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Research Paper

Farmer's Perceptions of the Upland Garlic Program in East Lombok Regency Through Sustainable Agriculture Approach

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Abstract

Rising national garlic consumption has coincided with declining production and harvested area due to import dependence. To address this issue, the Upland Garlic Program was implemented in East Lombok Regency to improve farmer productivity and income. This study evaluates the program's implementation based on farmers' satisfaction. The research was conducted from April to June 2025 using 68 questionnaires comprising 34 indicators across four dimensions: Input, Process, Output, and Outcome, distributed to randomly selected farmer group. Instrument validity and reliability were tested to ensure data accuracy. Data were analyzed using Service Quality, Customer Satisfaction Index, and Importance Performance Analysis. The results show 19 indicators with negative gaps and 15 with positive gaps, while the CSI score of 79.66% indicates very high farmer satisfaction. IPA identified seven priority areas for improvement, including program socialization, extension monitoring and evaluation, varietal suitability, seed quality, timely input distribution, market price stability, and post-program farm development.

Keywords: Service Quality; Customer Satisfaction Index; Sustainable Agriculture; Upland Program; Garlic.

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1. Introduction

Garlic (*Allium sativum*) has many benefits in everyday life, such as playing an important role in giving food its distinctive aroma and flavor, containing complete nutrients to meet the body's daily needs, having herbal properties thanks to its allicin content, and being effective as a pest and disease control agent for plants (Titisari et al., 2019). The diverse roles and benefits of garlic are felt in daily life, making it one of the strategic food commodities worthy of development in Indonesia.

Badan Pusat Statistik (2024) recorded that national garlic production in 2023 was only 39.25 thousand tons. Meanwhile, household consumption of garlic reached 552.48 thousand tons. This data shows that production was only able to meet 7.10% of total consumption. As a result of this low production, more than 90% (564.114 thousand tons) of national demand is met through imports, with China being the main source country for garlic imports. According to Pusat Sosial Ekonomi dan Kebijakan Pertanian (2019), one of the main challenges in developing garlic in Indonesia is the limited land available, which must compete with other agricultural commodities. This is in line with the findings of Shofiyah and Sugiarti (2020), who stated that the decline in garlic production has occurred since 1996 due to a reduction in harvest area, triggered by the influx of imported garlic from China, which is cheaper and of better quality, causing many farmers to switch to planting other commodities that are considered more profitable. This supply deficit poses a serious challenge and makes garlic one of the main commodities in national food self-sufficiency through the Upland Program.

The Upland Program is a highland commodity development program using foreign loan funds. This program aims to increase agricultural productivity in highlands and boost farmers' income. West Nusa Tenggara, known as one of Indonesia's largest garlic-producing provinces, has received government support through the Upland Program to become the only national garlic development center. The program began in 2021 and is scheduled for completion in 2025 in East Lombok Regency. This policy is expected to utilize land potential while addressing various garlic development issues. The program support in the form of government assistance and guidance provided includes: a) Production facilities such as garlic seeds, biofertilizers, NPK fertilizers, compost fertilizers, fungicides, insecticides, and plastic mulch, b) Infrastructure development through farm roads and irrigation, and c) Provision of agricultural machinery (Kementerian Pertanian, 2020).

Several studies of the Upland Program in Indonesia show that it can significantly increase farmers' incomes (Mahendra et al., 2022; Annisa et al., 2024). Other research findings regarding the sustainability of the program, Febrilia et al. (2025) suggest that the sustainability of the program in economic terms is moderate, while sustainability in social and ecological terms is high. In the context of garlic development in East Lombok, Danasari et al. (2022) found that farmers' response to the Upland Program in East Lombok was influenced by variables such as income, land area, and farming experience, while age and education had no significant effect on these activities. Furthermore, Febrilia et al. (2025) assessed the sustainability of garlic production in Sembalun District as good in the ecological and social dimensions, while the economic dimension was categorized as sufficient.

Most previous studies have focused more on economic analysis and the sustainability of the Upland Program's implementation. However, to date, no systematic study has assessed farmers' satisfaction with the quality of the program's services. Therefore, this study aims to evaluate the implementation of the garlic Upland program based on the perceptions and satisfaction of farmers as beneficiaries. One model for evaluating program performance is based on Input, Process, Output, and Outcome (Hsu et al, 2020; Gunawan et al., 2022; Juliwardi et al., 2019; Suklani, 2023).

Therefore, this study attempts to fill this gap by providing a different and more comprehensive analysis than previous studies because it is able to integrate service quality measurements, satisfaction levels, and program improvement priorities into a single evaluative analytical framework. This integration is realized through the analysis of Service Quality (SERVQUAL), Customer Satisfaction Index (CSI), and Importance Performance Analysis (IPA) in four main dimensions, namely Input, Process, Output, and Outcome. This study also accommodates the principles of sustainable agriculture in the question indicators, which have been modified to differentiate it from previous studies. The results of this study are expected to provide empirical contributions to the evaluation of beneficiary-based sustainable agricultural cultivation policies and serve as strategic considerations for the government in improving the effectiveness and sustainability of future programs.

2. Methods

This research was conducted from April to June 2025 in East Lombok Regency in three subdistricts, namely Sembalun, Suela, and Wanasaba. The locations were selected purposively because they are the main garlic-producing areas and have been designated as Upland development areas. This study used a quantitative approach with interviews and questionnaires distributed randomly to 68 of 90 farmer groups receiving assistance in 2024, based on Isaac and Michael's calculation with a 10% error rate (Sugiyono, 2013).

