Agribusiness of Integrated Farming System Journal

The Effect of Farmers' Knowledge (*Capsicum sp.)* on Increased Production in Cilangkap Village, Lengkong Subdistrict

Encep Momon
Balai Penyuluh Pertanian (BPP) Lengkong
Indonesia

Article Information

Article History:

Received: August 03, 2026
Revised: September 24, 2026
Accepted: October 31, 2026

Keywords:

Farmers' knowledge
Chili pepper production
Chili farming
Simple linear regression.

Abstract

This study aims to analyze the effect of farmers' knowledge levels on chili pepper production in Cilangkap Village, Lengkong Subdistrict, Sukabumi Regency.
Methodology: The study employed a quantitative approach using a survey method involving 30 chili pepper farmers selected through a census technique. Data were collected through observation, interviews, and questionnaires. Data analysis included descriptive analysis to measure farmers' knowledge levels and simple linear regression analysis to test the effect of farmers' knowledge on chili pepper production.
Main Findings: The results showed that farmers' knowledge levels were in the high category, with a Farmer Knowledge Level Index (ITPP) of 71.03%. The results of the simple linear regression analysis showed that farmers' knowledge had a positive and significant effect on chili pepper production, with *a* calculated *t-value* of 5.133 greater than the critical t-value of 2.048 and a significance level of 0.000 (<0.05). The coefficient of determination (R^2) of 0.484 indicates that 48.4% of the variation in chili pepper production can be explained by farmers' knowledge levels, while 51.6% is influenced by other factors outside the research model.
Originality of This Study: This study provides empirical evidence regarding the effect of farmers' knowledge levels on chili pepper production at the farm level in Cilangkap Village and serves as scientific information for the development of extension programs and capacity building for farmers to support increased chili pepper productivity.

To cite this article: Momon. (2026). The Effect of Farmers' Knowledge (*Capsicum sp.)* on Increased Production in Cilangkap Village, Lengkong Subdistrict. *Journal of Agribusiness and Integrated Farming Systems, 1* (3), 101-112.

This article is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License ©2026 by the author(s)

INTRODUCTION

Research Background:
The agricultural sector plays a crucial role in the national economy, not only as the primary food provider but also as a pillar of macroeconomic stability and a source of livelihood for the majority of people in developing countries (Abror et al., 2026). One horticultural commodity with high economic value and very strong market appeal is the chili pepper (*Capsicum sp.*). Market demand for chili peppers—both for household consumption and as raw materials for the food processing industry—has continued to rise year after year. However, the highly volatile nature of chili peppers, their perishability, and their extreme vulnerability to changes in environmental conditions often lead to supply uncertainties that result in price spikes in the domestic market (Wijayanti, 2025) .
Traditionally, increases in crop yields have often been associated exclusively with land expansion (*extensification*) or the modernization of physical inputs, such as the use of high doses of chemical fertilizers and high-yielding seed varieties (Saidah et al., 2024) . Although these physical factors make

*** Corresponding author:**
Encep Momon, Balai Penyuluh Pertanian (BPP) Lengkong, Indonesia. ✉ encepmomon455@gmail.com

a significant contribution, the crop failures that frequently plague chili farmers in various regions indicate the existence of another neglected dimension: the intellectual and managerial capacity of the farmers themselves. Chili peppers are characterized as a commodity that is highly sensitive to environmental stress, weather fluctuations, and attacks by plant pests and diseases. Therefore, successful chili cultivation requires specialized expertise and an adequate level of technical knowledge from farmers as the primary decision-makers on the farm (*on-farm decision makers*).

Farmers' level of knowledge essentially serves as *human capital* that determines the efficiency of the allocation of all production inputs used. In accordance with the theory of technical efficiency, farmers with well-developed cognitive capacities are able to process modern agricultural information rationally, calculate balanced application rates for generative fertilizers, and apply the principles of Integrated Pest Management (IPM) with precision (Limi et al., 2025) . Limited knowledge forces farmers to act in a reactive and conventional manner—for example, by overusing chemical pesticides without regard for economic thresholds. This mismanagement not only drives up *production* costs but also accelerates pest resistance and reduces the physical quality of chili peppers at market.

