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Analysis of the Correlation Between the Effectiveness of Subsidized Fertilizers and Farmer Welfare: The Role of Livelihood Asset Management Strategy (Case Study of Wedi, Kapas, Bojonegoro, East Java)

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Abstract: Most residents of Wedi village work as farmers. There are 3 farmer groups in Wedi village: Tani Makmur, Mekar Tani, and Tunas Harapan. This study aims to analyze the factors influencing the effectiveness of subsidized fertilizer distribution and to determine the correlation between the effectiveness of subsidized fertilizer distribution in increasing rice productivity in Wedi Village, Kapas District, Bojonegoro Regency. The number of samples in this study was 82 respondents measured based on the three farmer groups. The method used for analysis was SEM PLS. Data collection techniques in this study were in the form of primary and secondary data with quantitative analysis using a Likert scale. The results of the analysis showed that livelihood assets significantly influenced distribution effectiveness and farmer welfare, distribution effectiveness had a mediating effect on the correlation between livelihood assets and farmer welfare. Farmer welfare can be seen from income and the amount of farm production that can be measured in rupiah units in one season.

Keywords: Effect of effectiveness; Farmer welfare; Subsidized fertilizer

Introduction

Agriculture is a major sector, especially in the Indonesian economy, with the population, particularly in rural areas, relying on farming for their livelihood. Farmers play a crucial role in producing food and meeting the food needs of society. However, farmers often face various obstacles and challenges in their efforts to increase yields and improve agricultural income. One effort to increase agricultural productivity is the provision of subsidized fertilizers. Agricultural productivity still occupies one of the essential sectors, especially in national economic development (Maman et al., 2021). Subsidized fertilizers in agriculture can further encourage agricultural specialization and yield agricultural products, directly affecting farmers, while in terms of farmers' income, it can be increased through agricultural productivity from government subsidies (Kirwan et al., 2016).

Wedi Village is one of the villages located in Kapas District, Bojonegoro Regency, which distributes subsidized fertilizers and has a population of 4,910 people. It is divided into 1 hamlet with 2 Head of Hamlets and 21 Neighbourhood head. This subsidized fertilizer program aims to improve agricultural welfare, especially in the food sector. Most residents of Wedi village work as farmers. There are 3 farmer groups in Wedi village: Tani Makmur with 225 members, Mekar Tani with 113 members, and Tunas Harapan with 133 members (Pemerintah Desa Wedi, 2023).

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The use of subsidized fertilizers is necessary to increase rice production, and increased rice production can automatically increase farmers' income. The following is data on subsidized fertilizers in Kapas District from 2019 to 2022.

Table 1. Data on the Realization of Subsidized Fertizers from 2017-2023 (Tons)

	2017	2018	2019	2020	2021	2022
Urea						
Alocation	1.579	1.552	1.504	1.277	1.211	1.405
Realization	1.552	1.237	1.358	1.277	1.187	945
Surplus	27	293	146	15	24	460
Petroganik						
Alocation	898	824	1.273	952	716	408
Realization	883	827	909	910	657	408
Surplus	15	-3	364	42	59	0
Za						
Alocation	687	519	859	627	0	0
Realization	687	524	828	602	0	0
Surplus	0	-5	31	25	0	0
SP 36						
Alocation	466	413	387	216	0	0
Realization	464	421	380	216	0	0
Surplus	2	-8	7	0	0	0
NPK						
Alocation	1.169	845	630	1.121	787	958
Realization	1.169	931	615	1.121	777	626
Surplus	0	-86	15	0	10	332

Source: The department of agriculture, food Bojonegoro (2023)

The data shows that there was a reduction in subsidized fertilizer assistance from 2017 to 2022. One of the problems faced in increasing farmers' income is the availability of fertilizers during the planting season. Based on the table data on the realization of subsidized fertilizers, there is a difference between the planned fertilizer allocation and the actual realization.