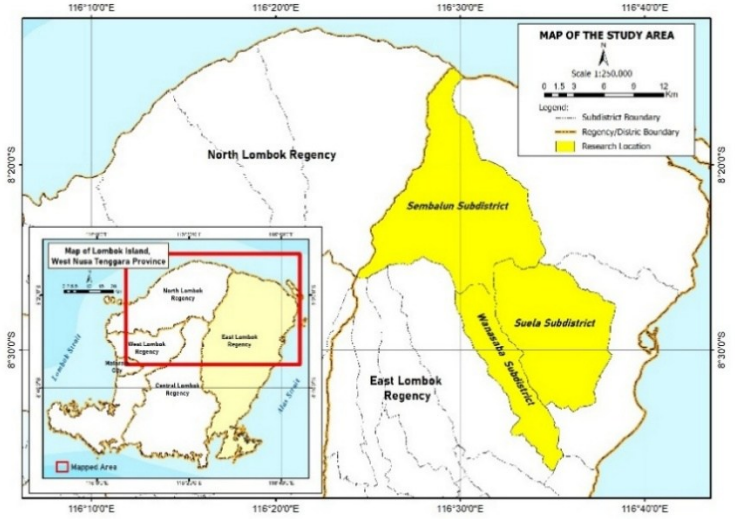

Figure 1. Research location map
Source: Author's Analysis, 2025

The questionnaire consisted of 4 dimensions (Input, Process, Output, Outcome) with 34 indicator questions (Table 1). The assessment of satisfaction levels with the Upland program was conducted by assigning scores between farmers' expectations and perceived performance using a Likert scale ranging from 1 to 4, where 1 indicates the lowest level, and 4 indicates the highest level, as interpreted in Table 2.

Table 1. Indicators in each dimension are used to evaluate the Upland program

No	Dimension		Indicators	Source
1	INPUT	1	There was a presentation on the Upland Garlic program.	Bathaei & Štreimikien, 2023; Gunawan et al., 2022; Pratama et al., 2024;
		2	There are instructions/guidelines for implementing the Upland Garlic program	Gunawan et al., 2022; Pratama et al., 2024; Shaleh et al., 2019
		3	Farmers are present and active in the socialization of the Upland Garlic program	Bathaei & Štreimikien, 2023; Gunawan et al., 2022; Pratama et al., 2024; Shaleh et al., 2019
2	PROCESS	4	Counseling and training are conducted before assistance is provided	Gunawan et al., 2022; Pratama et al., 2024; Shaleh et al., 2019
		5	Extension workers check the Upland Garlic program assistance provided	Gunawan et al., 2022; Pratama et al., 2024; Shaleh et al., 2019
		6	Village facilitators check the Upland Garlic program assistance provided	Kepdirjen PSP No 34 Tahun 2020; Pratama et al., 2024
		7	Extension workers participate in the distribution of assistance for the Upland Garlic farmer group program	Gunawan et al., 2022; Pratama et al., 2024; Shaleh et al., 2019
		8	Village facilitators participate in the distribution of assistance for the Upland Garlic farmer group program	Kepdirjen PSP No 34 Tahun 2020; Pratama et al., 2024
		9	Extension workers often conduct monitoring, evaluation, and assist farmers receiving assistance with their problems	Gunawan et al., 2022; Pratama et al., 2024; Shaleh et al., 2019

No	Dimension		Indicators	Source
		10	Village facilitators often conduct monitoring and evaluation, as well as assist farmers with their problems.	Kepdirjen PSP No 34 Tahun 2020; Pratama et al., 2024
		11	The amount of seeds and fertilizers is sufficient for the field requirements	Gunawan et al., 2022
		12	Seed varieties are in line with farmers' preferences	Gunawan et al., 2022; Pratama et al., 2024; Shaleh et al., 2019
		13	Seed quality meets farmers' expectations	Mucharam et al., 2022; Pratama et al., 2024; Pratama et al., 2024
		14	Seeds and fertilizers arrived on time	Gunawan et al., 2022
		15	Seeds planted according to the planting season	Pratama et al., 2024
		16	Farmers practice good soil preparation before planting	Mucharam et al., 2022; Pratama et al., 2024
		17	Farmers use organic fertilizer according to dosage/recommendations	Fatimah, 2020; Mucharam et al., 2022; Pratama et al., 2024
		18	Farmers use inorganic fertilizers according to dosage/recommendations	Fatimah, 2020; Mucharam et al., 2022; Pratama et al., 2024
		19	Farmers control pests and plant diseases with chemicals according to dosage/recommendations	Mucharam et al., 2022; Pratama et al., 2024
		20	Farmers utilize natural materials for pest and disease control	Mucharam et al., 2022; Pratama et al., 2024
3	OUTPUT	21	There was an increase in production after receiving assistance from the Upland Garlic program.	Gunawan et al., 2022; Mucharam et al., 2022; Shaleh et al., 2019
		22	There was an increase in planting area after receiving assistance from the Upland Garlic program.	Gunawan et al., 2022; Shaleh et al., 2019
		23	There was an increase in productivity after receiving assistance from the Upland Garlic program.	Gunawan et al., 2022; Marita et al., 2021; Mucharam et al., 2022; Shaleh et al., 2019
		24	Farmer's income increased after participating in the Upland Garlic program	Gunawan et al., 2022; Mucharam et al., 2022; Pratama et al., 2024; Shaleh et al., 2019
		25	There is a reduction in agricultural production costs	Marita et al., 2021
		26	The market selling price is stable	Pratama et al., 2024
4	OUTCOME	27	The quality of garlic produced (harvest yield) is better	Marita et al., 2021
		28	Harvests can be a source of income for farmers	Marita et al., 2021; Mucharam et al., 2022
		29	Farmer's finances become stable	Marita et al., 2021; Mucharam et al., 2022
		30	Farmer's working conditions are improved through the provision of facilities and infrastructure	Marita et al., 2021; Mucharam et al., 2022
		31	Garlic farming has grown since the implementation of the Upland Garlic program.	Gunawan et al., 2022
		32	The farmer's interest in growing garlic increased after participating in the Upland Garlic program.	Gunawan et al., 2022; Li et al., 2025; Shaleh et al., 2019
		33	Willing to grow garlic independently, even though the Upland Garlic program has ended	Li et al., 2025; Pratama et al., 2024
		34	Achievement of environmental sustainability	Bathaei & Štreimikien, 2023; Marita et al., 2021; Mucharam et al., 2022