Beyond technical aspects of cultivation, farmers' knowledge also plays a role in their ability to access market information, utilize technological innovations, and make sound agricultural business decisions. Farmers with a high level of knowledge tend to be more receptive to agricultural innovations, whether they come from extension workers, research institutions, or digital media. Conversely, a low level of knowledge leads to a slow technology adoption process, making it difficult for farm productivity to improve (Barokah & Jannah, 2025) . In actual farming practices in the field, there are still farmers who apply fertilizer based on traditional practices passed down through generations, use pesticides at doses that do not follow recommended guidelines, and manage plant pests without applying the principles of Integrated Pest Management (IPM). These conditions have the potential to increase production costs, reduce the efficiency of input use, and decrease the quality and quantity of the harvest (Ibrahim et al., 2025) .

Based on this background, this study aims to analyze the level of knowledge among chili farmers and to examine the effect of that knowledge on increasing chili production in Cilangkap Village, Lengkong Subdistrict, Sukabumi Regency. The results of this study are expected to serve as a basis for local governments and agricultural extension workers in formulating strategies to enhance farmers' capacity so that chili productivity can be increased sustainably.

Literature Review :

Farmers' knowledge is a form of *human capital* that plays a crucial role in enhancing farmers' ability to manage their agricultural operations effectively and efficiently. According to *Human Capital* theory, knowledge, skills, and experience are investments that can increase an individual's productivity in economic activities. In the agricultural sector, farmers' level of knowledge influences their ability to understand cultivation technologies, use production inputs, manage risks, and make appropriate decisions during the production process (Alindi et al., 2023) .

In chili farming, farmers' knowledge encompasses an understanding of selecting high-quality seeds, land preparation, planting techniques, balanced fertilization, irrigation, pest and disease control, the proper dosing of pesticides, and harvest and post-harvest handling (Jaya & Santoso, 2022) . Mastery of these aspects will improve the efficiency of input use, thereby enabling higher production at more manageable costs. According to the theory of innovation diffusion proposed by Rogers (2003), the successful adoption of an innovation is greatly influenced by an individual's level of knowledge. Farmers with greater knowledge tend to accept and implement agricultural innovations more quickly than those with lower levels of knowledge. The implementation of these innovations leads to increased productivity, farming efficiency, and the competitiveness of agricultural products.

Several studies indicate that farmers' knowledge has a positive relationship with agricultural productivity. Research conducted by Ragasa et al. (2020) shows that agricultural extension and capacity building for farmers can increase the adoption of cultivation technologies, thereby leading to higher production yields. Similarly, a study by Manda et al. (2021) states that farmers with higher levels of knowledge tend to apply cultivation technologies more effectively, thereby increasing the productivity of their land. Another study by Issahaku and Abdulai (2022) also found that knowledge and access to information are important factors in improving the technical efficiency of horticultural farming operations. Agricultural production is the end result of a combination of various production

factors, such as land, labor, capital, technology, and farmers' managerial skills. According to production function theory, increased production is influenced not only by additional physical inputs but also by the quality of the human resources managing those inputs. Therefore, farmers' knowledge plays a crucial role in determining the success of the production process. Based on this theoretical review, it can be understood that farmers' knowledge is a factor that can influence the success of chili farming through the application of cultivation techniques that are more appropriate, efficient, and in line with agricultural technology recommendations.

Gap Analysis :
Previous studies have generally focused their analysis on the influence of production factors—such as land area, seed use, fertilizers, pesticides, labor, and capital—on increasing chili pepper production. Meanwhile, research specifically examining the influence of farmers' knowledge—as a form of human capital—on increasing chili pepper production remains relatively limited, particularly at the village level. Results from previous studies indicate variations in the impact of knowledge on agricultural productivity across different regions. These differences are influenced by farmers' socioeconomic characteristics, educational levels, farming experience, the intensity of extension services, and the agroecological conditions of each region (Amelia et al., 2022) . Consequently, research findings from one region cannot necessarily be generalized to others.
In Cilangkap Village, Lengkong Subdistrict, little research has been conducted on the influence of farmers' knowledge on increasing chili pepper production. Yet this area is one of the major chili pepper cultivation centers in Sukabumi Regency, with a diverse farmer population. Therefore, this study aims to address this gap by empirically analyzing the influence of farmers' knowledge levels on increasing chili pepper production at the study site.

Research Rationale :
The success of chili farming is not only determined by the availability of production factors such as land, seeds, fertilizer, labor, and capital, but is also influenced by farmers' ability to manage all these production factors effectively. Farmers' knowledge serves as the foundation for decision-making throughout the cultivation process, from seed selection, land preparation, planting, fertilization, and pest and disease control, to harvesting and post-harvest activities.
Farmers with a high level of knowledge tend to be better able to apply cultivation technologies as recommended, use production inputs efficiently, anticipate attacks by plant pests and diseases, and utilize information from extension workers as well as advancements in agricultural technology. Conversely, a lack of knowledge can lead to mistakes in farm management, resulting in low productivity and increased production costs.

