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Household Economic of Shallot Farmers in Central Java Province, Indonesia

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Abstract: *This study aims to comprehensively analyze the economic comparison of shallot farmers' households, seen through income and profits. This includes analyzing the shallot agribusiness system and its development strategy in Central Java Province. Data collection was conducted on 140 respondents in the Brebes, Demak, and Pati Regencies. Income and profits were calculated and compared between locations using parametric tests, regression analysis, and measurement of inequality. The results showed that Brebes Regency's average shallot farming income was still relatively high, at IDR 51,338,602,-/farm or IDR 51,225,994,-/ha, higher than in Demak and Pati regencies. The life cycle of farmers, both productive and unproductive/old age groups, has no significant effect on the income and profits of shallot farming. Other factors, such as experience and the number of family members of farmers, affect income and profits.*

INTRODUCTION

Shallots are among the leading vegetable commodities farmers in Indonesia intensively cultivate. This commodity functions as a food seasoning and an ingredient for traditional medicine. Shallots are strategic commodities in developing the national agricultural sector because they are a source of income and employment opportunities contributing to regional economic development. Shallots are produced in almost all parts of Indonesia. The main shallot-producing area is Java Island, which includes Central Java, East Java, and West Java provinces. These three provinces accounted for more than 75% of the total production of shallots in Indonesia from 1980-2019. The shallot planting season in Java is almost entirely simultaneous with the dry season (Fauzan, 2016). However, in some production center districts, such as Brebes Regency, it occurs throughout the year without being season-bound (Fauzan & Tuga, 2023).

The profile of shallot farming is characterized by 80% of small farmers with a land area of less than 1 ha. This shallot cultivation business is generally a family business conducted for generations. Most shallot farmers have been cultivating shallots for up to 15-25 years. The motivation of farmers to choose shallot farming is generally because the selling price is quite good, even though the pattern of changes is quite extreme (Arafah *et al*., 2022) . To achieve maximum productivity, the shallot farming system must be carried out intensively, requiring extra skills and tenacity from each farmer.

The dynamics of strategic environmental changes faced by shallot farmers also require an

agricultural system more directed at system performance (including structure, farm management, and the farmer's household economy). The achievement of economic efficiency should not be seen partially, but how it is related also needs to be studied. In general, recent research related to the shallot farming system has been widely carried out, both in Indonesia (Susanawati & Fauzan, 2019; Kamardiani *et al*., 2021; Triyono *et al*., 2021; Kamanga *et al*., 2024; Saputri *et al*., 2024; Wijaya *et al*., 2024) and in the world's central onion-producing countries such as China, India, United States, Egypt, and Turkey (Anjum & Barmon, 2018 ; Tsuchiya *et al*., 2021 ; Sharma & Chauhan, 2022 ; Shin *et al*., 2023). The aspects of the study that are generally discussed are cultivation technology (agronomy), seed variety breeding, pest and disease management, marketing, and supply chain.

Based on the literature review, there is a research gap in the form of research areas that have not been widely studied by other researchers, including the shallot farming system from the perspective of household economic achievement and its relation to the agribusiness system. Agribusiness consists of four subsystems (Rahayu *et al*., 2023) : the upstream agribusiness subsystem, the on-farm agribusiness subsystem, the downstream agribusiness subsystem, and the supporting services subsystem.

The purpose of this study is to comprehensively compare the household economy of shallot farmers, which is seen through the achievement of income and farm profits. This includes analyzing the shallot agribusiness system and its development strategy in Central Java Province. An important contribution of this study is that one important dimension of heterogeneity was considered in the analysis: differences in the stages of the farmer's life cycle. Farming income and profits will be calculated and compared in terms of level and distribution between locations using several methods, namely parametric tests, regression analysis, and measurement of inequality. The results of this study will reveal important insights about the balance of income and profits between shallot farming locations in Central Java Province, as well as business development strategies and agribusiness systems.

RESEARCH METHOD

The research location was determined purposively, namely the method of taking regional samples based on specific characteristics of the research objectives. The research locations selected were three Central Java districts: 2 production center areas (Brebes and Demak districts) and one non-production center area (Pati Regency). The location is considered representative in describing the shallot farming system in Java, considering that the four regions contribute more than 35% of the total shallot production in Java. The number of respondents in each district was 30, 50, and 60 farmers, so the total respondents for this study were 140 farmers. Primary data collection was done by direct observation at the research site.