Sources: various studies and research

Table 2. Interpretation of performance and expectation scales

Skor	***Importance*** **(Y)**	***Performance*** **(X)**
1	Not important at all	Very dissatisfied
2	Not important	Dissatisfied
3	Important	Satisfied
4	Very important	Very satisfied

Source: Nuraina et al. (2022)

Before the questionnaire was used, validity and reliability tests were conducted first. The validity test aims to assess the extent to which a question item is able to accurately and precisely represent the

variable being studied. Meanwhile, the reliability test is used to measure the consistency or reliability of the questions in describing the research variable (Kurniawan and Puspitaningtyas, 2016; Karnia, 2024). The higher the Cronbach's Alpha coefficient value, the more stable and reliable the data produced. Basically, when data is reliable and objective, it is generally valid (Sugiyono, 2013). The Cronbach's Alpha coefficient values of the study and their interpretations are presented in Table 3.

Table 3. Classification of Cronbach's Alpha Coefficient

Cronbach's Alpha Coefficient	Interpretation of Cronbach's Alpha Coefficient
$\alpha \geq 0.9$	The internal consistency of the scale is high
$0.7 \leq \alpha < 0.9$	The scale has internal consistency
$0.6 \leq \alpha < 0.7$	The internal consistency of the scale is acceptable
$0.5 \leq \alpha < 0.6$	The internal consistency of the scale is weak,
$\alpha < 0.5$	The scale has no internal consistency

Sumber: Sürücü dan Maşlakçı (2020)

The next step is to analyze the data using Service Quality (SERVQUAL). Service quality analysis was developed by Parasuraman et al (1985) to assess service quality by comparing the services received by the community with the ideal services they expect. The difference between perceived service performance and expected service is referred to as the "gap" or a reflection of service quality (Yahya et al., 2023). This analysis has the advantage of providing a direct view from the perspective of service recipients and helping organizations identify areas where they may need to improve service quality as a basis for strategic improvement (Pramana & Suparto, 2024). However, unlike the quality of goods, which can be measured objectively (Garvin, 1983, in Findlay and Sparks, 2002), subjective assessments are one of the limitations of this analysis. Furthermore, it is not entirely relevant to all types of industries or services and has limitations in describing the dynamics of changes in service recipients' perceptions over time (Pramana & Suparto, 2024).

Then it was followed by a CSI analysis. The Customer Satisfaction Index (CSI) serves as a comprehensive framework for measuring and analyzing the level of service user perception, helping organizations identify areas for improvement and ultimately improving organizational performance (Wardhana, 2024). This method has several advantages, including efficiency (not only measuring satisfaction but also obtaining information related to the dimensions/attributes being improved), ease of use and simplicity, and the use of a scale with high sensitivity and reliability (Anggraini et al., 2015).

The CSI value is determined through the following steps (Chanifah et al., 2021):

1. Mean Importance Score (MIS) is the value of the average of each importance indicator
2. Mean Satisfaction Score (MSS) is the value of the average of each performance indicator
3. Weighted factor (WF) is the weight of the MIS value percentage per attribute against the total MIS of all attributes.
4. Weighted score (WS) is the multiplication between the WF of each attribute and the average satisfaction level per attribute (MSS)
5. Weight Total (WT) is the sum of the weighted scores (WS) of all attributes
6. Customer satisfaction index (CSI) or customer satisfaction level is the WT value divided by the maximum scale used and then multiplied by 100%. The measurement values of farmer satisfaction in the study are detailed in Table 4.

