factors

Introduction

The term vegetables refers to edible plants or portions of herbaceous annual or perennial crops that can be eaten raw (green/fresh) or cooked for a short time. Since vegetables are a key element of human nutrition, cultivating them is one of the worldwide activities that is practiced in every economy (Casinillo et al., 2024; Kharaishvili & Aduashvili, 2024). In recent years, the production of vegetable crops has steadily expanded worldwide. Despite being labor-intensive, vegetable growing is a popular high-income farming activity among farmers, particularly when using high-value vegetable crops (Tripathi et al., 2024). High-value commercial crops are those that, when traded in fresh form, provide competitive returns on investment. According to Wida die et al. (2024), growing high-value vegetables is a viable business opportunity to lower rural unemployment and poverty in developing countries. In the Philippines, vegetable farming is a vital industry that contributes to the country's economy (Seriño et al., 2017; Enerlan & Bulayog, 2020). In fact, in the

study of Casinillo (2020), it is mentioned that the Philippine government is supportive of the vegetable farmers, which provides financial support, training, and extension agents to improve the production process. In addition, the Local Government Unit (LGU) has provided different programs that support vegetable farmers, especially the smallholder and poor farmers, in regard to their financial and agricultural inputs (Aguda et al., 2022). Apparently, vegetable production is one of the major sources of food and livelihood for many Filipino households and farmers. Hence, studies that concern the improvement of vegetable production are vital to attain sustainability.

A big portion of the entire agricultural output comes from the vegetable sector in the Philippines, which also significantly boosts the country's market and economy (Lantican et al., 2008). Despite this, the nation's current production, marketing, and distribution methods continue to result in an insecure vegetable supply due to some challenges. In fact, the vegetable production in the country faces problems and challenges like pests and diseases, weather issues, and inefficient market distribution (Bendijo et al., 2024). Moreover, vegetable farmers are dealing with high agricultural inputs, low yields, inefficient market transactions, and a poor value chain that hinders their production process. In that case, farmers must improve their knowledge and practices, and involvement in the farmers' association to learn innovative technologies that enhance their farming skills (Valenzona et al., 2020; Red et al., 2021; Cadenas et al., 2025; Lodero et al., 2025). Moreover, some studies recommended that to improve their production level, farmers must adopt the high-value vegetable crops to improve their yield and attain an efficient farming system and market activities (Tripathi et al., 2024; Widadie et al., 2024). Furthermore, in the study by Ugali et al. (2025), it is stated that trainings are vital for farmers to improve their knowledge, practices, and adoption of technologies. In Eastern Visayas, Philippines, especially in the municipality of Alangalang, Leyte, the majority of the farmers have been adopting high-value vegetable crops, particularly in the barangays of Binongtoan, Cavite, San Vicente, Tombo, and San Isidro, to improve their production activities and maximize their profit. The common high-value vegetable crops grown in the locality include sweet pepper, cucumber, ampalaya, tomato, peechay, and lettuce, among others. Growing high-value vegetable crops has been a source of livelihood for many farmers in the municipality. However, there are still challenges that the farmers are facing, and they need to be addressed to obtain sustainable goals and improve the lives of vegetable farmers. It is considered a research gap in this current study.

Moreover, although there are many studies related to the factors that can affect the adoption of high-value vegetable crops, nothing has been done yet in the municipality of Alangalang, Leyte, Philippines; hence, this study was conducted. Generally, this study aimed to determine the factors influencing the adoption of high-value vegetable production among vegetable farmers in Alangalang, Leyte. Specifically, this study aimed to: (1) describe the socio-demographic characteristics of the farmers; (2) determine factors that influence the adoption of high-value vegetable crops in terms of economic factors, institutional factors, and technological factors; and (3) identify the problems encountered by vegetable farmers. This study is important because it will provide insights into the socioeconomic, technological, and institutional factors that affect farmers' decision-making in adopting high-value vegetable farming. Findings from this research can guide policymakers, local government units, and agricultural extension workers in formulating appropriate programs and interventions that will enhance farmers' productivity, increase their income, and promote sustainable agricultural development in the municipality. Moreover, it can contribute to the literature on agricultural adoption studies and serve as a reference for future researchers who aim to explore related topics.