METHODS

Research Design :
This study was designed using a quantitative approach with an explanatory *research* method, aimed at testing a causal hypothesis regarding the influence of chili pepper (*Capsicum sp.*) farmers' knowledge levels on increased farm production. According to (Sugiyono, 2020) , data were collected through a *cross-sectional* field survey (data collection within a specific time period) using a structured questionnaire distributed directly to respondents at the study site.

Population and sampling method :
The population in this study consisted of all chili farmers (*Capsicum sp.*) actively cultivating chili in Cilangkap Village, Lengkong Subdistrict, Sukabumi Regency. Based on data from farmer groups and the Agricultural Extension Center (BPP), the chili farmer population totals 45 people**.** The sample was determined using the Simple Random Sampling technique, in which every member of the population has an equal chance of becoming a research respondent. The sample size was calculated using the Slovin formula (Sugiyono, 2020) :

$$\pi = \frac{N}{1+Ne^2}$$

Explanation:

- n = sample size
- N = population size
- e = margin of error (10%)

With a population of 45 farmers, the required sample size was approximately 31 respondents. However, based on respondent availability and the completeness of the research data, the number of respondents analyzed was 30 farmers, which still met the minimum number required for simple linear regression analysis.

Instrument :
The instrument used in this study was a closed-ended questionnaire designed based on indicators of farmers' knowledge regarding chili cultivation (*Capsicum sp.*). The measurement of the farmers' knowledge variable used a five-point Likert scale. The statements were developed from eight indicators: knowledge of the use of high-yielding seeds, land preparation, planting techniques, fertilization, irrigation, pest and disease control, pesticide use, and harvesting and postharvest handling. The chili pepper production variable was measured based on the amount of harvest obtained by farmers in a single growing season and expressed in kilograms (kg). The instrument was considered valid if the calculated *r* value was greater than the table *r* value at a 5% significance level, while the instrument was considered reliable if the Cronbach's Alpha value was greater than or equal to 0.70 (Sugiyono, 2020) .

Procedures and, if relevant, their timeframes :
The research was conducted in several stages. The first stage was a preliminary study to gather information on the conditions of chili farming in Cilangkap Village. The next stage involved developing the research instrument based on a literature review and the research variable indicators. The developed instrument was tested for validity and reliability before being used in data collection.
Primary data collection was conducted through face-to-face interviews using a questionnaire with 30 respondents selected as the research sample. In addition to primary data, the study also utilized secondary data obtained from the Central Statistics Agency (BPS), the Sukabumi Regency Agriculture Office, the Lengkong Subdistrict Agricultural Extension Office, and various relevant scientific literature.

Analysis Plan :
Data analysis was conducted using both descriptive and inferential methods. Descriptive analysis was used to describe the characteristics of the respondents, the farmers' level of knowledge, and chili production conditions.

Inferential analysis was conducted through the following stages:

1. Validity Test, conducted using the Pearson Product-Moment correlation
   ; the instrument is considered valid if:
   - Sig. < 0.05 or calculated *r* > table *r*
2. Reliability Test, conducted using Cronbach's Alpha
   Criteria:
   - $\rho \geq 0.70$ = reliable
3. Simple Linear Regression Analysis
   To determine the effect of farmers' knowledge on increased production, the following equation was used:
   $$\mathbf{Y = a + bX + e}$$

   Explanation:
   - Y = Chili pepper production

- a = Constant
- b = Regression coefficient
- X = Farmers' knowledge
- e = Error

4. T-test, used to determine the relationship between farmers' knowledge and chili pepper production; decision criteria:
   - Sig. < 0.05 or calculated t > table t, then H_0 is rejected.
   - Sig. > 0.05 or calculated t < table t, then H_0 is accepted.
5. Coefficient of Determination (R^2)
   The coefficient of determination is used to determine the extent to which farmers' knowledge contributes to explaining variations in chili pepper production.

Scope of Methodological Limitations :
This study only examines the effect of farmers' knowledge on increasing chili pepper production in Cilangkap Village, Lengkong Subdistrict, Sukabumi Regency. The independent variable is limited to the level of farmers' knowledge, while the dependent variable is chili pepper production during a single growing season. Other factors that could potentially influence production—such as land area, fertilizer use, labor, capital, climatic conditions, seed varieties, and farming experience—were not included in the research model and are therefore outside the scope of the analysis (Damayanti, 2013) . Therefore, the results of this study describe the effect of farmers' knowledge on chili pepper production at the study site and cannot be directly generalized to other regions with different characteristics.