Table 4. Interpretation of farmer satisfaction index (CSI) figures

Index Value	Interpretation
$75\% \leq CSI \leq 100\%$	Very satisfied
$50\% \leq CSI \leq 74$	Satisfied
$25\% \leq CSI \leq 49$	Not satisfied
$0\% \leq CSI \leq 24$	Very dissatisfied

Source: Nuraina et al. (2022)

Finally, the analysis results will be processed using the Importance Performance Analysis method. Quadrant analysis is a descriptive analysis first presented in 1977 by John A. Martilla and John James, also

known as Important Performance Analysis (IPA). Initially, this method became a very popular managerial tool for organizational performance development in the fields of marketing research and consumer behavior. However, it has now developed into various types of research studies because this method can help in identifying customer/service user expectations, evaluating satisfaction, determining the focus of service/product improvement, and formulating strategies to increase effectiveness (Shaikh et al., 2023), such as in the fields of agriculture (Park & Shin, 2023), environment (Lee, 2019), health (Cohen et al., 2016), sustainable development (Shi & Yang, 2022), and forestry (Chen et al., 2021). The advantages of the IPA method lie in its simple procedure, easily interpretable results, low cost, ability to respond quickly and appropriately to consumer dissatisfaction, ensuring that services meet expectations, facilitating policymakers in setting priorities when resources are limited, and having the flexibility to be applied in various fields (Hu & Salim, 2023; Wahyuningrum et al., 2023).

The IPA matrix is traditionally divided into four quadrants, namely: (A) Concentrate Here (Quadrant I), which is the area that needs immediate improvement; (B) Keep Up the Good Work (Quadrant 2), which shows the aspects where respondents are already satisfied and need to maintain consistent performance; (C) Low Priority (Quadrant III), referring to factors that are considered less important by customers and therefore do not require much improvement effort; and (D) Possible Overkill (Quadrant IV), describing elements where the organization puts excessive effort into aspects that are not really considered important by respondents (Shaikh et al., 2023).

3. Results and Discussions

3.1 Validity Test Result

Based on a significance level of 5% with a sample size (n) = 68, the R-table value obtained was 0.2387. According to Amanda Livia et al. (2019), an instrument or question is significantly correlated with the total score (valid) if the calculated $r_{\text{-value}} > r_{\text{-table}}$. The results of the validity test for importance and performance in Table 5 show that the correlation of each indicator with the total score of each variable is greater than 0.2387. Therefore, the research instrument/questionnaire can be considered valid and suitable for use.

Table 5. Results of the validity test for performance level and importance

No	Dimension		Indicator	Calculated-R		R-table	Key
				Expectation (X)	Performance (Y)		
1	INPUT	1	There was a presentation on the Upland Garlic program.	0.76	0.66	0.2387	Valid
		2	There are instructions/guidelines for implementing the Upland Garlic program	0.52	0.52	0.2387	Valid
		3	Farmers are present and active in the socialization of the Upland Garlic program	0.65	0.52	0.2387	Valid
2	PROCESS	4	Counseling and training are conducted before assistance is provided	0.64	0.55	0.2387	Valid
		5	Extension workers check the Upland Garlic program assistance provided	0.24	0.47	0.2387	Valid
		6	Village facilitators check the Upland Garlic program assistance provided	0.59	0.50	0.2387	Valid
		7	Extension workers participate in the distribution of assistance for the Upland Garlic farmer group program	0.27	0.60	0.2387	Valid
		8	Village facilitators participate in the distribution of assistance for the Upland Garlic farmer group program	0.70	0.69	0.2387	Valid
		9	Extension workers often conduct monitoring, evaluation, and assist farmers receiving assistance with their problems	0.25	0.64	0.2387	Valid
		10	Village facilitators often conduct monitoring and evaluation, as well as assist farmers with their problems.	0.68	0.71	0.2387	Valid
		11	The amount of seeds and fertilizers is sufficient for the field requirements	0.52	0.48	0.2387	Valid

No	Dimension		Indicator	Calculated-R		R-table	Key
				Expectation (X)	Performance (Y)		
		12	Seed varieties are in line with farmers' preferences	0.65	0.80	0.2387	Valid
		13	Seed quality meets farmers' expectations	0.62	0.78	0.2387	Valid
		14	Seeds and fertilizers arrived on time	0.65	0.74	0.2387	Valid
		15	Seeds planted according to the planting season	0.64	0.72	0.2387	Valid
		16	Farmers practice good soil preparation before planting	0.68	0.55	0.2387	Valid
		17	Farmers use organic fertilizer according to dosage/recommendations	0.70	0.60	0.2387	Valid
		18	Farmers use inorganic fertilizers according to dosage/recommendations	0.57	0.50	0.2387	Valid
		19	Farmers control pests and plant diseases with chemicals according to dosage/recommendations	0.32	0.40	0.2387	Valid
		20	Farmers utilize natural materials for pest and disease control	0.70	0.59	0.2387	Valid
3	OUTPUT	21	There was an increase in production after receiving assistance from the Upland Garlic program.	0.67	0.79	0.2387	Valid
		22	There was an increase in planting area after receiving assistance from the Upland Garlic program.	0.63	0.56	0.2387	Valid
		23	There was an increase in productivity after receiving assistance from the Upland Garlic program.	0.86	0.83	0.2387	Valid
		24	Farmer's income increased after participating in the Upland Garlic program	0.84	0.79	0.2387	Valid
		25	There is a reduction in agricultural production costs	0.56	0.48	0.2387	Valid
		26	The market selling price is stable	0.44	0.60	0.2387	Valid
4	OUTCOME	27	The quality of garlic produced (harvest yield) is better	0.77	0.77	0.2387	Valid
		28	Harvests can be a source of income for farmers	0.69	0.63	0.2387	Valid
		29	Farmer's finances become stable	0.51	0.55	0.2387	Valid
		30	Farmer's working conditions are improved through the provision of facilities and infrastructure	0.63	0.55	0.2387	Valid
		31	Garlic farming has grown since the implementation of the Upland Garlic program.	0.74	0.66	0.2387	Valid
		32	The farmer's interest in growing garlic increased after participating in the Upland Garlic program.	0.70	0.77	0.2387	Valid
		33	Willing to grow garlic independently, even though the Upland Garlic program has ended	0.68	0.69	0.2387	Valid
		34	Achievement of environmental sustainability	0.65	0.60	0.2387	Valid