In recent years, there have been surpluses or shortages of fertilizers after distribution, as in 2017 with a surplus of 27 tons of urea, 15 tons of petroganik, and 2 tons of SP 36. In 2022, there was a surplus of 460 tons of urea and 332 tons of NPK. This indicates obstacles or constraints in the process of distributing subsidized fertilizers, impacting the availability of fertilizers for farmers. The more surplus fertilizer that is not distributed, the more it affects the government's consideration to reduce the allocation of fertilizers in the following year. The Bojonegoro government does not only use the previous year's surplus fertilizer as a reference for the allocation in the following year but is balanced by an increase in the amount of the Bojonegoro Regency APBD.

Based on a survey of the government's fertilizer distribution system shift from 2017-2022, which initially used the RDKK system, in 2023, it changed to using the e-allocation system. The use of the RDKK system in previous years led to a gap between the farmers' needs proposed through e-RDKK and the subsidized fertilizer allocation budgeted by the government. With this e-allocation system, there is a concrete impact that there is no gap between farmers and the government, and the distribution is controlled by distributors, retailers, and kiosks. E-allocation is a system for managing fertilizer allocation and distribution electronically. The use of this system has a weakness: if the allocation quota between regions is the same, the farmers' receipts in those areas will not be the same because it depends on the conditions of the area and the distribution of KPM in several of these areas.

Productivity, as stated by Sari et al. (2019), is the process by which human resources can efficiently produce valuable outputs using resources. Productivity also involves paying attention to the outputs produced by human resources by considering the ratio between inputs and outputs. Farmer welfare is measured by the level of income and the amount of farm production that can be measuredin rupiah units in one season (Hartati et al., 2017).

The existence of the five main assets (livelihood assets) has long been associated with welfare. One study by Wijayanto et al. (2019) suggests that mastery of these five assets can be the key to human well-being in improving their lives. This study uses Structural Equation Modeling (SEM) analysis, a statistical technique consisting of several tools and methods that allow us not only to model correlations between variables but also to test a series of complex correlations simultaneously. these complex correlations may involve one or more dependent variables with one or more independent variables. Both the dependent and independent variables can be factors (constructs built from several indicator variables). These variables can be a single measurable or directly observable variable. Variables (Gunarto, 2018).

Method

The research location is in Wedi Village, Kapas District, Bojonegoro Regency. The research time was from October to February 2023. In this study, primary and secondary data collection techniques were used. Primary data was obtained from interviews with farmers and members of farmer groups in Wedi Village, and secondary data was obtained from BPS data, the Agriculture Office, supporting theses, and other articles. The population in this study was 471 people from 3 farmer groups, with 225 members from Tani Makmur, 113 members from Mekar Tani, and 133 members from Tunas Harapan.

The sampling technique used was proportionate sampling method. According to Sugiyono (2018),

proportionate stratified random sampling is a technique used when the population with members/elements is not homogeneous and stratified proportionally. In this study, to determine the number of samples to be used in the research, namely Tani Makmur 39 people, Mekar Tani 20 people, and 23 people from Tunas Harapan.

The data analysis used in the research was: Partial Least Square (PLS) analysis was used to assist researchers in identifying latent variables to be used for prediction purposes (Ghozali et al., 2015). The approach used was quantitative, with the aim of testing theories, based on facts, showing Correlations between variables, providing statistical descriptions, estimating, and predicting results.

The quantitative approach focuses on collecting and analyzing numerical data to answer research questions and test hypotheses. Quantitative research is a process of measuring data that is statistical or numerical through analysis from a survey of several respondents to determine the percentages or responses of the respondents (Creswell. 2014). In analyzing the data for this study, Structural Equation Modeling (SEM) was used. This approach was through a questionnaire with the aim of analyzing data to answer research questions and test hypotheses from these variables (Creswell, 2014). SEM is a collection of statistical techniques that allows for the simultaneous testing of a series of relationships built between one or more independent variables (Santoso, 2011). In the Likert scale, respondents were asked to complete the questionnaire data regarding their opinions about their level of agreement with a series of statements. This level of agreement usually consists of five scale choices, namely strongly disagree (STS), disagree (TS), neutral (N), agree (S), and strongly agree (SS) (Taluke, 2019).