RESULTS AND DISCUSSION

Results :

1. Respondent Characteristics

Respondent characteristics provide a general overview of the social and economic conditions of the study participants, including age, educational level, farming experience, cultivated land area, and the types of crops they have grown and are currently growing (Dewi et al., 2021) . These characteristics are presented to provide an understanding of the respondents' background as farmers and to serve as a basis for analyzing the influence of farmers' knowledge on the selection of chili as a crop.

a. Farmers' Age

Age is the span of life measured in years; generally, age influences human thought patterns. In this context, a farmer's age can influence decision-making; younger farmers are often better able to manage farming operations they have been engaged in for a long time. Farmers in their productive years typically work more effectively and efficiently compared to those who are no longer in their productive years.

Table 1. Age Groups of Farmers

No	Age (years)	Number (people)	Percentage (%)
1	25–35	8	22
2	36–45	12	33
3	46–55	10	28
4	56–65	6	17
	Total	30	100

Source: Processed primary data (2026)

As shown in Table 1, the majority of chili farmers in Cilangkap Village are between the ages of 36 and 45—12 people (33%)—who fall within the productive age group and possess sufficient physical ability and experience to manage chili farming operations and make rational business decisions. There are 10 farmers (28%) aged 46–55, reflecting considerable farming experience in dealing with

production risks and chili price fluctuations. Meanwhile, the 8 farmers (22%) aged 25–35 tend to be more open to agricultural innovations and information (Abdullah et al., 2023) , while the 56–65 age group is the smallest, comprising 6 people (17%), with their involvement beginning to decline due to diminishing physical capacity

b. Farming Experience

Farmers' development of their farming businesses is inevitably linked to their past experiences. Farming experience is a key factor in farmers' decision-making regarding farming activities. This experience is measured from the time farmers first began their farming operations. The distribution of farming experience is shown in Table 2 below:

Table 2. Levels of Farming Experience

No	Farming Experience	Number of (people)	Percentage (%)
1	1–10	10	33
2	11–20	12	40
3	21–30	8	27
	Total	30	100

Source: Processed primary data (2026)

Farming experience is one of the key factors influencing farmers' decision-making in agricultural activities. Farming experience affects farmers' decisions regarding the allocation of production factors, which in turn impacts agricultural productivity (Kadir et al., 2025) .

Table 2 shows that most farmers have 11–20 years of farming experience. This indicates that the majority of farmers have considerable experience in agriculture, which serves as a vital asset in decision-making.

c. Highest Level of Education

Generally, education can be categorized into formal and non-formal education. Formal education is a structured, tiered educational pathway consisting of elementary school, junior high school, senior high school, and higher education, while non-formal education refers to education received within the family and community, including training activities participated in within the community. In this study, the level of education measured is the formal education completed by farmers to assess their level of knowledge.

Table 3. Distribution of Highest Level of Education

No	Educational Level	Number (people)	Percentage (%)
1	Elementary School	13	43
2	Junior High School	10	33
3	High School	5	17
4	Bachelor's Degree	2	7
	Total	30	100

Source: Primary Data (2026)

Based on Table 3, most farmers in Cilangkap Village, Lengkong Subdistrict, have a relatively low level of education, with elementary and junior high school graduates making up the majority. This indicates that most farmers have a relatively low level of formal education.

d. Number of Family Dependents

Family dependents are the number of family members supported by the household. The distribution of the number of family dependents can be seen in Table 4 as follows:

Table 4. Distribution of Family Dependents

No	Family Dependents	Total (people)	Percentage (%)
1	2–3	12	40
2	4–5	13	43

No	Family Dependents	Total (people)	Percentage (%)
3	>6	5	17
	Total	30	100

Source: Primary Data (2026)

The number of dependents is one of the factors influencing farmers' decisions regarding their farming activities. Generally, family members counted as dependents can assist with labor. Based on the table above, the distribution of the number of family dependents shows that 12 respondents have 2–3 dependents, 13 respondents have 4–5 dependents, and 5 respondents have more than 6 dependents. It is noted that the largest number of family dependents is 4–5 (13 respondents), while the smallest number is more than 6 (5 respondents).