Source: Author's Analysis, 2025

3.2 Reliability Test Result

Reliability testing was conducted to determine the reliability (level of confidence) of an item in measuring the variable under study. Table 6 shows the results of the reliability test with a value of 0.946 and performance reliability with a value of 0.951. According to Sürücü & Maslakçı (2020), the questions in the research instrument are reliable and have a high level of consistency with a Cronbach's Alpha value

≥ 0.9. In line with Amanda Livia et al. (2019), a variable is said to be reliable if the Cronbach's Alpha value is > 0.60.

Table 6. Reliability test results

Variable	Cronbach's Alpha Value	Number of items	Description
Importance	0.946	34	Reliable
Performance	0.951	34	Reliable

Source: Author's Analysis, 2025

3.3 Farmer's Satisfaction Level with the Upland Garlic Program in East Lombok Regency Through Sustainable Cultivation Practices

The level of farmer satisfaction in East Lombok Regency was evaluated using the Service Quality (Servqua) and Customer Satisfaction Index (CSI) methods to measure their perceptions and feedback to the performance of the Upland program. The calculation of the overall level of farmer satisfaction and the gap analysis for each indicator are presented in Table 7. Furthermore, Table 8 shows the results of the gap analysis calculation for each dimension. Based on the results of the analysis in Table 6, a CSI value of 79.66% was obtained. According to Nuraina et al. (2022), this value is in the range of 75% ≤ CSI ≤ 100%, which means that the level of farmer satisfaction with the Upland Program is in the very satisfied category.

Table 7. Overall results of the *Customer Satisfaction Index* (CSI) and Service Quality (Servqual) calculations

Indicator	Means Important Score (MIS)	Means Satisfaction Score (MSS)	Level of Conformity	GAP (MIS-MSS)	(Weight Factor) WF	(Weight Score) WS
1	3.26	3.16	96.85%	-0.10	3.00	9.47
2	3.25	3.26	100.45%	0.01	2.98	9.74
3	3.28	3.32	101.35%	0.04	3.01	10.00
4	3.29	3.28	99.55%	-0.01	3.02	9.91
5	3.22	3.19	99.09%	-0.03	2.96	9.43
6	3.32	3.31	99.56%	-0.01	3.05	10.09
7	3.15	3.25	103.27%	0.10	2.89	9.39
8	3.25	3.29	101.36%	0.04	2.98	9.82
9	3.21	3.15	98.17%	-0.06	2.94	9.26
10	3.26	3.28	100.45%	0.01	3.00	9.82
11	3.09	2.99	96.67%	-0.10	2.83	8.46
12	3.25	3.18	97.74%	-0.07	2.98	9.47
13	3.21	3.10	96.79%	-0.10	2.94	9.13
14	3.21	3.07	95.87%	-0.13	2.94	9.04
15	3.19	3.13	98.16%	-0.06	2.93	9.17
16	3.24	3.37	104.09%	0.13	2.97	10.00
17	3.31	3.32	100.44%	0.01	3.04	10.09
18	3.25	3.32	102.26%	0.07	2.98	9.91
19	2.91	2.96	101.52%	0.04	2.67	7.90
20	3.19	3.29	103.23%	0.10	2.93	9.65
21	3.26	3.24	99.10%	-0.03	3.00	9.69
22	3.06	2.99	97.60%	-0.07	2.81	8.38
23	3.22	3.24	100.46%	0.01	2.96	9.56
24	3.26	3.29	100.90%	0.03	3.00	9.87
25	3.31	3.41	103.11%	0.10	3.04	10.36

Indicator	Means Important Score (MIS)	Means Satisfaction Score (MSS)	Level of Conformity	GAP (MIS-MSS)	(Weight Factor) WF	(Weight Score) WS
26	3.21	2.69	83.94%	-0.51	2.94	7.92
27	3.24	3.19	98.64%	-0.04	2.97	9.47
28	3.10	3.09	99.53%	-0.01	2.85	8.79
29	2.99	2.91	97.54%	-0.07	2.74	7.98
30	3.19	3.25	101.84%	0.06	2.93	9.52
31	3.22	3.18	98.63%	-0.04	2.96	9.39
32	3.24	3.19	98.64%	-0.04	2.97	9.47
33	3.24	3.21	99.09%	-0.03	2.97	9.52
34	3.10	3.15	101.42%	0.04	2.85	8.96
TOTAL					Weight Total	318.65
					CSI	79.66

Source: Author's Analysis, 2025

Table 8. Results of Service Quality calculations for each dimension

No	Dimension	MIS	MSS	Gap
1	Input	3.26	3.25	-0.01
2	Process	3.21	3.21	0.00
3	Output	3.22	3.14	-0.08
4	Outcome	3.16	3.15	-0.02

Source: Author's Analysis, 2025

3.3.1 Service Quality

The results of the gap analysis for the four dimensions (Table 8) show that three dimensions have negative gap values, namely the Input (-0.01), Output (-0.08), and Outcome (-0.02) dimensions, indicating that the program's performance in these three dimensions has not met farmers' expectations. Meanwhile, the process dimension shows a neutral gap value (0.00), which means that farmers' perceptions of performance and expectations are relatively balanced, meaning that they have met farmers' expectations.