This study is a type of quantitative research; therefore, data validity is checked by conducting validity and reliability tests. These tests are carried out to assess whether each question point is suitable for use in collecting research data (Sujarweni, dkk 2012).

Results And Discussion

Factors of Effectiveness of Subsidized Fertilizer Distribution using PLS

In testing convergent validity by looking at the correlation coefficient value between the reflective indicator score and the latent variable score. Hair et al. (2014) explains that if the factor loading value > 0.50, it can be considered to have met the convergent validity criteria. The results of the convergent validity test show that each factor loading will be valid if the AVE value > 0.50.

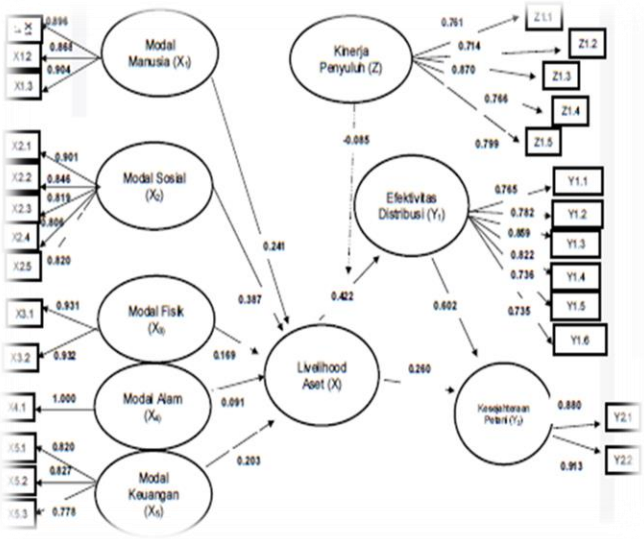

Figure 1. Path diagram output using SEM-PLS

Convergen Validity

The convergent validity of the measurement model with reflective indicators is assessed through the correlation between the item/component score calculated using PLS. The correlation is considered valid if > 0.70 with the measured construct. The path diagram output can be seen in Figure 1, which shows that each indicator variable has an outer loading value > 0.60, so that value can be said to be valid. Based on the data presented in the figure, it is known that each indicator of the research variable has an outer loading value > 0.6. It can be seen that the outer loading value states valid in the research in Wedi Village. According to Ghozali (2015), outer loading values of 0.5 to 0.6 are still acceptable, and convergent validity can be met. Values below 0.5 can be dropped from the analysis.

Table 2. Discriminan Validity with Average Variance Extracted (AVE)

Variable	AVE	Description
Livelihood Aset	0.633	Valid
Distribution Effectiveness	0.615	Valid
Farmer Welfare	0.803	Valid

Source: Primary Data, Processed 2024

Discriminant validity testing uses two approaches: examining the loading values and cross-loadings to assess the discriminant validity of indicator items, as well as evaluating the square root of AVE values for all indicators in the questionnaire (Solimun et al., 2022). To assess Discriminant Validity, the method that can be used is the Average Variance Extracted (AVE). For each variable, the AVE value must be greater than 0.5 to be considered valid. Based on the data above, it can be concluded that all AVE values are significant because each variable has a value greater than 0.5. Following

Trenggonowati et al. (2018), when the AVE value exceeds 0.5, it indicates that each latent variable is considered valid.