The economic comparison of shallot farmer households in each location was analyzed by calculating income and profit. Due to the heterogeneity of farm households, analysis was also conducted for subgroups of households based on the stages of their life cycle. Several methods used to compare the economic welfare of shallot farmer households are parametric tests, regression analysis, and measurement of inequality. Shallot farming households may have the same average welfare, but the distribution of income and profits among households may differ. The degree of inequality in the distribution of income and wealth is measured using the Gini coefficient.

PESHUM : Jurnal Pendidikan, Sosial dan Humaniora
Vol.4, No.3, April 2025

RESULT AND DISCUSSION

Shallot Farmer's Household Economic

The total income and profits of the farm often represent the economic success of a farmer's household. Table 1 shows the average and median income and profits of shallot farming in the Brebes, Demak, and Pati Regencies. The average income of IDR 51,338,602/farm for Brebes Regency is much higher than the average income of Demak and Pati Regencies, where each gets IDR 32,986,484,-/farm and IDR 12,121,024,-/farm. Shallot farmer households in Brebes Regency also get a higher average profit than those in Demak and Pati Regencies. These results show that household economic welfare varies depending on the characteristics of farming activities, such as land area, amount of capital, use of inputs for production facilities such as seeds, fertilizers, pesticides, and the labor involved. This finding aligns with a previous study by Patel *et al*., (2015), Salam *et al*., (2019), Ma *et al*., (2021), and Takeshima *et al*., (2022).

Table. 1 Descriptive Statistics of Shallot Farming Income and Profit

	Brebes	Demak	Pati
Mean land area (ha)	1,28	0,38	0,18
Mean productivity (ton/ha)	5,64	8,37	7,48
Mean income (IDR/farm)	51.338.602	32.986.484	12.121,024
Mean income (IDR/ha)			
All	51.225.994	88.748.338	62.717.372
Age < 45	53.151.886	93.608.004	68.688.004
Age 46-55	47.073.570	86.079.725	58.224.141
Age > 55	62.262.811	93.261.609	60.152.476
Median income (IDR/ha)			
All	45.542.139	88.868.058	61.638.407
Age < 45	57.111.065	89.857.368	61.889.313
Age 46-55	35.216.056	87.531.388	57.798.011
Age > 55	72.593.333	91.420.003	66.399.877
Mean profit (IDR/ha)			
All	49.329.444	88.315.340	59.555.508
Age < 45	49.683.393	93.277.656	65.328.040
Age 46-55	45.793.865	85.659.025	55.268.317
Age > 55	60.784.098	92.557.720	56.992.170
Median profit (IDR/ha)			
All	44.359.666	88.588.250	58.203.741
Age < 45	53.237.924	89.645.060	57.419.983
Age 46-55	33.394.016	87.373.493	54.655.154
Age > 55	70.233.422	90.346.669	61.697.704
Number of sample households	30	50	60

A similar trend is also found in the average value of the median for the income and profits of shallot farming. Households with extensive land tenure and high input use will earn higher incomes and profits. Interestingly, when we look at the value of income and profits for 1 ha land conversion, shallot farmers in Demak Regency get higher income and profits than farmers in Brebes and Pati Regencies. The main factor is the higher productivity, which is 8.37 tons/ha, compared to the productivity of shallots in Brebes and Pati Regencies, which are 5.64 tons/ha and

7.48 tons/ha, respectively. However, these values are lower than their potential productivity.

Another source of heterogeneity among households is their stage in the life cycle. Overall, farmer household incomes in the Brebes, Demak, and Pati Regencies show a typical life cycle pattern of higher incomes for the youngest and oldest groups. Lower income for the age group between 46 and 55 years. However, some of these income trends, especially for the youngest and oldest households, differ based on the involvement of these households in business activities. Therefore, these findings suggest that the households of young farmers are not significantly different compared to their counterparts who have been shallot farmers for longer. The profits of shallot farmers also show an inverted hump-shaped life cycle distribution where the net worth is highest for households that were in the years before leaving the business in old age.

Table. 2 Mean Comparisons Shallot Farming Income and Profit

	Brebes		Demak		Pati	
Income						
Brebes	0		-37,522,344	***	-11,491,378	ns
Demak			0		26,030,966	***
Pati					0	
Profit						
Brebes	0		-38,985,895	***	-10,226,063	ns
Demak			0		28,759,832	***
Pati					0	

Notes: The numbers in the table are differences in means between location group. Asterisk *** denotes significance at the 1% level.