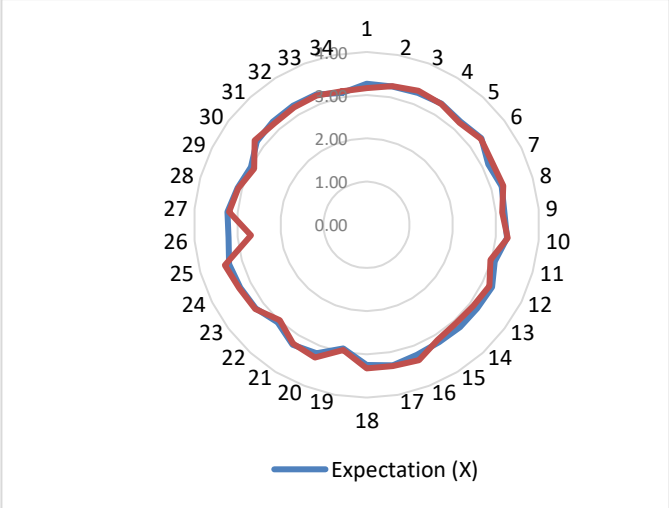

Figure 2. Visualization of the gap value for each indicator
Source: Author's Analysis, 2025

Furthermore, the overall analysis of the 34 indicators in Table 6 shows that there are 15 indicators with positive gap values, where the performance line (Y) is above the expectation line (X) as shown in Figure 1. This indicates that performance in these aspects has exceeded farmers' expectations and should be maintained. The indicator with the largest positive gap value is Indicator 16 (Farmers prepare the soil well before planting) with a value of 0.16. Conversely, 19 indicators have negative gap values, where the performance line (Y) is below the expectation line (X) as shown in Figure 1. This indicates that performance on these indicators is considered to have not met farmers' expectations. The largest negative gap value was found in Indicator 26 (Stable market selling price) with a value of -0.51, followed by Indicator 14 (Seeds and production facilities arrive on time) with a value of -0.13. According to Parasuraman et al. (1985) in Pratiwi & Putra (2022), the service provided is still in the good category if the gap is less than 1. However, an in-depth study of the indicators showing negative gap values needs to be conducted as a basis for formulating more targeted improvement strategies, increasing program effectiveness, and strengthening farmers' trust in government policies in the agricultural sector.

Input Dimensions

In terms of Input, there is one of three indicators that has not met farmers' expectations, namely Indicator 1 (There is dissemination of information about the Upland program), with a gap value of -0.10. However, the average performance score is still satisfactory (3.16). According to facts in the field, some farmers were initially unaware of this program and received information from other farmer groups. In addition, the dissemination of information by the head of the farmer group or representative of the farmer group resulted in limited access, as not all group members had the same understanding of the objectives, mechanisms, and procedures for utilizing the assistance. The dissemination of information about the program should be the first step in starting a government program because it plays an important role in ensuring that the program runs according to its objectives and provides optimal benefits for farmers. Through socialization, farmers obtain clear information about the objectives, mechanisms, and procedures for utilizing assistance, thereby increasing their understanding and readiness in managing the production facilities they receive. In line with Li et al (2024), socialization not only plays a role in promoting policy implementation but can also increase understanding of technology adoption and agricultural production.

Process Dimension

This dimension covers all technical stages of the program. There are 9 out of 17 indicators in the Process dimension that have not met farmers' expectations. Before aid is distributed and farmers start cultivation, extension and training must be carried out first. The analysis shows that the performance of Indicator 4 (extension and training conducted before assistance is provided) has not met farmers' expectations, with a gap value of -0.01. Eyitayo Raji et al. (2024) state that extension and training are the foundation for improving agricultural practices. Through extension and training, farmers acquire the knowledge necessary to make informed decisions, implement innovative techniques, and improve agricultural business management.

The next indicator is that farmers consider the monitoring of the Upland Garlic program assistance to be unsatisfactory, whether it is carried out by agricultural extension workers (Indicator 5; gap -0.03) or village facilitators (Indicator 6; gap -0.01). This is because agricultural extension workers and village facilitators only focus on the quantity distributed, but neglect the quality of seeds and production facilities. The role of extension workers in carrying out monitoring, evaluation, and assisting farmers with problems (Indicator 9; gap -0.06) also does not meet farmers' expectations. An evaluation of extension workers is needed to examine the shortcomings and strengths in program implementation, as well as to measure the program's success rate through dialogue with farmers (Prasetyo et al., 2020). In reality, farmers feel that extension workers are not sufficiently present in their groups. A similar point is made by Hamadal et al. (2024), who note that the role of extension agencies as service providers has been fulfilled, but the implementation by extension workers is still not optimal. This is evident from the fact that there are still complaints and problems among farmers that have not been fully facilitated or addressed by extension workers.