This indicates that the more productive family members a farming household has, the more additional labor is available. However, on the other hand, this can increase daily household expenses. In line with Kindangen & Walewa (2020), the size of the family's number of dependents affects income because the greater the number of dependents to feed, the more it indirectly compels the labor force to seek additional sources of income.

2. Farmers' Level of Knowledge

The total farmer knowledge score is the sum of the scores assigned by consumers to each question item in the questionnaire (1–5). The total farmer knowledge score is obtained by summing all the scores assigned by farmers to each question item in the questionnaire. In terms of interpretation, the higher the total farmer knowledge score, the higher the farmers' level of knowledge regarding chili farming management (Latif et al., 2015) . Conversely, the lower the total score, the lower the farmers' level of knowledge.

This study measured farmers' knowledge levels using six variables across 30 respondents. The following table summarizes farmers' knowledge levels based on these variables.

Table 5. Summary of Total Scores for Farmers' Knowledge Levels and Interpretation

No	Variable	Total Score	Percentage	Interpretation
1	Technical Knowledge of Aquaculture	1.046	77.48%	High
2	Use of Production Resources	880	73.33%	High
3	Knowledge of Pests and Diseases	814	67.83%	Moderate
4	Marketing Knowledge	733	68.91%	High
5	Business Management Knowledge	738	70.29%	High
6	Use of Agricultural Technology	690	65.71%	Moderate

Source: Processed primary data (2026)

Based on the table and primary data sources collected by the author, it is evident that the highest score indicating a "High" level is 1,046, out of 46 questions posed to 30 respondents.

3. Chili Pepper Production

According to Soekartawi (2002), production is the output obtained from a production process by utilizing various factors of production such as land, labor, capital, and technology.

Table 6. Descriptive Statistics of Chili Pepper Production

Number of Respondents	Minimum	Maximum	Average Production
30	580 kg	1,250 kg	915 kg

Source: Primary data processed in 2026

Based on the Descriptive Statistics Table for Chili Pepper Production, it is evident that the chili pepper production reported by respondents ranges from 580 kg to 1,250 kg per growing season, with an average production of 915 kg. Differences in production among farmers indicate variations in their ability to manage their farms as well as differences in the use of production factors. Farmers with high yields generally demonstrate better skills in applying cultivation techniques, using high-quality seeds, applying fertilizer according to recommended doses, and effectively controlling pests and diseases.

The average yield of 915 kg indicates that chili farming in Cilangkap Village has considerable potential for development. However, there are still opportunities to increase production by enhancing farmers' capacity, adopting technological innovations, and improving the efficiency of production factor utilization.

4. Results of Simple Linear Regression Analysis

Simple linear regression analysis is a statistical method used to determine the extent of the influence of the independent variable—farmers' knowledge—on the dependent variable—chili pepper production. This analysis yields a regression equation that can be used to explain the direction and magnitude of changes in chili pepper production resulting from changes in farmers' knowledge levels.

Table 7. Results of Simple Linear Regression Analysis

Variable	Coefficient (B)	Standard Error	T-Value	Sig.
Constant	248.617	124.523	1.997	0.055
Farmers' Knowledge	9,372	1,826	5,133	0.000

Source: Primary data processed in 2026

The results of the regression analysis show that the regression coefficient for farmers' knowledge is 9.372 and is positive. This indicates that for every 1-point increase in the farmers' knowledge score on the , chili pepper production will increase by 9.372 kg, assuming all other factors remain constant. A positive regression coefficient indicates that the higher the level of farmers' knowledge, the higher the chili pepper production. Good knowledge enables farmers to apply cultivation techniques in accordance with recommendations, thereby making the use of production factors more efficient.

5. T-Test Results

The t-test was used to test the significance of the effect of the farmer knowledge variable on chili pepper production in part. The test was conducted by comparing the calculated t-value with the table t-value or based on the significance level (Sig.). If the significance level is less than 0.05 or the calculated t-value is greater than the table t-value**,** then the farmer knowledge variable is considered to have a significant effect on chili pepper production.

Table 8. T-Test Results

Variable	Calculated t	Table t (α=5%)	Sig.	Decision
Farmers' Knowledge	5.133	2.048	0.000	Ho rejected

Source: Primary data processed in 2026

The calculated t-value of 5.133 is greater than the table t-value of 2.048, with a significance level of 0.000 (<0.05)**.** These results indicate that farmers' knowledge has a significant effect on chili pepper production. Thus, the hypothesis stating that farmers' knowledge has a positive effect on increasing chili pepper production is accepted.