The results of the parametric analysis of mean comparisons show that the income and profit per ha of shallot farming in Brebes Regency is lower when compared to the income and profit per ha of shallot farming in Demak Regency and Pati Regency, as can be seen in Table 2. Each difference is IDR 37,522,344,-/ha and IDR 11,491,378,-/ha for income and IDR 38,985,895,-/ha and IDR 10,226,063,-/ha for profit. The analysis results also show that the income and profits of shallot farming in Demak Regency are significantly higher than in Pati Regency, which is IDR 26,030,966,-/ha, and IDR 28,759,832,-/ha, respectively.

Regression Analysis Results

Regression analysis was used to examine differences in the income and profits of shallot farming at various stages of the farmer's life cycle. The different stages of the life cycle (age 45, 45-55, and > 55) were represented by dummy variables. To get the best econometric model, the youngest age group is excluded from the regression model so that the productive age group of farmers can be compared with the older age group. The regression analysis has the added advantage of being able to include other explanatory variables that may affect farm income and profits, such as the level of formal education of the farmer, the length of time the farmer has run the shallot farming (experience) and the number of members of the farmer's household.

The results of the regression analysis generally show that the life cycle of farmers, both productive age groups (45-55 years) and unproductive/old age (> 55 years), does not significantly affect the income and profits of shallot farming, as can be seen in Table 3. This phenomenon coincided in three research locations: shallot production centers in Central Java Province, namely Brebes, Demak, and Pati Regencies. The lack of variation in income and profits between farmer age groups indicates that the substantial managerial skills required to run a shallot farming are not strongly influenced by age, as stated by Kumari & Bisht, (2023).

Other factors such as experience and number of family members of farmers have been shown to affect the amount of income and profits obtained. In Brebes Regency, the experience and number of family members of farmers have an opposite relationship about the income and profits of shallot farming. The experience of farmers harms income and profits, while the number of family members of farmers has a positive effect. Shallot farmers running their farms for decades may be reluctant to accept innovations. Relatively inexperienced farmers will be more open to new things in their farming. The increasing number of family members has also been proven to increase the motivation of farmers to get higher incomes and farm profits. Interestingly, in Pati Regency, the number of family members of farmers has a negative relationship with farm income and profits. This means that the fewer the number of family members, the greater the income and benefits obtained.

Table 3. Regression Result for Farm Households

	Brebes		Demak		Pati	
Income						
Intercept	21,062	***	18,093	***	27,329	***
Age class 46-55	0,027	ns	-0,042	ns	1,107	ns
Age class > 55	0,600	ns	0,114	ns	1,381	ns
Education	-0,622	ns	0,129	ns	-0,890	ns
Farming experience	-0,776	**	-0,068	ns	-0,932	ns
Household size	0,221	*	0,139	ns	-4,924	*
Adj R^2	0,126		0,038		0,013	
Profit						
Intercept	20,631	***	18,080	***	27,263	***
Age class 46-55	0,044	ns	-0,043	ns	1,101	ns
Age class > 55	0,623	ns	0,112	ns	1,346	ns
Education	-0,513	ns	0,133	ns	-0,908	ns
Farming experience	-0,736	*	-0,068	ns	-0,944	ns
Household size	0,216	*	0,139	ns	-4,862	*
Adj R^2	0,096		0,038		0,011	

Notes: Triple asterisks (***), double asterisks (**), and single asterisk (*) denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Inequality Measures

Comparing the average income and profits of shallot farming, of course, has limitations. While shallot farming in one location may have the same average income and profits as in another, the distribution among farmer groups in that location may differ. Such considerations are important because policymakers need to pay attention to income inequality and equity among farmer groups and the redistribution of resources in the agricultural sector.

The Gini ratio measures the income and profit inequality level between shallot farms, as seen in Table 4. The Gini coefficient of 0 represents full equality among farmers, while the coefficient of 1 represents total inequality where one farm accommodates all income or profits. The results showed that the income inequality of shallot farming was almost the same as the profit inequality of shallot farming in each region. This indicates that the implicit costs of shallot farming, the difference between income and profit, are relatively equal among farmers and have a tiny proportion of the total cost of shallot farming.