The amount of seeds and means of production (Indicator 11), seed varieties (Indicator 12), and seed quality (Indicator 13) are very important because they are fundamental in determining productivity and

crop yields. In reality, many farmers receive seeds that do not match the varieties and quality they want. In agricultural production systems, quality seeds are combined with other inputs to achieve the expected production output (Thakur and Kumari, 2020). Abebaw et al. (2023) reported that quality seeds in the right amount and at the right time are estimated to contribute directly to total production by 15–20%, depending on the type of crop, and this contribution can increase to 45% if other inputs are managed efficiently. In addition, farmers are dissatisfied with the distribution of production facilities. Although the amount received by each group is in line with the needs per planting area, farmers find it difficult to distribute production facilities internally among individual farmers.

Indicator 14 (timeliness of aid delivery) is also often a problem in several agricultural aid programs (Gunawan et al. 2022, Hermawan et al., 2025; Pakpahan & Manihuruk, 2025). The complexity of the process of determining Prospective Farmers and Prospective Locations (CPCL), which takes a long time, has an impact on the procurement process for assistance. This condition causes delays in the distribution of seeds and production facilities. This then has implications for Indicator 15 (seeds planted according to the planting season), where farmers miss the optimal planting season schedule. This can reduce farming efficiency, as farmers lose the opportunity to take advantage of the best agroclimatic conditions. Therefore, the effectiveness of agricultural assistance programs is not only determined by quantity but also by the timeliness of distribution. The integration of distribution management theory and the practical implementation of timely distribution (of seeds and production inputs) is crucial in formulating effective and sustainable agricultural policies.

Output Dimension

Farmer's dissatisfaction with Indicators 11, 12, 13, 14, and 15 has a negative impact on 3 of the 6 Output indicators, namely Indicator 21 (increase in production) with a gap value of -0.01, Indicator 22 (increase in planting area) with a gap value of -0.07), and Indicator 27 in the Output dimension (better quality of garlic produced), where according to farmers, the quantity and quality of garlic production did not meet their expectations. In some farmer groups, planting was not even carried out due to delays in the arrival of seeds and production facilities. Previous studies confirm that harvest yields are not significantly affected by earlier planting but are significantly reduced due to delayed planting (Dadrasi et al., 2024; Potter et al., 2025).

Indicator 26 (Selling price) is the indicator with the highest negative gap analysis (-0.51). Dissatisfaction with selling prices is caused by the instability of garlic prices and the tendency of farmers to immediately sell their harvest to middlemen due to cash needs or limited storage facilities. The inability to delay the sale of their harvest prevents farmers from taking advantage of higher prices at other times, so they often receive low prices, especially during the peak harvest season. In fact, from the perspective of farmers as primary producers, the selling price serves as an economic incentive that influences their decision to continue planting or switch to other commodities (Puspitasari et al., 2024). The price of garlic at the consumer level serves as an important indicator for farmers in determining the expansion of their planting area. When prices increase, farmers tend to respond by increasing the area planted with garlic. This increase in planting area ultimately has a positive impact on farmers' income (Zainuddin et al., 2022). However, this is the opposite when viewed from the consumer's perspective. Noviaranti & Zainuddin (2023) state that fluctuations in consumer prices of garlic play an important role in determining market demand, where an increase in garlic prices has been proven to have a negative impact on consumption behavior, causing consumers to respond by reducing the amount of garlic they buy.

Outcome Dimension

The inability of farmers to sell their crops at stable and profitable prices has resulted in low incomes, meaning that farmers' households are unable to meet their basic needs. This situation reflects the loss of farmers' main source of income (Indicator 28; gap -0.01). Insufficient income directly disrupts the financial stability of farming households (Indicator 29; gap -0.07). This leads to the perception among farmers that the Upland Garlic program is unable to develop the garlic farming business (Indicator 31, gap -0.04). A further impact of this condition is a decline in farmers' expectations in developing garlic farming businesses (Indicator 32, gap -0.04) and their desire to grow garlic independently even after the Upland

Garlic program ends (Indicator 33). In line with Danasari et al. (2022), an increase in farmers' income is directly proportional to their level of participation in garlic development activities.

3.3.2 Customer Satisfaction Index (CSI)

The results of the Customer Satisfaction Index (CSI) calculation in Table 6 show that the level of farmer satisfaction with the upland garlic program in East Lombok Regency is 79.66%. This value falls within the range of 75% - 100%, which is categorized as very satisfied with the performance of the upland program. In addition, this program also contributes to the implementation of sustainable agriculture. According to ESCAP (2009), in Situmorang (2022), sustainable agriculture integrates the goals of environmental health, economic benefits, and social sustainability to meet current food needs without neglecting the rights of future generations. This is reflected in good and proper cultivation practices, with farmers practicing good soil management (Indicator 16; gap 0.13), using organic fertilizers as recommended (Indicator 17; gap 0.01), using inorganic fertilizers as recommended (Indicator 18; gap 0.07), and controlling pests with natural materials (Indicator 20; gap 0.10). Economically, it can increase farmers' income (Indicator 24; gap 0.03) and reduce production costs (Indicator 25; gap 0.10), as well as promote social sustainability through improved working conditions for farmers (Indicator 30; gap 0.06).