6. Coefficient of Determination (Model Summary)

The coefficient of determination (R^2) is a statistical measure used to determine the extent to which the variable "farmers' knowledge" explains the variation in chili pepper production. The R^2 value ranges from 0 to 1. The higher the R^2 value, the greater the ability of the regression model to explain changes in the chili pepper production variable.

Table 9. Coefficient of Determination Results

R	R-Square	Adjusted R-Square	Standard Error of Estimate
0.696	0.484	2.048	125.318

A correlation coefficient (R) value of 0.696 indicates a strong, positive relationship between farmers' knowledge and chili pepper production. The R-squared value of 0.484 indicates that 48.4% of the variation in chili pepper production can be explained by farmers' knowledge levels, while the remaining 51.6% is influenced by other factors not included in the research model, such as land area, fertilizer use, labor, capital, climatic conditions, seed varieties, and farming experience. These results indicate that knowledge is one of the key factors in increasing chili farming productivity; however, increased production is not determined by knowledge alone. Other technical and economic factors also contribute to the success of chili farming.

Discussion :

The research results show that the level of knowledge among chili farmers in Cilangkap Village falls into the high category, with a value of 71.03**%.** The results of the simple linear regression analysis indicate that farmers' knowledge has a positive effect on chili production. This is evidenced by a positive regression coefficient and the results of the t-test, which show that the calculated t-value (5.133) is greater than the table t-value (2.048) with a significance level of 0.000 (<0.05)**.** These findings indicate that the higher the farmers' level of knowledge, the higher the chili pepper production.

Farmers' knowledge plays a crucial role in every stage of cultivation, from selecting high-quality seeds, land preparation, planting, fertilization, irrigation, and the control of plant pests and diseases, to harvest and post-harvest handling. Farmers with better knowledge tend to be able to apply cultivation techniques according to recommendations, resulting in more efficient use of production factors and increased crop yields. Conversely, farmers with low levels of knowledge tend to continue using cultivation methods based on traditional, passed-down practices, leading to lower production efficiency (Nuryas et al., 2026) .

The results of this study support *Human Capital* theory, which states that knowledge is a form of human capital that can increase productivity by enhancing the ability to make decisions and manage resources effectively. Furthermore, the findings align with Rogers' (2003) Theory of Innovation Diffusion, which explains that individuals with higher levels of knowledge are more likely to adopt and implement innovations more quickly than those with lower levels of knowledge. Thus, enhancing farmers' knowledge is a key strategy for boosting chili farming productivity.

Nevertheless, a coefficient of determination of 48.4% indicates that farmers' knowledge is not the sole factor influencing chili pepper production. There remains a 51.6% variation in production influenced by other factors, such as land area, agroclimatic conditions, fertilizer use, seed quality, labor, business capital, farming experience, and the intensity of pest and disease outbreaks. Therefore, increasing chili pepper production requires a more comprehensive approach that simultaneously considers technical, economic, and environmental factors.

Implications :

The results of this study have practical implications: improving farmers' knowledge must be a priority in chili farming development programs. Local governments, through the Department of Agriculture and the Agricultural Extension Center (BPP), are expected to increase the frequency of extension services, training, field schools, and demonstration plots for chili cultivation so that

farmers can obtain the most up-to-date information on cultivation techniques, the efficient use of production inputs, and integrated pest management (Yuniati et al., 2024) .
In addition, the use of information technology and digital media as a means of disseminating agricultural information needs to be continuously developed so that farmers can access information more quickly and easily (Nuzulia, 1967) . Enhancing farmers' capacity through non-formal education is expected to improve their ability to adopt technological innovations, which will ultimately lead to increased production and farm income.

Contributions of the Research :
This study offers both academic and practical contributions. From an academic perspective, this study adds empirical evidence regarding the influence of farmers' knowledge on chili pepper production, particularly among farmers in Cilangkap Village, Lengkong Subdistrict, Sukabumi Regency. The findings reinforce the Human Capital theory, which states that improving the quality of human resources through knowledge can boost business productivity.
From a practical perspective, the research findings can serve as a basis for local governments, agricultural extension workers, and related institutions in designing programs to enhance farmers' capacity through extension services, training, and mentoring. The information generated can also be utilized by farmers as a foundation to improve their ability to apply more effective cultivation techniques, thereby enabling sustainable increases in chili farming productivity.

