Jurnal Triton, Vol. 14 No. 2 (December, 2023) : 583-600
e ISSN : 2745-3650, p ISSN : 2085-3823
DOI: https://doi.org/10.47687/jt.v14i2.509

JURNAL TRITON
journal homepage: *http://jurnal.polbangtanmanokwari.ac.id*

Farmers' Perceptions of Extension Officers' Role in the Agricultural Development Strategy Command (KOSTRATANI) Program

Norbertus Citra Irawan[1]*
[1]Tunas Pembangunan University, Surakarta, Indonesia

INFORMATION

Article history
Accepted 05/06/2023
Received in revised form 26/09/2023
Accepted and approved 20/10/2023
Available online 22/12/2023

Keywords
Agricultural development
Extension officers role
Farmers' perception
Kostratani
Policy

ABSTRACT

Tantangan dalam program KOSTRATANI, antara lain adalah masalah koordinasi dan keterbatasan sumber daya, mempengaruhi persepsi petani. Penelitian ini bertujuan untuk mengetahui persepsi petani terhadap peran penyuluh pertanian pada Program Komando Strategi Pembangunan Pertanian (KOSTRATANI) di Boyolali. Metode penelitian yang digunakan adalah deskriptif analitis dengan pendekatan kuantitatif dan kualitatif. Lokasi penelitian dipilih secara purposif di Kecamatan Cepogo, Selo, dan Musuk yang anggota kelompok taninya lebih dari 200 orang. Sampel penelitian diambil secara *simple random sampling*, yaitu sebanyak 150 responden petani dilibatkan dalam penelitian ini. Hasil penelitian menunjukkan adanya variasi persepsi petani terhadap peran penyuluh pertanian, mayoritas responden setuju dengan kontribusi penyuluh pada aspek yang diteliti. Namun ada juga sebagian petani yang mempunyai persepsi negatif terhadap peran penyuluh. Untuk mengatasi persepsi negatif tersebut, diperlukan inovasi dan strategi yang dapat meningkatkan efektivitas konseling. Penyuluh pertanian perlu memperkuat pengetahuan dan keterampilannya dalam memberikan pendampingan kepada petani, khususnya dalam aspek ekonomi, sosial, dan lingkungan. Dalam hal ini penyuluh dapat melakukan pendekatan komunikasi yang lebih terbuka, melibatkan petani dalam pengambilan keputusan, dan memanfaatkan inovasi teknologi informasi dan komunikasi untuk meningkatkan akses petani terhadap informasi dan sumber daya. Rekomendasi kebijakan dan strategi tersebut diharapkan dapat memperkuat peran penyuluh pertanian dalam mendukung pembangunan pertanian berkelanjutan dan meningkatkan kesejahteraan petani.

*Corresponding Author Email : irawan@lecture.utp.ac.id
irawan@lecture.utp.ac.id[1]

ABSTRACT

Challenges in the KOSTRATANI program, including coordination issues and resource limitations, affect farmers' perceptions. This study aims to understand farmers' perceptions of the role of agricultural extension workers in the Agricultural Development Strategy Command Program (KOSTRATANI) in Boyolali. The research method used is analytical descriptive with quantitative and qualitative approaches. The research locations were selected purposively in Cepogo, Selo, and Musuk sub-districts with more than 200 farmer group members. The research sample was taken by simple random sampling, in which 150 farmer respondents were involved in this study. The results showed variations in farmers' perceptions of the role of agricultural extension agents, with most respondents agreeing with the contributions of extension agents in the aspects studied. However, some farmers negatively perceive the role of extension workers. To overcome this negative perception, innovation and strategies are needed that can increase the effectiveness of counselling. Agricultural extension workers need to strengthen their knowledge and skills in providing assistance to farmers, especially in economic, social and environmental aspects. In this case, extension agents can adopt a more open communication approach, involve farmers in decision-making, and utilize information and communication technology innovations to increase farmers' access to information and resources. These policy and strategy recommendations are expected to strengthen the role of agricultural extension workers in supporting sustainable agricultural development and improving farmers' welfare.

INTRODUCTION

Agriculture is vital in economic and social development in many countries, including Indonesia. As an agricultural country, the agricultural sector has great potential to improve farmers' welfare and ensure the food supply's sustainability. However, farmers often face challenges in the face of environmental change, new technologies, and evolving agricultural policies. Improving farmers' knowledge and abilities will help solve this problem (Antwi-Agyei & Stringer, 2021; Streimikis & Baležentis, 2020; Sulaiman *et al*., 2019).

In supporting efforts to improve farmers' knowledge and skills, the Indonesian Ministry of Agriculture has issued Regulation of the Minister of Agriculture Number 49 of 2019 concerning the Strategic Command for Agricultural Development (KOSTRATANI). This regulation aims to provide a solid legal foundation for implementing the KOSTRATANI program throughout Indonesia. KOSTRATANI aims to improve agricultural productivity, farmer welfare, and national food security (Anugrah & Wahyuni, 2023). In order to achieve this goal, agricultural extension workers have a significant role. Agricultural extension workers liaise with the government, farmers, and other stakeholders. They provide farmers with technical guidance, information, and training to improve sustainable agricultural practices (Salman *et al*., 2023).