Methodology

This study focused on evaluating the different factors influencing the adoption of high-value vegetable production in the selected farmer associations in Alangalang, Leyte, Philippines. The research design used in this study is descriptive in nature, which uses standard statistical measures to describe the variables of interest. This study was conducted from March to July 2023 in the selected farmer associations in Alangalang, Leyte, namely: Binongtoan, Cavite, San Vicente, Tombo, and San Isidro. These associations were selected because they were the active associations in Alangalang, Leyte, with vegetable growers. In addition, these barangays were chosen as they were found to be where most vegetable farmers living in this area adopted the high-value vegetable crops. Also, these were found to be the registered associations in the Local Government Unit of Alangalang. Alangalang is a second-class municipality in the province of Leyte, Philippines. It is a landlocked province with an area of 150.54 square kilometers or 58.12 square miles, which constitutes 2.38% of Leyte's total area. Its population, as determined by the 2020 Census, was 57,185. It is bounded on the north by Barugo and San Miguel, on the south by Pastrana, on the northeast by Tacloban City, on the east by Santa Fe, and on the west by Jaro. The list of all vegetable farmers was obtained from the Local Government Unit (LGU) of Alangalang, Leyte. The researcher used Slovin's formula to determine the sample size. Using Slovin's formula, with a population size of 151 and a margin of error of 5%, it is shown that there were 110 vegetable farmers in the sample size for this study. The sample size per barangay was determined through proportion, and the farmer respondents were selected at random. The distribution of samples is shown in Table 1.

Table 1. Distribution of respondents per barangay

Barangay	Number of farmers per barangay	Number of respondents per barangay
Binongtoan	23	17
Cavite	15	11
San Vicente	70	51
San Isidro	22	16
Tombo	21	15
Total	**151**	**110**

This study used an interview schedule to collect the data, which was drafted in English and translated into the local dialect (Leyte-Samarnon) to facilitate the interview. The data collected were the following: (1) socio-demographic characteristics of the respondents (age, sex, civil status, organizational affiliation, educational attainment, household size, reburial status, farm size, and monthly income); (2) factors affecting the adoption of high-value vegetable production (economic, institutional, and technological factors); (3) Problems encountered by the respondents in the adoption of high-value vegetable production. The questionnaire used a 5-point Likert scale for factors affecting the adoption of high-value vegetable production and a 3-point Likert scale for problems encountered. Tables 2 and 3 present the perception scores distribution and their interpretation.

Table 2. Adoption perception scores and their interpretation

Response	Perception Mean Scores	Interpretation
1	4.21 - 5.00	Strongly Agree
2	3.41 - 4.20	Agree
3	2.61 - 3.40	Neither Agree Nor Disagree
4	1.81 - 2.60	Disagree
5	1.00 - 1.80	Strongly Disagree

Table 3. Problem perception scores and their interpretation.

Response	Mean Perception score	Interpretation
1	1.00 - 1.67	Not a problem
2	1.68 - 2.33	A problem
3	2.34 - 3.00	A serious problem

The Prior to the data gathering, a formal request letter was prepared and sent to the Municipal Agriculturist of Alangalang, Leyte, to ask for the secondary data regarding the active and registered vegetable growers in the said municipality. Another request letter was sent to the respective association Presidents to formally ask for permission to conduct an interview. Upon approval, the researcher started to collect the data by also following the health protocol imposed by the Department of Health (DOH). The data were analyzed using descriptive statistics such as frequency distribution, percentage, and mean. The analysis was performed using Microsoft Excel, and the results were interpreted accordingly.

Results and Discussion

Socio-demographic profile of the respondents

Table 4 revealed the socio-demographic profile of the respondents. Nearly half of the respondents were senior adults (44.5%) and middle-aged adults (42%), with a mean age of 55 years old. This is supported by the study of Casinillo and Seriño (2022), which states that the average age of Filipino farmers is 50-59 years old. On average, the household size of a vegetable farmer is close to 5 members. In addition, the majority were male (54.5%) and married (83.6%). These findings are supported by the study of Casinillo (2020), which states that the majority of the farmers who work on the field are men and married. Most of the respondents have only reached the elementary level (50.9%), high school level (30.9%), and college level (18.2%). In terms of organization affiliation, a great number of participants (46.4%) were members of the San Vicente Integrated Farmers' Association (SVIFA). All of the farmer associations were tenants, had a farm size of less than one 1 hectare, and had a monthly income of less than 15,000.00 pesos. According to the study of Rada and Fuglie (2019), farm size can also affect the overall adoption, considering the crop acreage with the new technology may be a superior measure to predict the rate and extent of adoption of technology.