Income and profit inequality were found to differ by location. The Gini coefficient for

shallot farming income inequality in the Demak Regency is lower (0.05) compared to the Brebes Regency (0.27) and Pati Regency (0.26). In other words, the shallot farmer groups in Brebes Regency and Pati Regency have a higher level of income inequality among themselves. This happens because a small number of farmers can control a vast land of more than 3 ha. This group of farmers generally has more than 30 years of experience as shallot farmers and has a significant enough farming capital with a large number of paid workers. This large group of farmers closely works with prominent collectors to market their crops.

Table. 4 Inequality Measures for Farm Households

	Brebes	Demak	Pati
Gini coefficient for income	0,27	0,05	0,26
Gini coefficient for profit	0,27	0,05	0,27

On the other hand, shallot farmers in Demak Regency tend to have a more even income among them. One explanation for this result is that management skills contribute to farm success and contribute to the more significant differences in observed incomes. The characteristics of shallot farmers who are relatively homogeneous in terms of land area, age, and experience will tend to produce a relatively uniform amount and distribution of income between farms. The gini coefficient of 0.05 for the distribution of shallot farming income in Demak Regency is very close to 0, representing full equality among farmers.

Although not specifically examined in this paper, the farmer's life cycle stage will likely affect income inequality and shallot farming profits. Olawuyi & Mushunje, (2023) reported that the oldest household group usually has the highest income inequality. Meanwhile, wealth inequality is generally highest for the youngest household groups. Overall, the findings of this study indicate that income inequality and profit are similar for shallot farming in the Brebes and Pati districts. Meanwhile, shallot farming in Demak Regency has the lowest income and profit inequality.

Shallot agribusiness system

Agribusiness consists of four subsystems: the upstream agribusiness subsystem, the on-farm agribusiness subsystem, the downstream agribusiness subsystem, and the supporting services subsystem. Each subsystem consists of business activities that can stand alone or in groups, cooperatives, and large companies. As a system, the performance of each activity in the subsystem is highly dependent on its relationship with other subsystems.

The upstream agribusiness subsystem is an economic activity that provides production facilities for farming (on the farm), such as the agrochemical industry and trade (fertilizers and pesticides), agro-automotive industry (machinery and equipment), and seed industry. The actors in business activities and the distribution of production facilities are individuals, private companies, the government, and cooperatives. The success of shallot farming production in the on-farm subsystem is strongly influenced by its connectivity with the upstream subsystem. Seeds are a very important production factor in shallot farming. In practice, seeds are a determining factor, especially regarding their availability, quality, and price. Seeds account for almost half of the total cost of shallot farming and occupy the most significant portion of the cost component (Fauzan, 2020) , so the selection of high-quality seeds is an absolute requirement for optimal shallot production. The use of superior seeds for shallot farming is not only directed at increasing production quantity. However, it is also directed at improving the quality of the resulting production in accordance with consumer demand and tastes.

PESHUM : Jurnal Pendidikan, Sosial dan Humaniora
Vol.4, No.3, April 2025

The shallot downstream subsystem has main problems, namely a very long marketing chain and price fluctuations that occur throughout the year. A lack of processing technology also characterizes the downstream subsystem to support the shallot downstream industry, both household and industrial scale, such as dry sliced, wet sliced, fried shallot, and others. Regarding the visitor subsystem, access to credit for shallot farming, which requires significant capital, must also be improved.

Developing value chains for agribusiness products, such as shallots, distinguishes it from developing value chains for non-agribusiness products. This is related to the unique characteristics of the farm itself. There are quite a lot of lessons learned that are specific to developing the value chain of agribusiness products, including:

1. Production of agricultural products in the agribusiness value chain is generally obtained from small-scale production businesses. This makes producer actors in the agribusiness value chain generally economically inefficient.
2. Production of agricultural products is seasonal, so producer actors in the value chain generally do not have the technology to fully guarantee that their production meets a good and uniform standard. This is also influenced by the dependence on natural conditions, which is still relatively large.
3. Agricultural product production is bulky, making it relatively difficult to handle packaging and transportation.
4. Production of agricultural products is fresh with a relatively short shelf life. For this reason, the agribusiness value chain requires special handling to ensure that products reach consumers quickly and meet consumer desires.
5. Production locations that are relatively dispersed and not in one location will cause high-yield quality diversity and require higher handling costs.

The position of farmers in the shallot agribusiness value chain is relatively weak and highly dependent on the collectors, who are the only parties who will buy their crops. Generally, the shallots are purchased in a slash or scale at a relatively low price. The existence of an urgent need for daily needs means shallots can still be sold by farmers even at low price levels.