Problems can influence farmers' perceptions of agricultural extension workers' role in implementing the KOSTRATANI program, such as a lack of coordination between related parties, limited resources and facilities, technical and technological challenges, environmental uncertainty, and unfair distribution of benefits. These problems may stimulate the interest of researchers in conducting more in-depth studies. Farmers' inability to deal with change and systemic problems in program implementation encourages researchers to understand farmers'

perceptions better, identify existing obstacles, and provide policy and strategy recommendations that can increase the effectiveness and impact of the KOSTRATANI program in supporting farmers and sustainable agricultural development. The mismatch between program objectives and realities on the ground, farmers' inability to deal with change, and systemic problems in program implementation encourage researchers to understand better farmers' perceptions (Aryawiguna *et al*., 2021; Safitri *et al*., 2023; Siebrecht, 2020).

Problems related to the role of extension workers in the KOSTRATANI program can affect the effectiveness and success of the program. One of the problems that may arise is the lack of coordination between agricultural extension workers and farmers, which can hinder the transfer of knowledge and skills farmers need. In addition, limited resources, such as funds and facilities, can limit farmers' access to assistance and guidance from agricultural extension workers. The inability of agricultural extension workers to convey information in a relevant and understandable way to farmers can also hinder the effectiveness of communication and program implementation. In addition, unpredictable environmental and climate changes can also affect the role of agricultural extension workers in providing solutions and support appropriate to changing agricultural conditions. Therefore, it is essential to overcome these problems so that the role of agricultural extension workers in the KOSTRATANI program can run optimally and significantly impact farmers and agricultural development (Maulu *et al*., 2021; Raj & Garlapati, 2020; Savelli *et al*., 2021; Sudaryanto *et al*., 2022).

This study aimed to understand farmers' perceptions of the role of agricultural extension workers in the KOSTRATANI in Boyolali. This study aims to identify factors that influence farmers' perceptions, analyze the effectiveness of the role of agricultural extension workers in the KOSTRATANI program, and provide policy recommendations and strategies that can improve the program's implementation. With a deeper understanding of farmers' perceptions, this research is expected to make scientific contributions to developing more effective and sustainable agricultural policies, improving the quality of agricultural extension services, and supporting the improvement of farmers' welfare and agricultural development in Boyolali Regency. The results of this study can also be a reference for the government, agricultural extension agencies, and related stakeholders in optimizing the role of agricultural extension workers and improving the implementation of the KOSTRATANI Program in the region.

Thus, this research is expected to significantly contribute to strengthening the implementation of the KOSTRATANI Program in Boyolali and help achieve the goals of sustainable agricultural development. In addition, this research can also provide a broader understanding of the role of agricultural extension workers in the context of similar programs in other regions in Indonesia. With a more profound knowledge of farmers' perceptions, agricultural programs can be

designed and implemented more effectively, providing optimal benefits for farmers, communities, and the country as a whole.

METHODOLOGY

This research uses basic descriptive-analytical methods involving quantitative and qualitative approaches. A quantitative approach is used to collect numerical data and analyze it statistically to describe and explain farmers' perceptions of the role of agricultural extension workers in the KOSTRATANI Program. Meanwhile, a qualitative approach is used to gain a deeper understanding of farmers' perceptions through in-depth interviews, observations, and thematic analysis. The combination of these two approaches provides a comprehensive analytical framework to answer research questions and results in a deeper understanding of the role of agricultural extension workers in the context of the KOSTRATANI Program in Boyolali.

This study used a purposive location determination method by selecting Cepogo, Selo, and Musuk sub-districts with some farmer group members above 200. The choice of location was based on the consideration that these sub-districts have a strong level of organization in the form of active farmer groups involved in agricultural activities. This study collected representative data from different farmer groups by involving sub-districts with many farmer groups. This study will enable a more comprehensive analysis of farmers' perceptions of the role of agricultural extension workers in the KOSTRATANI Program in Boyolali and gain a deeper understanding of the factors influencing these perceptions.

This study has a farmer population consisting of three farmer groups above the middle, namely Budoyo Tani I Farmer Group in Wonodoyo, Cepogo; Argo Ayuning Tani Farmer Group in Senden, Selo; and Ngudi Mulyo Farmer Group in Kebongulo, Musuk. This population selection was carried out based on the consideration that the three farmer groups have an active role in agricultural activities in their respective regions. By selecting farmer populations from these three farmer groups, this study was able to describe the different variations and characteristics of farmers and gain deeper insight into their perceptions of the role of agricultural extension workers in the KOSTRATANI Program in Boyolali District.

This study used a simple random sampling method, where each farmer group randomly selected 50 respondents, so the total number of respondents involved in this study was 150. This approach is used to ensure that the samples taken are representative of the farming population in each farmer group fairly and randomly. The study collected comprehensive data and enabled fair comparisons between farmer groups by involving the same number of respondents from each farmer group. Thus, this study can provide a more complete and representative picture of farmers' perceptions of the role of agricultural extension workers in the KOSTRATANI Program in Boyolali.

Data collection in this study was carried out through survey, interview, and observation

methods. The survey method is used to collect data from respondents using questionnaires that have been prepared. The interviews were used to gain in-depth information and a more detailed understanding of farmers' perceptions of the role of agricultural extension workers. Observations are made to observe agricultural activities directly, interactions between farmers and agricultural extension workers, and contextual factors influencing farmers' perceptions. Through a combination of these three methods, this study obtained richer and more in-depth data on farmers' perceptions of the role of agricultural extension workers in the KOSTRATANI Program in Boyolali.