Limitations :
This study has several limitations. First, the study used only one independent variable—farmers' knowledge level—and thus cannot account for all factors influencing chili pepper production. Second, the sample size consisted of only 30 farmers, so the findings are limited to the conditions of chili pepper farmers in Cilangkap Village and cannot be generalized to other regions with different characteristics. Third, the research data were collected via a questionnaire, so there remains a possibility of subjectivity on the part of respondents in providing their answers. Additionally, the study was conducted during a single growing season and therefore cannot yet account for changes in production levels resulting from variations in climatic conditions or different growing seasons.

Recommendations :
Based on the research findings, it is recommended that local governments and agricultural extension officers increase extension activities, training, and mentoring on good chili cultivation techniques, particularly regarding the efficient use of production inputs, the implementation of Integrated Pest Management (IPM), and the utilization of modern agricultural technology (Dwi Yanuar et al., 2021) . Enhancing farmers' capacity is expected to improve their knowledge and skills, thereby enabling chili pepper production to continue to increase.
Farmers are advised to actively participate in extension activities, training sessions, and farmers' groups to access the latest information on chili cultivation innovations. Additionally, farmers are encouraged to begin utilizing information technology as a knowledge resource to support decision-making in farm management.
For future researchers, it is recommended to develop research models by incorporating additional variables that may influence chili pepper production, such as land area, fertilizer use, labor, business capital, farming experience, climatic conditions, and access to extension services. Thus, the resulting model is expected to explain variations in chili pepper production more comprehensively.

CONCLUSION

Based on the research results, the level of knowledge among chili farmers in Cilangkap Village falls into the high category, with a Farmer Knowledge Level Index (ITPP) of 71.03**%.** The results of the simple linear regression analysis indicate that the level of farmers' knowledge has a positive and significant effect on chili production. The coefficient of determination (R^2) value of 0.484 indicates that farmers' knowledge explains 48.4% of the variation in chili pepper production, while the remainder is influenced by other factors outside the research model. Therefore, increasing farmers'

knowledge through extension services and training is expected to support increased productivity in chili pepper farming.

ACKNOWLEDGMENTS

The author would like to express his deepest gratitude to the Institute for Research and Community Service (LPPM) at Muhammadiyah University for the support provided throughout the course of this research. Special appreciation is also extended to the Agricultural Extension Center (BPP) of Lengkong Subdistrict, the Village Head of Cilangkap, and all members of the chili farmers' group in Cilangkap Village, who were willing to devote their time and provide honest data during the field data collection process.

AUTHOR'S CONTRIBUTION STATEMENT

Developed the research design, collected primary data through field surveys, and tabulated statistical data.

AI DISCLOSURE STATEMENT

The author used a large language model-based chatbot during the preparation of this work to refine the writing's grammar and complete the descriptive analysis framework in the discussion section to comply with the guidelines of national scientific journals. After using this service, the author thoroughly reviewed and edited the content as needed and assumes full responsibility for the content of this publication.

CONFLICT OF INTEREST

The authors affirm that there are no potential conflicts of interest—whether financial, institutional, personal, or commercial—that could affect the objectivity of this study's conduct, data analysis, manuscript preparation, or publication.

REFERENCES

Alindi, D. Y., Idmayanti, R., & Lestari, T. (2023). Application of an Expert System for Diagnosing Diseases in Chili Plants Using the Forward Chaining Method on an Android Platform. *Journal of Computer Science and Information Technology*, 4(2), 74–81.

Manda, J., Alene, A. D., Gardebroek, C., Kassie, M., & Tembo, G. (2021). Adoption and impacts of sustainable agricultural practices on maize yields and incomes: Evidence from rural Zambia. *Journal of Agricultural Economics*, 72(1), 123–143.

Kindangen, P., & Walewa, A. (2020). The Effect of the Number of Family Dependents on Farm Household Income. *Journal of Regional Economic and Financial Development*, 21(3), 45–56

Issahaku, G., & Abdulai, A. (2022). Sustainable agricultural practices, technical efficiency, and total factor productivity among horticultural farmers in Ghana. *Journal of Agricultural Economics*, 73(1), 224–244.

Abror, M., Miftakhurrohmat, A., & Prihatiningrum, A. E. (2026). *Growth characteristics of tomato (Solanum lycopersicum L.), eggplant (Solanum melongena L.), and chili pepper (Capsicum annuum L.) in an intercropping system under the shade of banana plants (Musa sp.)*.

Alindi, D. Y., Idmayanti, R., & Lestari, T. (2023). *Implementation of an Expert System for Diagnosing Diseases in Chili Plants Using the Forward Chaining Method on an Android Platform*. *4*(2), 74–81.