Table 4. Socio-demographic profile of the respondents

Variables	Frequency (n=110)	Percentage (%)
Age		
Adult (20-39)	16	14.5
Middle-aged adult (40-59)	45	41
Senior adult (60 and above)	49	44.5
Total	**110**	**100**
Mean: 55.66		
Sex		
Female	50	45.5
Male	60	54.5
Total	**110**	**100**
Civil Status		
Single	8	7.2
Married	92	83.6
Widow	9	8.2

Variables	Frequency (n=110)	Percentage (%)
Separated	1	1
Total	**110**	**100**
Organizational Affiliation		
BFA	16	14.5
SBFA	17	15.5
TBA	15	13.6
CAPA	11	10
SVIFA	51	46.4
Total	**110**	**100**
Educational Attainment		
Elementary level	56	50.9
High School level	34	30.9
College level	20	18.2
Total	**110**	**100**
Household size		
1-2	7	6.3
3-4	29	26.3
5-6	53	48.2
7-8	17	15.5
9-10	3	2.7
11-12	1	1
Total	**110**	**100**
Tenurial Status		
Tenant	110	100
Landowner	-	-
Total	**110**	**100**
Farm size		
Less than 1 ha.	110	100
1-2 ha.	-	-
Total	**110**	**100**
Monthly Income		
Less than 5,000	44	40
5,000-9,999	15	13.7
10,000-14,999	51	46.3
Total	**110**	**100**

Economic Factors Influencing the Adoption of High-Value Vegetables

Table 5 shows the data gathered about the common economic factors influencing the adaptation of high-value vegetable production. The highest weighted mean was 4.48, which revealed that the farmers strongly agree that the adoption of high-value vegetable production can increase yield and profit. The respondents also agreed that high-value crop production can save time and effort (WM=15), can reduce crop losses (WM=4.12), and can lower the production cost (WM=3.95). According to the study by Casinillo et al. (2024), adopting new technologies in vegetable farming can enhance the production activities that utilize the available resources, resulting in a sustainable management system. Tripathi et al. (2024) mentioned that the adoption of high-value vegetables can improve the performance of yield and enhance the profitability as well as the well-being of farmers.

Table 5. Economic factors influencing the adoption of high-value vegetable production

Economic	Weighted Mean	Description
It can increase yield	4.48	Strongly Agree
It can increase profit	4.48	Strongly Agree
It can lower the production cost	3.95	Agree
It can save time and effort	4.15	Agree
It can reduce crop losses	4.12	Agree
Average Weighted Mean	**4.24**	**Agree**

Institutional Factors Influencing the Adoption of High-Value Vegetable

Table 6 emphasized the institutional factors influencing the adoption of high-value vegetable production. The highest weighted mean is 4.6, which denotes that the farmers strongly agree that access to extension services (e.g., training) is one of the factors that influence the adoption of high-value vegetable production. Followed by a weighted mean of 2.80, which means that the farmers neither agree nor disagree that government support can be considered as one of the factors that influence the adoption of high-value vegetable production. On the other hand, with a weighted mean of 2.56, the framers disagree that access to credit agencies is one of the factors that influence the adoption of high-value vegetable production. As shown in this table, the average weighted mean is 3.34, which reveals that farmers neither agreed nor disagreed that institutional factors can influence the adoption of high-value vegetable production. This implies that the institutional factors do not reach other farmers, especially in the remote areas. In that case, some farmers are not able to adopt high-value vegetable strategies, implying that extension agents must be strengthened to reach and influence more small-scale vegetable farmers. In the study by Casinillo (2022), it is mentioned that extension agents are helpful for farmers to adopt a new technology that can aid them in improving their income from farming. In addition, Valenzona et al. (2020) portrayed that the success of farmers and their association is dependent on the support of the LGU and other government agencies, such as universities.