In this study, respondents' answers will be measured using the Likert scale, which consists of five levels of answers. This Likert scale consists of 1 = Strongly Disagree, 2 = Disagree, 3 = Simply Agree, 4 = Agree, and 5 = Strongly Agree. The Likert scale allows respondents to express their approval or disapproval of the statement or question posed. This measure helps researchers describe respondents' ideas and perceptions. The Likert scale provides a precise measurement framework. It allows researchers to analyze data quantitatively to produce more comprehensive information about respondents' perceptions of the topic under study. Following the Regulation of the Minister of Agriculture No. 49 of 2019, article 1, paragraph 7 states that there are nine roles of extension workers in the strata, which are then used as variables in this study, namely:

X1 = The role of extension workers is to assist farmers in accessing market information

X2 = The role of extension workers is to assist farmers in the adoption of information and communication technology

X3 = The role of extension workers in helping farmers access capital

X4 = The role of extension workers in helping farmers access resources

X5 = The role of extension workers in helping farmers in increasing productivity

X6 = The role of extension workers helps farmers in business efficiency

X7 = The role of extension workers in helping farmers increase income

X8 = The role of extension workers in helping farmers improve welfare

X9 = The role of extension workers in assisting farmers in raising environmental awareness

This study uses questionnaire validity and reliability tests to ensure the instruments used can measure research variables well. A validity test evaluates how much the questionnaire can accurately measure the construct (Flake & Fried, 2020). This test examines the relationship between the questionnaire's variables and those established in previous theories or research. Meanwhile, reliability tests assess the consistency and reliability of measurement instruments by examining the extent to which questionnaires produce consistent results when given to the same respondents at different times (Sürücü & Maslakçi, 2020). By conducting validity and reliability tests, this study can ensure that the

questionnaire used is a valid and reliable tool to collect accurate and reliable data in the analysis and interpretation of research results.

The validity test is carried out by correlating the question item's score with the construct or variable's total score. If the calculated correlation coefficient (r) is greater than the critical value (r of the table) and has a positive direction, then the question is considered valid. In this context, the validity test aims to measure the extent to which the questions in the questionnaire accurately represent the variable being measured. By conducting a validity test, this study can ensure that each question in the questionnaire is a valid and trustworthy instrument to collect data following the research objectives. Kaur *et al.* (2020) write that validity analysis uses the product moment correlation technique from Karl Pearson with the following formula:

$$r_{xy} = \frac{N(\sum XY) - (\sum X \,.\, \sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

Information:

rxy = Product moment correlation coefficient

N = Number of respondents

X = Score the x-number statement in the questionnaire

Y = Total score of statement number y in the questionnaire

This study used a reliability test using the Cronbach-alpha technique to measure the reliability of instruments that scored 1-5. The Cronbach-alpha technique is commonly used for calculating measurement instruments' internal consistency or reliability (Amirrudin *et al.*, 2021). The formula used to calculate Cronbach-alpha is as follows:

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum \sigma b^2}{\sigma t^2}\right)$$

Information:

r11 = Instrument reliability

k = many question items or statements

σ_b^2 = Total variance

$\Sigma\, \sigma_b^2$ = Number of grain variances

The correlation coefficient between one item and its overall score, r11, must be compared to the instrument's minimum dependability criteria to verify reliability. In this case, the instrument is considered reliable if the reliability coefficient (r11) value exceeds 0.60. If the value of r11 is more significant than 0.60, then the instrument is considered to have a high level of reliability, indicating good internal consistency between the items in the instrument. Data collection and statistical analysis are recommended for instrument trials to assure validity and reliability. By conducting trials, it can obtain the necessary data and ensure that the instrument can be accounted for in measuring the studied construct (Saidi & Siew, 2019).

RESULTS AND DISCUSSION

Validity and Reliability Test

Table 1. Question Item Validity Test Results

Variable	Corrected Item-Total Correlation	r table	Decision
X1	0.564	0.174	Valid
X2	0.502	0.174	Valid
X3	0.474	0.174	Valid
X4	0.739	0.174	Valid
X5	0.609	0.174	Valid
X6	0.661	0.174	Valid
X7	0.649	0.174	Valid
X8	0.676	0.174	Valid
X9	0.742	0.174	Valid

Based on Table 1, the results of the question item validity test using an r count of 0.174 (for df=88) show valid results, and this indicates that all questions in the research instrument can effectively measure variables related to farmers' perceptions of the role of agricultural extension workers in the strategic program. Valid results show that the instrument used has been proven to have accuracy and consistency in measuring the construct to be studied. Thus, this study can provide reliable and accountable findings in answering research questions related to farmers' perceptions of the role of agricultural extension workers in strategic programs.

Table 2. The Results of the Reliability Test of the Question Items

Variable	Cronbach's Alpha	Critical Value	Information
X1	0.734	0.600	Reliable
X2	0.742	0.600	Reliable
X3	0.744	0.600	Reliable
X4	0.722	0.600	Reliable
X5	0.734	0.600	Reliable
X6	0.729	0.600	Reliable
X7	0.730	0.600	Reliable
X8	0.728	0.600	Reliable
X9	0.722	0.600	Reliable

Based on Table 2, the results of the variable reliability test using Cronbach's Alpha critical value of 0.6 showed that nine variables in this study had good reliability. This result indicates that the measuring tools used in collecting data on farmers' perceptions of the role of agricultural extension workers in the strategic program are consistent and reliable. With high reliability, it can be ensured that the questions in the research instrument provide consistent and accurate results in measuring the variables studied. These results give confidence

to researchers that the data obtained through these measuring instruments can be accounted for and provide reliable information in answering research questions related to farmers' perceptions of the role of agricultural extension workers in the strategic program.