Composite Reliability

Composite reliability is a part used to test the reliability value. The composite reliability results are considered good if the value is above 0.7. According to Jung et al. (2018), a measuring instrument is stated to be reliable (CR) above 0.7 and composite reliability (CR) above 0.7. In the table above regarding the Composite Reliability (CR) value, it can be seen that the composite reliability value of all variables > 0.7. It can be concluded that each of the tested variables is said to be reliable. According to Ghozali et al. (2015), it is stated that a construct is considered reliable if the composite reliability value is above 0.7. The CR value above 0.8 can be seen with the lowest value of 0.850 for the financial capital latent variable. This shows that the data that has been tested is reliable and consistent. a measurement instrument is considered reliable when the variable's reliability (CR) and composite reliability (CR) are above 0.7 (Jung et al., 2018).

Table 3. Composite Reliability

Variable	Composite Reliability	Crobach's Alpha
Livelihood Aset (X)	0.960	0.955
Distribution Effectiveness (Y1)	0.905	0.875
Farmer Welfare (Y2)	0.891	0.756

Source: Primary Data, Processed 2024

Evaluation of the Inner Model

The inner model is a test by evaluating the latent constructs that have been hypothesized in the study (Hermawan et al., 2019). The inner model measurement can be seen from the path coefficient, R-Square, and F-Square. Path Coefficient. The path coefficient is used to show how strong the effect or influence of the independent variable on the dependent variable. According to Natalia et al. (2014), if the value of the path coefficient is positive, it indicates that the effect of one variable on the influenced variable is in the same direction. Conversely, if the path coefficient value is negative, it indicates that the effect of one variable on the influenced variable is in the opposite direction.

Table 4 Results of the analysis of the effect of the effectiveness of subsidized fertilizers to improve farmer welfare. From the path coefficient table, it shows that the results that have a significant effect at a and b = 0.05 and 0.1 are the livelihood asset variables, namely human capital, social capital, financial capital, natural capital, and physical capital.

The ability of individuals to gain better access to their living conditions (Wijayanti et al., 2016). Social capital is part of human assets that enables individuals in a group to trust each other, cooperate, and be actively involved in group formation. Social capital refers to social relationships such as trust, social control, commitment, and discipline (Zainal et al., 2020). Physical capital refers to basic infrastructure and other facilities built to support the community's livelihoods (Prihandini, 2017). Natural capital refers to natural resources that provide support and benefit to human livelihoods. In this case, natural capital includes land resources (Wijayanti et al., 2016). Financial capital refers to financial resources used to achieve their livelihood goals (Elizondo et al., 2017). These five forms of capital have significantly influencing the effectiveness of subsidized fertilizer distribution. The effectiveness of subsidized fertilizer distribution has a significant effect on farmer welfare, butextension worker performance does not have a significant effect on livelihood assets with distribution effectiveness. Agricultural extension worker performance is the work achievement attained by an extension worker in accordance with their main duties and functions (Rahmawati, 2021). Distribution effectiveness is a measure of the success or failure of achieving goals based on the subsidized fertilizer policy (Prawin et al., 2022). Meanwhile, farmer welfare is measured by the level of income and the amount of farm production, which can be quantified in rupiah per season (Hartati et al., 2017).

From the path coefficient table, it shows that the results that have a significant effect at a and b = 0.05 and 0.1 are that the livelihood asset variable has a positive and significant effect on the effectiveness of subsidized fertilizer distribution. The effectiveness of subsidized fertilizer distribution has a positive and significant effect on farmer welfare. Livelihood assets have a positive and significant effect on farmer welfare. The findings of this study are consistent with the research by Yazdanpanah et al. (2021), which analyzed the impact of livelihood assets on the welfare of smallholder farmers in Malawi. The study showed that human capital, social capital, physical capital, and financial capital have a significant impact on farmers' income and food security.

The results of this study are also in line with the findings of Chuong et al. (2024), which examined the influence of livelihood assets on livelihood strategies among smallholder farmers in Vietnam. This study showed that human capital, social capital, physical capital, natural capital, and financial capital significantly affect farmers' ability to improve their welfare. There is also a study by Khanal et al. (2021), which states that human capital, social capital, physical capital, natural capital, and financial capital significantly influence farmers' income and their ability to escape poverty as an indicator of welfare.