The quality of the shallot of the Bima variety from Brebes Regency is highly favored by the final consumers, namely homemakers who buy shallots for daily cooking purposes. The value desired by shallot consumers includes various indicators of food quality (Yofananda et al., 2020; Lintang et al., 2022), such as shape, size, color, taste and smell, and cleanliness. The main choices consumers desire are shallots that meet the quality of a round shape, medium size, dark red color, pungent taste and smell, and clean from dirt.

Upgrading options that can be carried out in the shallot agribusiness value chain in Java, which are more in favor of smallholders, include:

1. Consistent use of high-yielding seeds of the Bima variety, because usually during the growing season, seeds become scarce, and farmers are forced to use seeds of other varieties or seeds from previous harvests that were not prepared to become seeds.
2. The existence of organizations such as farmer groups can be a place to accommodate shallots when the selling price falls so that farmers have other alternatives besides selling to collectors. Farmer groups can also act as intermediaries between farmers directly and wholesalers in the wholesale market so that they have a higher bargaining position and, in the end, will be able to get a higher price.
3. Farm farmer organizations manage a cold storage facility to store the shallot harvest during the harvest season to avoid falling prices.
4. Optimizing the existence of agribusiness sub-terminals for the benefit of farmers, where

currently various existing facilities are controlled by traders.

CONCLUSION

The average income of shallot farming in Brebes Regency is still relatively high, IDR 51,338,602,-/farm or IDR 51,225,994,-/ha. Higher than the income of shallot farming in Demak and Pati regencies. The life cycle of farmers, both productive age groups and unproductive age groups, has no significant effect on the income and profits of shallot farming. Other factors such as experience and number of family members of farmers have been shown to affect the amount of income and profits obtained. The main problems in the shallot farming system in Java include a very long distribution chain, price fluctuations, stagnant productivity in the main production centers, and weak farmer marketing institutions. Upgrading options that can be done are the consistent use of superior seeds of the Bima variety, the existence of farmer organizations that can accommodate harvests when prices fall, the existence of cold storage facilities, and optimizing the existence of agribusiness sub-terminals for the benefit of farmers.

REFERENCES

Anjum, A., & Barmon, B. K. (2018). Profitability and Comparative Advantage of Onion Production in Bangladesh: An Economic Study in Some Selected Areas. *The Agriculturists*, *15*(2), 66–78. https://doi.org/10.3329/agric.v15i2.35466

Arafah, S. N., Ayu, S. F., & Wibowo, R. P. (2022). The Effect of Behavior and Characteristics of Shallot Farmers on Production Risk in Deli Serdang District. *Randwick International of Social Science Journal*, *3*(4), 870–877. https://doi.org/10.47175/rissj.v3i4.509

Fauzan, M. (2016). Pendapatan, risiko dan efisiensi ekonomi usahatani bawang merah di Kabupaten Bantul. *AGRARIS: Journal of Agribusiness and Rural Development Research*, *2*(2), 107–117. https://doi.org/10.18196/agr.2231

Fauzan, M. (2020). Pendapatan rumah tangga petani bawang merah lahan pasir pantai di Kabupaten Bantul. *JAS (Jurnal Agri Sains)*, *4*(1), 60–66. https://doi.org/10.36355/jas.v4i1.362

Fauzan, M., & Tuga, G. W. (2023). Enrichment: Journal of Management Strategies for sustainable livelihoods of shallot picking workers households in Brebes Regency. *Enrichment: Journal of Management*, *13*(4), 2561–5268. https://doi.org/10.35335/enrichment.v13i4.1619

Kamanga, B. M., Widajati, E., Ilyas, S., & Palupi, E. R. (2024). Effect of Seed Invigoration by Osmo-Conditioning on Radicle Emergence and Physiological Parameters of the True Seed of Shallot (Allium Ascalonicum L.). *Horticultural Science*, *51*(1), 39–50. https://doi.org/10.17221/150/2022-hortsci

Kamardiani, D. R., Fauzan, M., & Riansyah, K. S. (2021). The feasibility of environmentally friendly and conventional shallot farming in Bantul Regency. *IOP Conference Series: Earth and Environmental Science*, *883*(1), 012070. https://doi.org/10.1088/1755-1315/883/1/012070

Kumari, N., & Bisht, K. (2023). Identification of Core Competencies for Managing Farmer Producer Organizations Using Factor Analysis. *Ijee*, *59*(3), 108–112. https://doi.org/10.48165/ijee.2023.59320