Perception of the Role of Extension Workers in Helping Access to Market Information (X1)

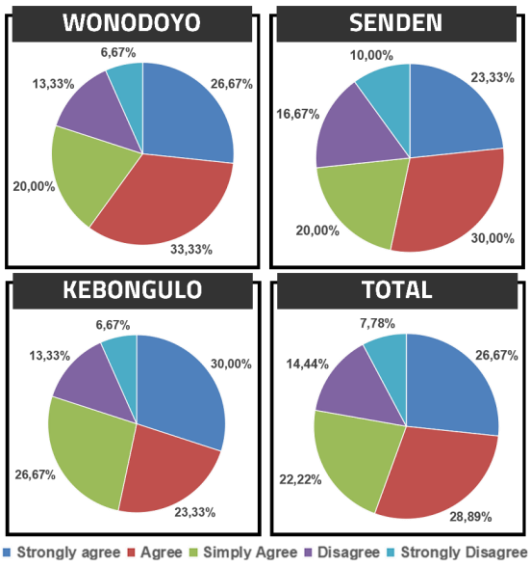

Figure 1. Farmers' perceptions of the role of extension workers in helping access market information

Based on the Regulation of the Minister of Agriculture No. 49 of 2019, the role of extension workers in the first kostratani is to assist farmers in accessing market information. Based on Figure 1, the frequency of farmers' perceptions of the role of agricultural extension workers in helping access market information is obtained. Most respondents agreed or strongly agreed (55.56 percent) that agricultural extension workers play a role in helping access market information. In contrast, a small percentage of respondents (22.22 percent) felt quite agree, while a lower percentage disagreed (14.44 percent) or strongly disagreed (7.78 percent). These results show that most farmers have a positive perception of the role of agricultural extension workers in providing access to market information.

However, not all farmers may fully understand this role, and this can affect farmers' perceptions of extension workers. Sometimes, farmers may be less aware of the importance of market information and how extension workers can help them with this. Therefore, extension workers must communicate their role effectively to farmers, explain the benefits of market information, and better understand how cooperation with extension workers can support their agricultural enterprises. With a better understanding, it is hoped that farmers' perceptions of the role of extension workers in the strategy can be improved so that farmers can better use market information and increase their agricultural business results.

The role of extension workers in the Konstratani program is to provide farmers with

an understanding of market conditions, consumer demand, price trends, and existing market opportunities. Extension workers can also provide information related to marketing strategies, product packaging, and opportunities for cooperation with other parties in the agricultural supply chain. Farmers can make better decisions in managing their business by having good access to market information, including producing, distributing, and marketing agricultural products. Thus, the role of extension workers in the strategy becomes essential in helping farmers increase competitiveness and optimize the economic value of their agricultural businesses.

Perception of the Role of Extension Workers in Assisting the Adoption of Information and Communication Technology (ICT) (X2)

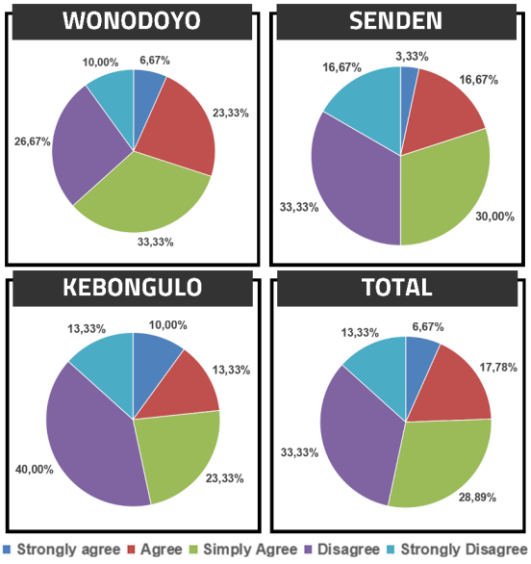

Figure 2. Farmer perceptions of the role of extension workers in assisting ICT adoption

Based on Figure 2, the frequency of farmers' perceptions of the role of agricultural extension workers in assisting the adoption of Information and Communication Technology (ICT) is obtained. Most respondents (55.56 percent) agreed or moderately agreed that agricultural extension workers play a role in helping ICT adoption. However, a significant percentage (46.67 percent) of respondents disagree or strongly disagree with the role of extension workers. This result indicates a difference in farmers' perceptions and acceptance of ICT adoption provided by agricultural extension workers. In the context of research that focuses on farmers' perceptions of the role of agricultural extension workers in strategic programs, these results illustrate that there are challenges in introducing and facilitating the adoption of ICT technology for farmers. Therefore, agricultural extension workers need to increase understanding, provide intensive assistance, and communicate the benefits and uses of ICT technology to farmers to increase adoption and use in their agricultural practices.

Perception of the Role of Extension Workers in Helping Access to Capital (X3)

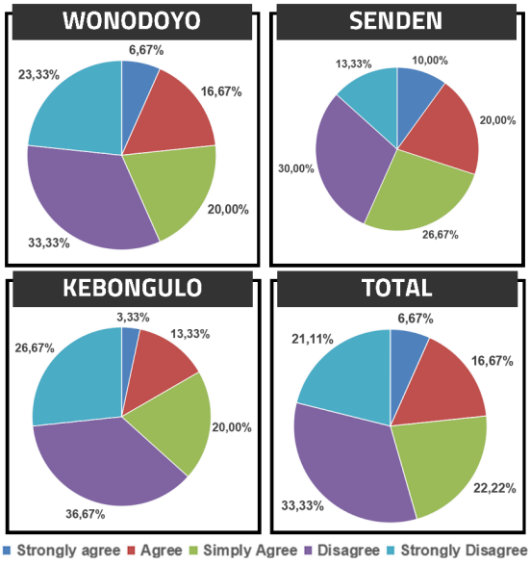

Figure 3. Farmers' perceptions of the role of extension workers in helping access capital