Table 4. The Analysis of the Effect of the Effectiveness of Subsidized Fertilizers

Variable	Original Sample (O)	T Statistics (IO/STDEVI)	P Value
Y1=> Y2	0.602	6.432	0.000 [a]
X => Y1	0.422	3.912	0.000 [a]
X=> Y2	0.260	2.612	0.009 [a]

Source: Primary Data, Processed 2024; a and b are significant at 0.01 and 0.05 levels respectively

R Square

Testing R-Square (R2) is a way to measure the goodness of a structural model. The R-Square (R2) value is used to assess how much influence a particular independent latent variable has on the dependent latent variable. The criteria for the R-square value are 0.75, which can be said that the model is strong, an R-square value of 0.50 means the model is moderately categorized, and if the R-square value is 0.25, the model is weak (Ghozali et al., 2015).

Based on the table, it shows that the R Square for Livelihood Assets has a value of 1,000, which means strong. The R Square for Distribution Effectiveness has a value of 0.326, which means weak, while the R Square for Farmer Welfare has a value of 0.594, which means Moderate.

Table 5. R-square

Variable	R- Square	Description
X	1.000	Strong
Y1	0.326	Weak
Y2	0.594	Moderate

Source: Primary Data, Processed 2024

F-Square

F-Square shows a measure of the significance of research results in the form of a measure of the strength of correlation, or the effect of one variable on another.

Table 6. F-square

Variable	F Square	Description
Y1 => Y2	0.652	Large
X => Y1	0.227	Medium
X =>Y2	0.122	Small

Source: Primary Data, Processed 2024

Based on the analysis table above, it shows that the performance of extension workers on distribution effectiveness is said to have no effect because the f-square value is less than 0.020. Physical capital and human capital on distribution effectiveness are said to be small because the f-square value is less than 0.15. According to Sarstedt et al. (2007), it is stated that if the f-square value is 0.02, it is considered small, a value of0.15 is considered moderate, a value of 0.35 is considered large, and if the value is less than 0.02, it is considered or deemed to have no effect.

The F Square value of distribution effectiveness on farmer welfare has a value of 0.652, which is in the large category. The F Square value of livelihood assets on distribution effectiveness has a value of 0.227, which has a moderate effect on the latent variable. The F Square value of livelihood assets on farmer welfare has a value of 0.122, which is in the small category.

Interpretation of the Correlation between the Effectiveness of Subsidized Fertilizers and Welfare

Livelihood assets have a positive and significant effect on farmer welfare. This is because the t-statistic value is more than 1.96, so it is significant, and the P-value is below 0.05, and H1 is accepted. The influence of livelihood assets on farmer welfare is considered important because it is one of the determining factors for the success of farmers in supporting their business. In human assets, skills and knowledge play an important role in the success of their business. Farmers with good knowledge will manage their business effectively and efficiently to increase agricultural productivity, which will ultimately result in optimal results. Social assets related to social and networks can support important facilities in agriculture. Farmers with compactness and support from fellow farmers can overcome any challenges they face. Natural assets such as soil content can support plant growth, which can have a better chance of achieving good results. Financial capital is important in managing farming. Farmers with good access to capital can buy seeds, fertilizers, and agricultural equipment as needed to increase agricultural business efficiency. Physical assets used in production include access to information and land area, affecting their ability to work and manage their agriculture properly. Overall, all of these assets are interrelated and influence the determination of farmer welfare. In this study, livelihood assets had a positive and significant effect on farmer welfare by 26%.