Table 6. Institutional factors influencing the adoption of high-value vegetable production

Institutional	Weighted Mean	Description
Government support	2.80	Neither Agree nor Disagree
Access to the credit Agency	2.56	Disagree
Access to Extension Services	4.65	Strongly Agree
Average Weighted Mean	**3.34**	**Neither Agree nor Disagree**

Technological Factors Influencing the Adoption of High-Value Vegetable

Table 7 illustrates the data gathered about the common technological factors influencing the adaptation of high-value vegetable production. The highest weighted mean was 4.02, which denotes revealed that the farmers agree that relative advantage is one of the factors that influence in the adoption of high-value vegetable production, Followed by the weighted mean 4, wherein the farmers agree that trialability and observability are considered as one of the factors that influence in the adoption of high value-vegetable production, while 2.98 weighted mean shows that the farmers neither agree nor disagree that compatibility is one of determinants in the adoption of high value-vegetable production, and a 2.59 weighted mean, which indicates that the farmers disagree that complexity is not one of the factors to consider. The average weighted mean of technological factors is 3.52, which reveals that technological factors can influence the adoption of high-value vegetable production. Casinillo et al. (2024) emphasized that the application of new technologies in vegetable farming is an

advantage since it can help improve the economic yield and profitability. Additionally, Tripathi et al. (2024) mentioned that the adoption of high-value vegetables leads to sustainable farming activities, which improve the market and economic processes as well as the well-being of farmers.

Table 7. Technological factors influencing the adoption of high-value vegetable production.

Technological	Weighted Mean	Description
Relative Advantage	4.02	Agree
Compatibility	2.98	Neither Agree nor Disagree
Complexity	2.59	Disagree
Trainability	4	Agree
Observability	4	Agree
Average Weighted Mean	**3.52**	**Agree**

Problems related to the adoption of high-value vegetable production

Table 8 showed the distribution of the respondents' level of responses towards problems related to the adoption of high-value vegetable production encountered by the farmers. It was found out that the serious problems in the adoption of high-value vegetable production include: a) losses of vegetable production due to natural calamities (WM=2.92), and b) lack of HYV seeds (WM=2.68). Meanwhile, the respondents considered the following as a problem: a) Lack of technical knowledge on how to grow vegetables (WM=1.15), and b) emergence of pests and diseases (WM=1.95). These results are consistent with the findings of Casinillo and Seriño (2022) that the agricultural inputs for farming are costly, but there are low market prices for the yield output. Moreover, in the study by Bendijo et al. (2024), it is depicted that the vegetable production faces some problems and challenges, such as pests and diseases, weather issues, and lack of support, among others.

Table 8. Problems related to the adaptation of high-value vegetable production

Problems related to the adoption of high-value vegetable production	Weighted Mean	Description
Lack of technical knowledge on how to grow vegetables.	2.10	A problem
High cost of labor or farm inputs.	1.55	Not a problem
Lower price of vegetables.	1.66	Not a problem
Emergence of pests and diseases.	1.95	A problem
Lack of HYV seeds.	2.68	A serious problem
Lack of technical help from the extension agent/ LGU.	1.15	Not a Problem
Poor access to farm credit.	1.23	Not a Problem
Losses of vegetable production due to natural calamities.	2.92	A serious problem
Average Weighted Mean	**1.91**	**A Problem**

Conclusion

The aims of this study are to evaluate the factors (economic, institutional, and technological factors) affecting the adoption of high-value vegetable production in Alangalang, Leyte, Philippines. In the economic factors, the findings imply that high-value vegetable crops can increase yield and profit. It can save time and effort, reduce crop losses, and lower the production cost. In the institutional factors, the findings imply that access to extension services can greatly affect the adoption of high-value vegetable production. This shows that the availability of extension services is really important. In terms of technological factors, the data revealed that high-value crops have a high relative advantage, are suitable,

and can be tested. This implies that in generating the innovation or intervention, it must be based on the farmer's needs. The result of the lack of High-Yielding Variety (HYV) implies that there must be sufficient funds allocated for seed subsidies. Hence, the study recommends that vegetable farmers are encouraged to adopt HYV seeds since it is evident that they can increase yield, profit, lower the production cost, save time and effort, and reduce crop losses. Technical help from extension agents/ LGU should always be present and do everything to support associations when there are losses of vegetable production due to natural calamities. The Department of Agriculture (DA) should provide sufficient HYV seeds and training on how to adopt high-value crop production. To provide farmers with the necessary knowledge, skills, and resources to succeed in niche markets, increase profitability, meet consumers' demand, and promote sustainability. Farmers' associations are highly recommended to have access to a credit agency to allow farmers to secure the necessary funds to purchase essential resources (including inputs) and manage their operations effectively. As for future research, one may incorporate more variables, such as access to credit, level of training, and agricultural inputs, among others, and use regression and correlation analyses to determine the influence of these variables on the adoption of high-value vegetables to enhance the current results of this research study.

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