Based on Figure 3, the frequency of farmers' perceptions of the role of agricultural extension workers in helping access capital is obtained. Most respondents (54.44 percent) disagreed or strongly disagreed that agricultural extension workers play a role in helping access capital. In contrast, only a tiny percentage of respondents (45.56 percent) agreed or moderately agreed with the role. These results indicate that farmers' perceptions of the role of agricultural extension workers in helping access to capital are still low. In the context of research related to farmers' perceptions of the role of agricultural extension workers in strategic programs, these results indicate the need to increase the role of extension workers in providing information and assistance related to access to capital to farmers. Agricultural extension workers need to increase understanding and assistance to farmers by providing clear information about available sources of capital, application procedures, and agricultural financial management strategies. As a concrete example of assistance in access to capital, an agricultural extension worker can work with farmers to help them access loans from microfinance institutions. For example, agricultural extension workers can assist farmers in developing solid business plans, compiling accurate financial statements, and presenting attractive proposals to financial institutions. In addition, agricultural extension workers can assist farmers in organizing the documents needed for loan applications and providing guidance on the application process and the requirements that must be met. Farmers can have better access to the capital they need to develop their agricultural businesses through this assistance.

Perception of the Role of Extension Workers in Helping Access Resources (X4)

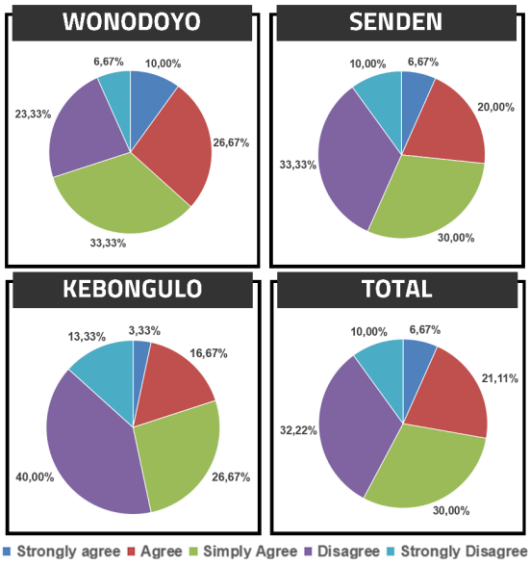

Figure 4. Farmers' perceptions of the role of extension workers in helping access resources

Based on Figure 4, it can be seen that most respondents have a positive perception regarding the role of agricultural extension workers in helping access resources. Although there is a significant percentage of respondents who disagree or strongly disagree, the majority of respondents agree or entirely agree. This result indicates that agricultural extension workers have contributed to helping farmers access the resources needed for their agricultural activities.

However, about 42.22 percent of respondents still do not feel access to resources in agriculture, which shows a problem that needs attention. Some factors that may cause negative perceptions of agricultural extension workers are limited information and communication regarding the role of extension workers, lack of coordination between extension workers and farmers, limited extension resources such as time and facilities, and environmental factors that affect access to resources. In addition, differences in perceptions between farmers and extension workers regarding needs, priorities, or expectations in resource access can also influence negative perceptions.

In the context of agricultural extension workers' assistance in accessing agricultural resources, extension workers can provide technical support in procuring resource inputs needed in agricultural activities. This result includes seeds, fertilizers, pesticides, agricultural equipment, and production technology. Extension workers can assist farmers in understanding the right type and quality of inputs and provide information on where and how to obtain them at competitive prices. In addition, extension workers can guide the effective and efficient use of these resource inputs, including dosage selection, application methods, and optimal usage schedules. With this kind of technical assistance, farmers are expected to increase the productivity and efficiency of their farms through better access to relevant resource inputs.

Perception of the Role of Extension Workers in Increasing Productivity (X5)

Based on Figure 5, it can be seen that most respondents (in a significant percentage) agree or entirely agree with the role of agricultural extension workers in helping to increase farm productivity. This result shows farmers' awareness and appreciation for extension workers' contribution to productivity improvement. Although a small percentage of respondents disagree or strongly disagree, the proportion is relatively small compared to those who agree.

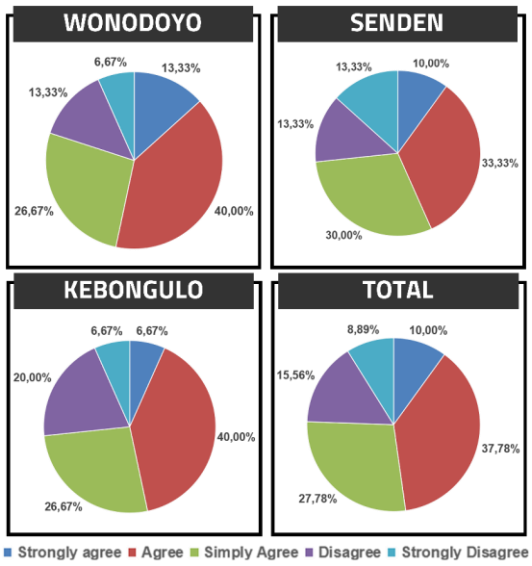

Figure 5. Farmers' perceptions of the role of extension workers in increasing productivity

Therefore, these results show an essential need for agricultural extension workers to continue providing assistance and relevant information, technology, and guidance to assist farmers in increasing farm productivity. In addition, it is necessary to periodically evaluate the efforts and strategies carried out by extension workers to ensure the effectiveness and relevance of their role in the strategy. Thus, agricultural extension workers can continue to play an active role in assisting farmers in increasing farm productivity following the research title related to farmers' perceptions of the role of extension workers in the strategic program.