Table 7. The Effectiveness of Subsidized Fertilizer Distribution in Wedi Village

Indicator	Quantity	Percentage (%)	Category
Right Type	410	66	Effective
Right Amount	410	61	Effective
Right Price	820	70	Effective
Right Place	2050	68	Effective
Right Time	410	64	Effective
Right Quality	1230	74	Effective

Source: Primary Data, Processed 2024

The research findings are in line with research by Yazdanpanah et al. (2021), which analyzed the influence of livelihood assets on the welfare of small farmers in Malawi. The research showed that human capital, social

capital, physical capital, and finance had a significant influence on farmers' income and food security. Livelihood assets have a positive and significant effect on the effectiveness of distribution. This is because the t-statistic value is more than 1.96, so it is significant, and the P-value is below 0.05, and H2 is accepted. In the indirect testing of the livelihood asset variable on farmer welfare mediated by the distribution effectiveness variable. Antwi-Agyei et al. (2021) examined the correlation between the livelihood assets of small farmers in Kenya. The research results showed that farmers with larger livelihoods, especially human capital and social capital, tended to have more effective access to distribution. The effectiveness of subsidized fertilizer distribution has a positive and significant mediating effect on the correlation between livelihood assets and farmer welfare. This is because the t-statistic value is more than 1.96, so it is significant, and the P-value is below 0.05, and H3 is accepted. In this study, it is known that the effectiveness of subsidized fertilizer distribution has a positive and significant effect on farmer welfare in mediating the correlation between livelihood assets and farmer welfare. This is in line with research by Kaoma et al. (2023), which states that the effectiveness of the subsidy program distribution mediates the correlation between the livelihood assets owned by farmers and increased productivity, income, and farmer welfare. Farmers with more livelihood assets tend to participate more in subsidy programs and are effective in their utilization. The research results show that the effectiveness of distribution has a positive and significant effect. The research results show that the effectiveness of subsidized fertilizer distribution in Wedi Village, namely the right amount, right price, right time, and right quality, is quite effective.

Farmer Welfare Improvement Strategy

Given the characteristics of the livelihood asset variable (X), it is evident that human capital, social capital, natural capital, physical capital, and financial capital have a positive and significant impact on distribution effectiveness (Y1). The first indicator, social capital, has the highest influence on livelihood assets, with a path coefficient value of 0.387 and a t-statistic value of 22.964 (significant at p-value <0.05). Strengthening farmers' social capital is shown to have the highest impact on livelihood assets. Therefore, strategies to enhance farmers' social capital should be prioritized, such as encouraging the formation of strong and active farmer groups, increasing institutional capacity and partnerships between farmers and relevant parties, and enhancing institutional capacity through training and assistance.

The improvement of livelihood assets (X) has a positive and significant impact on farmers' welfare (Y2), with a path coefficient of 0.260. Strategies undertaken to improve this should recognize that social capital plays an essential role in enhancing livelihood assets. Increasing human capital will positively influence the value of livelihood assets, thereby positively impacting farmers' welfare.

Enhancing the effectiveness of subsidized fertilizer distribution (Y1) has a positive and significant impact on farmers' welfare (Y2), with a path coefficient of 0.602. Strategies to be adopted include improving the fertilizer distribution system to ensure the correct quantity, price, location, timing, quality, and type. For example, mapping the needs of farmers by identifying the number of farmers, land ownership areas, calculating the required fertilizer needs in the village, and involving farmer groups and village officials. Establishing fertilizer storage at the village level by providing adequate warehouses or storage facilities. Improving the fertilizer distribution system by scheduling regular and timely deliveries to the village. Ensuring the quantity, type, and quality of the delivered fertilizer meet the village's needs. Implementing an integrated fertilizer sales system in the village according to e-allocation data by establishing kiosks or fertilizer sales units managed by village officials or farmer groups and maintaining fertilizer availability at the kiosks to always meet the needs, while controlling the selling price of fertilizer in line with the highest retail price (HET).