3.3.3 Importance-Performance Analysis (IPA)

Although the Customer Satisfaction Index results show that farmers are very satisfied with the Upland Program, it is important for program managers to continue to develop strategies for continuous service improvement. Importance Performance Analysis (IPA) is an effective evaluative tool for determining priority aspects that need to be improved in order to maintain and increase farmer satisfaction levels in the future. This analysis groups indicators into a Cartesian diagram with an intersection at point (X, Y = 3.21,3.18) as shown in Figure 3. Red indicators represent the Input dimension, blue indicators represent the Process dimension, yellow indicators represent the Output dimension, and green indicators represent the Outcome dimension.

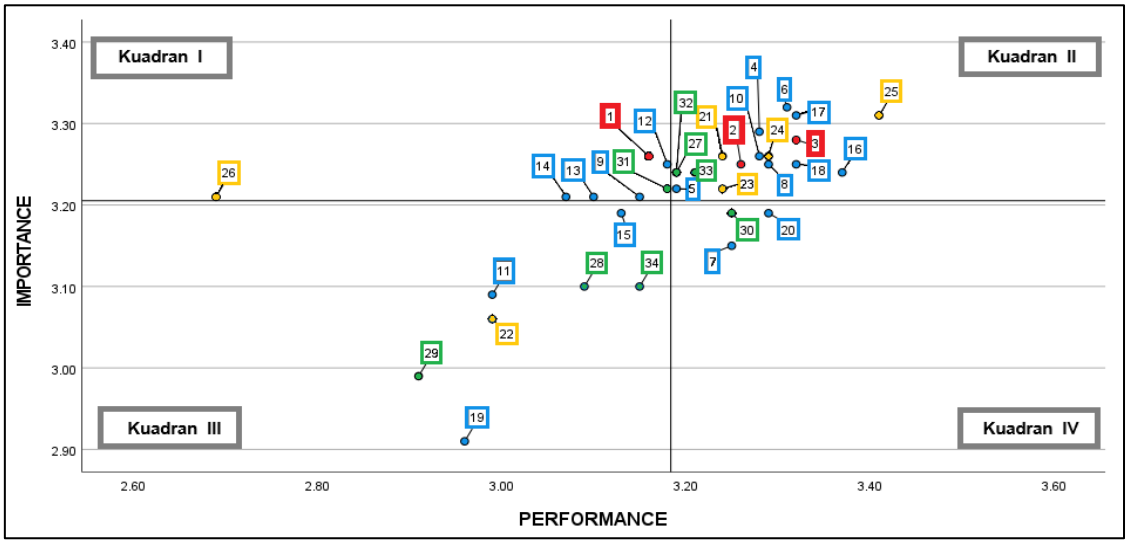

Figure 3. Cartesian diagram of IPA analysis
Source: Author's Analysis, 2025

According to Rayyani & Silfianti (2020), the concept of managerial strategy in quadrant I is to improve indicators that are considered important by farmers but whose implementation has not been optimal, making this quadrant a top priority for service improvement. The Cartesian diagram of the IPA analysis results in Figure 2 shows that there are seven indicators out of 34 indicators that fall into Quadrant I. The indicators used in the formulation of strategies for service improvement of the program are shown in Table 9.

Table 9. Results of the IPA analysis in Quadrant I

Dimension		Indicators
INPUT	1	There was a presentation on the Upland Garlic program
PROCESS	9	Extension workers often conduct monitoring, evaluation, and assist farmers receiving assistance with their problems
	12	Seed varieties are in line with farmers' preferences
	13	Seed quality meets farmers' expectations
	14	Seeds and fertilizers arrived on time
OUTPUT	26	The market selling price is stable
OUTCOME	31	Garlic farming has grown since the implementation of the Upland Garlic program

Source: Author's Analysis, 2025

These findings indicate that service improvement strategies should focus on distribution effectiveness, time management, and strengthening the garlic value chain. The IPA analysis also shows that the success of the program depends not only on the provision of production assistance but also on coordination, communication, and market intervention.

Conclusion

The Upland Program is one of the government's strategic efforts to achieve national garlic self-sufficiency by increasing productivity in highland areas. The success of this program is determined not only by the achievement of production targets, but also by the level of satisfaction of farmers as beneficiaries, which reflects the effectiveness of program implementation in the field. Based on the research conducted, the Servqual analysis shows that 19 of the 34 indicators are considered unsatisfactory because the performance is perceived to be below farmers' expectations. However, overall, it is concluded that farmers are very satisfied with the performance of the Upland garlic program, with a CSI score of 79.66%. Nevertheless, efforts are still needed to increase farmer satisfaction to 100% in the future

The IPA analysis results place seven key indicators in Quadrant I (priority for improvement), which form the basis for formulating strategies to improve program services, namely through improvements in the following indicators: Stable market prices (indicator 26), Seeds and agricultural inputs arrive on time (indicator 14), Seed quality is in line with farmers' expectations (indicator 13), Provision of information about the Upland program (indicator 1), Seed varieties are in line with farmers' preferences (indicator 12), Extension workers frequently conduct monitoring, evaluation, and assist farmers receiving assistance with their problems (indicator 9), and Garlic farming has grown since the implementation of the Upland program (indicator 31).

Limitations

Despite its contributions, this study has limitations due to the use of data based on farmers' own reports, which has the potential to cause subjective bias. Therefore, further research is recommended to combine quantitative methods with qualitative approaches, such as focus group discussions and in-depth interviews with technical implementing agencies, in order to enrich the results of a more comprehensive analysis of the program's effectiveness.

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