Perception of the Role of Extension Workers in Improving Farm Efficiency (X6)

Based on Figure 6, it can be seen that most respondents (in a significant percentage) agree or entirely agree with the role of agricultural extension workers in helping to improve farm efficiency. This result shows that farmers have a positive perception of the contribution of extension workers in helping them achieve efficiency in farming activities.

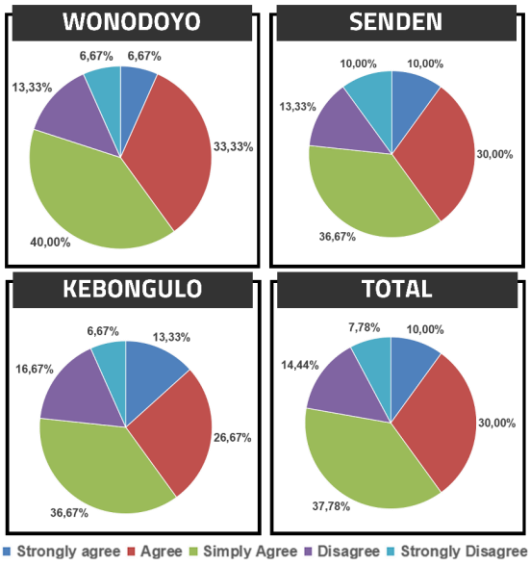

Figure 6. Farmers' perception of the role of extension workers in improving farm efficiency

Although a small percentage of respondents disagreed or strongly disagreed, the proportion was relatively small compared to those who agreed. These results show recognition of the role of extension workers in helping farmers improve efficiency in various aspects of farming, such as resource use, time management, and technology use.

To increase the positive perception of respondents who still have a reasonably lovely view regarding the role of agricultural extension workers in the strategy of 22.22 percent, agricultural extension workers need to take several actions. First, they can actively provide clear and comprehensive information about the tangible benefits of the role of extension workers in improving farm efficiency that can be obtained. Furthermore, extension workers can conduct interactive training and workshops to help farmers understand and apply best practices in the strategy. It is also vital for extension workers to keep their knowledge and skills updated to provide relevant solutions and advice in today's agricultural context. In addition, extension workers need to get closer to farmers, get to know their needs and challenges personally and provide continuous assistance to ensure successful implementation. These approaches are intended to improve extension worker-farmer collaboration and increase positive opinions of their participation in the strategy.

Perception of the Role of Extension Workers in Increasing Farm Income (X7)

Based on Figure 7, it can be seen that most respondents have a positive perception regarding the role of agricultural extension workers in increasing income. A significant percentage of respondents agreed (30 percent) and moderately agreed (26.67 percent) with the role. However, some respondents disagree (23.33 percent) and strongly disagree (10 percent) with the role of extension workers in increasing income. This result shows variations in farmers' perceptions of the contribution of agricultural extension workers to increasing income. As agricultural extension workers, they need to understand better the needs and

challenges farmers face in increasing income. They must provide accurate and relevant information on revenue generation strategies and appropriate mentoring and guidance. In addition, extension workers can facilitate farmers' access to assistance or training programs that can help them improve their farming skills and efficiency. Thus, agricultural extension workers can play an essential role in helping farmers increase their incomes following strategic objectives.

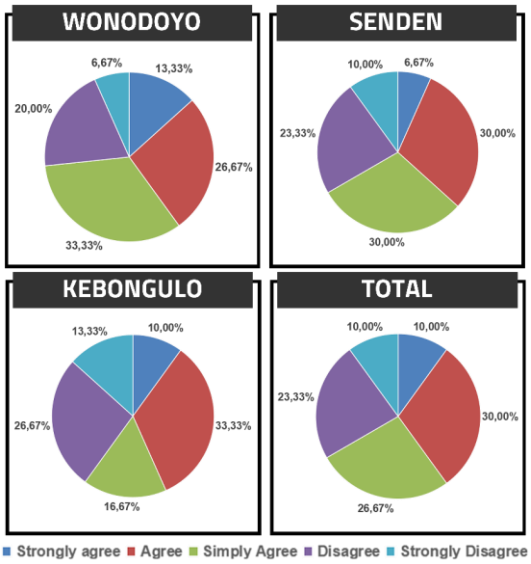

Figure 7. Farmers' perceptions of the role of extension workers in increasing farm income

To change the perception of respondents who disagree (33.33 percent) with the role of agricultural extension workers in strategic programs related to increasing income, agricultural extension workers need to take several action steps. First, they must actively improve communication and interaction with farmers to understand their needs and challenges in increasing income. This action can be done through regular meetings, field trips, or discussion groups. Furthermore, extension workers must provide comprehensive, evidence-based information on revenue-raising strategies and opportunities, such as business diversification, the application of appropriate technology, or broader market access. In addition, extension workers also need to provide assistance and practical training to farmers to help them implement these measures. During this process, agricultural extension workers must pay attention to business sustainability and provide long-term support to farmers.