Amelia, S., Amelia, M., & Ibnusina, F. (2022). *Characteristics and Knowledge of Red Chili Farmers Regarding the Use of Chemical Pesticides: A Case Study in Payakumbuh Subdistrict, Lima Puluh Kota Regency, Indonesia*. *3*(2), 133–142.

Ragasa, C., Ulimwengu, J., Randriamamonjy, J., & Badibanga, T. (2020). Factors Affecting

Agricultural Productivity and Technology Adoption: Evidence from Comprehensive Baseline Surveys. *Agricultural Economics*, 51(5), 725–741..

Barokah, U., & Jannah, M. D. (2025). *The Effectiveness of Participatory-Based Training in Improving Farmers' Knowledge of PSB (Photosynthetic Bacteria) Organic Fertilizer Production*. *5*(2), 122–131.

Damayanti, L. (2013). *AND EMPLOYMENT OPPORTUNITIES IN IRRIGATED RICE FARMING*. *9*(2), 249–259.

Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). The Free Press.

Dewi, P. P., Prayitno, G., & Dinanti, D. (2021). *Characteristics of Respondents Regarding the Social Capital of the Pujon Kidul Tourism Village Community*. *10*(0341), 13–20.

Ibrahim, I., Lating, Z., Makayaino, H., Rumaolat, W., & Dahlan, M. (2025). *Pesticide Exposure as a Risk Factor for Health Problems Among Horticultural Farmers in Waimital Village, West Seram Regency*. *24*(3), 398–405.

Ilmiah, J., & Pendidikan, W. (2025). *Analysis of Marketing Efficiency for Large Red Chili Peppers at the Kemang Central Market in Bogor City Salsadila Agustin Wijayanti 1 1 Faculty of Agriculture, Singaperbangsa Karawang University*. *11* (November), 230–237.

Jaya, I. K. D., & Santoso, B. B. (2022). *Gema Ngabdi Journal: Extension on Off-Season Chili Cultivation on Dry Land in Gumantar Village, North Lombok Regency*.

Kadir, A., Sampara, N., & Halimah, A. S. (2025). *Strategies to Improve the Efficiency and Competitiveness of Clove Marketing to Enhance Farmers' Welfare: A Socio-Economic and Managerial Approach*. *11*, 3854–3861.

J., Dwi, Y., Ramadhana, F., & Subekti, S. (2021). *Utilization of Agricultural Extension Methods by Red Chili Farmers 2*(2), 113–133.

oekartawi. (2002). *Farm Business Analysis*. University of Indonesia (UI-Press).

Latif, Y., Bempah, I., Saleh, Y., Agribusiness, J., Agriculture, F., Gorontalo, U. N., Bolango, K. B., Agriculture, F., Gorontalo, U. N., & Bolango, K. B. (2015). *Farmers' Levels of Knowledge, Attitudes, and Skills Regarding Corn Farming in Tibawa Subdistrict, Gorontalo Regency*.

Limi, M. A., Tufaila, M., Erawan, D., Febrianti, E., Agribusiness, J., Agriculture, F., Halu, U., Science, J., Faculty, T., University, P., Oleo, H., Protection, J., Faculty, T., University, P., Oleo, H., Agrotechnology, J., Agriculture, F., Halu, U., & Kabawo, K. (2025). *ANALYSIS OF CORN FARMERS' LEVEL OF KNOWLEDGE ABOUT*.

Nuryas, A., Budiawati, Y., Agribusiness, P. S., Agriculture, F., Sultan, U., & Tirtayasa, A. (2026). *The Effect of Leaflets on the Knowledge of Curly Red Chili Farmers in Cimenteng Jaya Village, Cibadak Subdistrict, Lebak Regency*. *18* (April).

Nuzulia, A. (1967). Book on Farming Analysis. In *Angewandte Chemie International Edition, 6(11), 951–952.*

Saidah, Z., Wulandari, E., & Hapsari, H. (2024). *Analysis of Farmers' Attitudes and Perceptions to Increase Red Chili Production Through the Use of High-Yielding Seeds*. *35*(2), 200–212.

Sugiyono. (2020). *Quantitative, Qualitative, and R&D Research Methodologies*.

Yuniati, L., Anugrah, M. R., Hopipah, S., Himayatul, N., & Matienatul, Z. (2024). *Community Empowerment through Extension on the Effects of Drip Irrigation Techniques on the Cultivation of Bird's Eye Chili (Capsicum frutescens L.) in Kuta Village, Central Lombok*. *5*(1), 14–21.