The results show that the moderating variable of agricultural extension workers' performance does not have a moderating effect on the relationship between livelihood assets and distribution effectiveness, with a path coefficient value of -0.085 and a significance p-value of 0.169, indicating that it is not significant. The performance of agricultural extension workers is considered ineffective in enhancing distribution effectiveness, partly due to the educational limitations of the farmers, which makes the role of extension workers less aligned with the farmers' needs. The role of extension workers includes facilitating extension activities, such as providing education on farming practices and encouraging farmers to implement changes to advance their agricultural enterprises. As initiators, extension workers can assist farmer groups in utilizing their knowledge to enhance the effectiveness of subsidized fertilizer distribution (Khairunnisa et al., 2021).

In Desa Wedi, the efforts of extension workers in providing training to farmers have not been effectively implemented. This is due to the low education levels of the farmers and the difficulty in absorbing the training materials, leading to an assessment that the role of extension workers is less effective. One of the barriers to effective training is the limited education of the farmers, which makes the role of extension workers less aligned

with the farmers' needs. According to research by Subagio et al. (2019), the motivation and performance of agricultural extension workers are considered less effective due to poor coordination, low farmer participation in extension activities, inadequate mastery of material, and limited field experience.

The solution is to adjust the training materials to match the education and understanding levels of the farmers. The training materials should be presented in a language that is easy to understand and relevant to the farmers' conditions. Interactive learning methods such as group discussions and easy-to-understand visuals should be employed. Continuous training sessions are necessary to reinforce the knowledge provided. A personal approach should be taken by direct communication, field visits to understand the farmers' needs and challenges, and providing guidance that is relevant to the current conditions.

Conclusion

The livelihood asset variable has a significant and positive impact on the welfare of respondent farmers, accounting for 26%. Therefore, it can be said that the better the livelihood assets, the more capable they are of improving farmers' welfare. The effect of distribution effectiveness has a mediating effect on the relationship between livelihood assets and welfare, with a significant positive impact on the relationship between livelihood assets and farmers' welfare, accounting for 60%.The research results show that the effectiveness of subsidized fertilizer distribution in Wedi Village has the most significant direct impact on improving welfare compared to the mediating effect of distribution effectiveness on the relationship between livelihood assets and welfare. The better the effectiveness of the distribution, including the correct quantity, price, timing, and quality, the greater the impact on farmers' welfare. The performance of agricultural extension workers moderates the relationship between livelihood assets and distribution effectiveness. The analysis results show a negative path coefficient and a p-value of less than 0.05, indicating that the performance of extension workers has a negative but not significant moderating effect on the relationship between livelihood assets and distribution effectiveness, accounting for 8%. Thus, it can be concluded that changes in extension workers' performance do not affect the relationship between livelihood assets and distribution effectiveness. Strengthening farmers' social capital has the highest impact on livelihood assets. Therefore, strategies to strengthen farmers' social capital should be prioritized, such as encouraging the formation of strong and active farmer groups, increasing institutional capacity and partnerships with relevant parties, and enhancing institutional capacity through training and assistance. Improving the effectiveness of subsidized fertilizer distribution (Y1) has a significant and positive impact on farmers' welfare (Y2), so strategies include improving the fertilizer distribution system to ensure the correct quantity, price, location, timing, quality, and type. The performance of extension workers is considered ineffective in improving distribution effectiveness due to one of the barriers being the farmers' limited education. The solution is to adjust training materials to match farmers' education and understanding levels, conduct continuous training sessions, and adopt a personal approach.

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Author Contributions

Conceptualization, N.S.Y, S.M., R.I.; methodology, N.S.Y, S.M., R.I.; validation, N.S.Y, S.M., R.I.; formal analysis, N.S.Y..; investigation, N.S.Y.; resources, N.S.Y, S.M., R.I.; data curation, N.S.Y.: writing—original draft preparation, N.S.Y.; writing—review and editing, N.S.Y, S.M., R.I.; visualization, N.S.Y, S.M., R.I.;. All authors have read and agreed to the published version of the manuscript.

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