Perception of the Role of Extension Workers in Improving Farmer Welfare (X8)

Based on Figure 8, it can be seen that most respondents have a positive perception of the role of agricultural extension workers in helping improve the welfare of farmers, with the percentage who agree or agree with enough reaching 66.67 percent. However, around 33.33 percent of respondents showed negative perceptions by disagreeing or strongly disagreeing with the role of extension workers

in the strategy to improve farmers' welfare. Agricultural extension workers must take specific measures to reduce the negative perception of farmers who disagree and strongly disagree. First, they must improve communication and interaction with farmers to understand their perspectives and needs more deeply. Furthermore, extension workers must convey concrete benefits, such as increased income, access to resources, and improved quality of life, that can be achieved through the strategy. In addition, extension workers must also provide concrete examples and evidence of the strategic program's success in improving farmers' welfare. With a communicative approach, providing clear information and concrete evidence, it is hoped that negative perceptions of farmers who disagree and strongly disagree can be reduced, and their understanding of the role of extension workers in strategies that improve farmers' welfare can be improved.

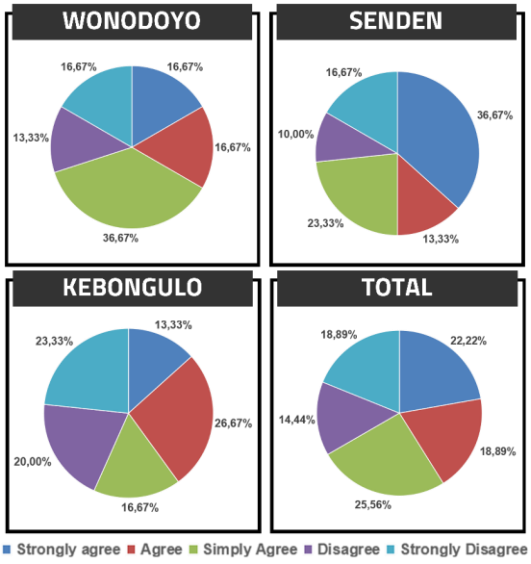

Figure 8. Farmer perceptions of the role of extension workers in improving farmers' welfare

Agricultural extension workers need to take several actions to help improve the welfare of farmers through economic and social approaches in the strategy. Economically, extension workers can provide training and assistance in financial management, business diversification, and product marketing. They should also encourage collaboration between farmers, farmer groups, and financial institutions to access capital. Socially, extension workers must build awareness about the importance of cooperation, togetherness, and added value in strategic programs. They should involve farmers in social activities, such as exchanging knowledge and experience and forming networks between farmers. With a comprehensive approach, agricultural extension workers can support the welfare of farmers through strategies that focus on economic and social aspects.

Perception of the Role of Extension Workers in Increasing Farmers' Environmental Awareness (X9)

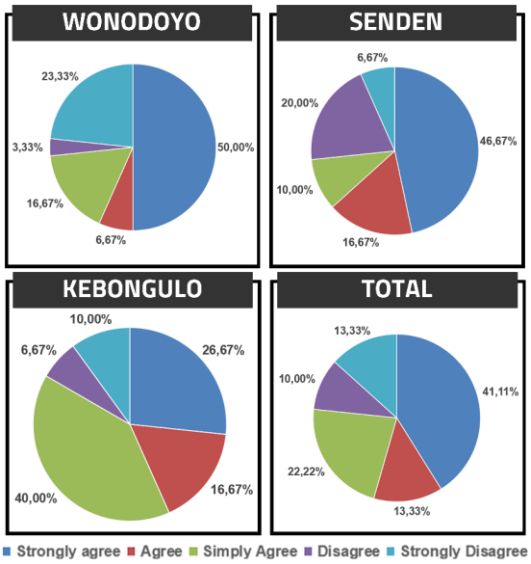

Figure 9. Farmer perceptions of the role of extension workers in increasing farmers' environmental awareness

Based on Figure 9, it can be seen that most respondents (41.11%) strongly agree that the role of agricultural extension workers helps increase farmers' environmental awareness. A lower percentage agree and agree moderately, indicating there is room for increased environmental awareness. Extension workers' role in the strategy must focus on education and training on sustainable agricultural practices, waste management, and efficient use of natural resources. Extension workers must communicate effectively with farmers, explain these practices' benefits and positive impacts, and provide concrete examples through field demonstrations. In addition, extension workers need to identify and address barriers that make farmers disagree or strongly disagree, such as limited knowledge or non-compliance with local conditions. With sustainable efforts, agricultural extension workers can reduce negative perceptions of farmers who disagree and strongly disagree and encourage better environmental awareness among farmers.

Agricultural extension workers need to take several actions to help increase farmers' environmental awareness through a strategic approach involving economic, social, and environmental aspects. First, they can provide information and training on sustainable agricultural practices with long-term economic benefits, such as using organic fertilizers or efficient water management. In addition, extension workers can encourage collaboration between farmers through groups or cooperatives to share knowledge and resources and improve their access to environmentally conscious markets. Furthermore, extension workers can hold socialization activities and campaigns to increase environmental awareness among farmers, such as creating living gardens or preventing environmental pollution. With this holistic approach, agricultural extension workers can play an active role in helping farmers raise environmental awareness and implement sustainable practices in their farming.

CONCLUSION AND SUGGESTION

This study provides an overview of farmers' perceptions of the role of agricultural extension workers in strategic programs, focusing on several aspects such as access to capital, access to resources, increased productivity, farm efficiency, increased income, farmer welfare, and environmental awareness. The results showed variations in farmers' perceptions of the role of extension workers, with most respondents approving of extension workers' contributions in these aspects. However, some farmers negatively perceive the role of extension workers. To overcome the negative perception of farmers towards the role of agricultural extension workers in the strategic program, innovations and strategies are needed to increase the effectiveness of extension services. First, agricultural extension workers must adopt a more open and inclusive approach to communication. They must actively listen to farmers' problems and needs and involve them in the decision-making process regarding the strategy program.