Lintang, M., Layuk, P., Tandi, O. G., & Salamba, H. N. (2022). Consumer Preference Level of Fried Shallots From Several Varieties. *E3s Web of Conferences*, *361*, 04020. https://doi.org/10.1051/e3sconf/202236104020

Ma, M., Lin, J., & Sexton, R. J. (2021). The Transition From Small to Large Farms in

Developing Economies: A Welfare Analysis. *American Journal of Agricultural Economics*, *104*(1), 111–133. https://doi.org/10.1111/ajae.12195

Olawuyi, S. O., & Mushunje, A. (2023). Distribution Pattern of Households' Income Inequality in Eastern Cape, South Africa. *International Journal of Research in Business and Social Science (2147-4478)*, *12*(5), 237–247. https://doi.org/10.20525/ijrbs.v12i5.2548

Patel, K., Gartaula, H., Johnson, D., & Karthikeyan, M. (2015). The Interplay Between Household Food Security and Wellbeing Among Small-Scale Farmers in the Context of Rapid Agrarian Change in India. *Agriculture & Food Security*, *4*(1). https://doi.org /10.1186/s40066-015-0036-2

Rahayu, I., Iskandar, R., & Syaban, R. A. (2023). Links Between Internal Factors, External Factors, Implementation of Standard Operational Procedure (SOP) With Shallot Farmers Productivity in Bondowoso. *Jurnal Agrinika Jurnal Agroteknologi Dan Agribisnis*, *7*(1), 57–66. https://doi.org/10.30737/agrinika.v7i1.2255

Salam, S., Bauer, S., & Palash, Md. S. (2019). Impact of Income Diversification on Rural Livelihood in Some Selected Areas of Bangladesh. *Journal of the Bangladesh Agricultural University*, *17*(1), 73–79. https://doi.org/10.3329/jbau.v17i1.40666

Saputri, T. D., Fauzan, M., Resiana, T., & Kamardiani, D. R. (2024). Technical Efficiency Analysis of Environmentally Friendly Shallot Farming Based on the Planting Season in Bantul District. *BIO Web of Conferences*, *144*. https://doi.org/10.1051/bioconf/ 202414405005

Sharma, D., & Chauhan, A. (2022). Kharif Onion Production in India- Present Status and Future Potential: A Review. *Agricultural Reviews*, *Of*. https://doi.org/10.18805/ag.r-2455

Shin, J., Lee, H.-K., Back, C., Kang, S., Han, J., Lee, S.-C., & Han, Y.-K. (2023). Identification of Fusarium Basal Rot Pathogens of Onion and Evaluation of Fungicides Against the Pathogens. *Mycobiology*, *51*(4), 264–272. https://doi.org/10.1080/12298093.2023. 2243759

Susanawati, S. P., & Fauzan, M. (2019). Risk of shallot supply chain: An analytical hierarchy process (AHP) model in Brebes Java, Indonesia. *Int. J Sup. Chain. Mgt*, *8*(1), 124–131.

Takeshima, H., Balana, B., Smart, J., Edeh, H., Oyeyemi, M., & Andam, K. S. (2022). Subnational Public Expenditures, Short-term Household-level Welfare, and Economic Flexibility: Evidence From Nigeria. *Agricultural Economics*, *53*(5), 739–755. https://doi.org/10.1111/agec.12710

Triyono, T., Fauzan, M., Mu'awanah, J., & Sedek, M. (2021). Production Factor Efficiency of Shallot Farming in Pati, Central Java, Indonesia. *E3s Web of Conferences*, *316*, 02036. https://doi.org/10.1051/e3sconf/202131602036

Tsuchiya, Y., Nakamura, Y., & Mikami, T. (2021). Japanese Bulb Onion: Production, Consumption, and Cultivars. *Journal of Horticultural Research*, *29*(1), 75–82. https://doi.org/10.2478/johr-2021-0002

Wijaya, O., Mufti Agung, D., Man, N., & Fauzan, M. (2024). The Relationship Between Entrepreneurial Characteristics of Farmers and The Performance of Shallots Farming in The Bantul Regency. *E3S Web of Conferences*, *595*. https://doi.org/10.1051/ e3sconf/202459501017

Yofananda, O., Wijaya, C. H., Lioe, H. N., & Sobir, S. (2020). Fried Shallot Quality: Perception and Differentiation. *Current Research in Nutrition and Food Science Journal*, *8*(1), 97–106. https://doi.org/10.12944/crnfsj.8.1.09