Furthermore, extension workers should improve their skills in providing relevant information and training that farmers can apply directly. They must combine economic, social, and environmental approaches by providing knowledge about sustainable and environmentally friendly agricultural practices. In addition, information and communication technology (ICT) innovations can also be utilized to improve farmers' access to market information, resources, and agricultural innovation. Extension workers must maintain ties with banks, microfinance institutions, and government organizations to increase farmers' capital and resource access. In addition, efforts to increase environmental awareness must be strengthened through education and training campaigns focusing on sustainable agricultural practices. By adopting these innovations and strategies, agricultural extension workers can reduce negative perceptions of farmers and strengthen their role in improving farmers' welfare through strategic programs. Policy recommendations that can be taken are to improve communication and understanding between agricultural extension workers and farmers, as well as improve participatory approaches in strategic programs. Agricultural extension workers need to strengthen their knowledge and skills in providing assistance and assistance to farmers, especially in economic, social, and environmental aspects. In addition, further research can involve a more in-depth analysis of the factors that influence farmers' perceptions of agricultural extension workers and expand the scope of research to different regions or contexts.

CONTRIBUTION STATEMENT

In this article, Norbertus Citra Irawan acts as the main contributor and correspondence contributor.

REFERENCES

Amirrudin, M., Nasution, K., & Supahar, S. (2021). Effect of variability on Cronbach alpha reliability in research practice. *Jurnal Matematika, Statistika dan Komputasi*, *17*(2), 223-230.

Antwi-Agyei, P., & Stringer, L. C. (2021). Improving the effectiveness of

agricultural extension services in supporting farmers to adapt to climate change: Insights from northeastern Ghana. *Climate Risk Management*, *32*, 100304.

Anugrah, I. S., & Wahyuni, S. (2023). Appropriate Technology Interventions For The Successful Of Kostratani Program: Agriculture Extension Officers' Predictions. *Jurnal Ekonomi Pertanian dan Agribisnis*, *7*(2), 967-977.

Aryawiguna, M. I., Djufri, F. A. R. H. A. N., & Syaifuddin, A. K. (2021). An Extension of Competence and Technology in Supporting the Effectiveness of Kostra Tani's Program on Agricultural Products. *Int J Innov Sci Res Technol*, *6*(4), 34-38.

Flake, J. K., & Fried, E. I. (2020). Measurement schmeasurement: Questionable measurement practices and how to avoid them. *Advances in Methods and Practices in Psychological Science*, *3*(4), 456-465.

Kaur, A., Grover, P. S., & Dixit, A. (2020). A Framework for Evaluating Extensibility in an Aspect-oriented Software System and its Validation. *Recent Patents on Engineering*, *14*(4), 557-566.

Maulu, S., Hasimuna, O. J., Mutale, B., Mphande, J., & Siankwilimba, E. (2021). Enhancing the role of rural agricultural extension programs in poverty alleviation: A review. *Cogent Food & Agriculture*, *7*(1), 1-13.

Raj, S., & Garlapati, S. (2020). Extension and advisory services for climate-smart agriculture. *Global climate change: Resilient and smart agriculture*, 273-299.

Safitri, A., Listiana, I., Yanfika, H., Silviyanti, S., & Rangga, K. K. (2023). The Relationship between the Facilities and Infrastructure of the Balai Penyuluh Pertanian (BPP) KOSTRATANI and Its Function as a Data and Information Center at BPP Sidomulyo and Candipuro in South Lampung Regency. *Agriecobis: Journal of Agricultural Socioeconomics and Business*, *6*(01), 1-12.

Saidi, S. S., & Siew, N. M. (2019). Investigating the Validity and Reliability of Survey Attitude towards Statistics Instrument among Rural Secondary School Students. *International journal of educational methodology*, *5*(4), 651-661.

Salman, D., Yassi, A., & Demmallino, E. B. (2023). Knowledge flow analysis of knowledge co-production-based climate change adaptation for lowland rice farmers in Bulukumba Regency, Indonesia. *Regional Sustainability*, *4*(2), 194-202.

Savelli, A., Atieno, M., Giles, J., Santos, J., Leyte, J., Nguyen, N. V. B., ... & Grosjean, G. (2021). Climate-Smart Agriculture in Indonesia. CSA Country Profiles for Asia Series.

Siebrecht, N. (2020). Sustainable agriculture and its implementation gap—Overcoming obstacles to implementation. *Sustainability*, *12*(9), 1-27.

Streimikis, J., & Baležentis, T. (2020). Agricultural sustainability assessment framework integrating sustainable development goals and interlinked priorities of environmental, climate and agriculture policies. *Sustainable Development*, *28*(6), 1702-1712.

Sudaryanto, T., Wahida, H. J., Rafani, I., & Andoko, E. (2022). Promoting Smart Farming based-Digital Business Technology in the Context of Agricultural Transformation in Indonesia. *FFTC Journal of Agricultural Policy*.

Sulaiman, A. A., Sulaeman, Y., & Minasny, B. (2019). A framework for the development of wetland for agricultural use in Indonesia. *Resources*, *8*(1), 1-16.

Sürücü, L., & Maslakci, A. (2020). Validity and reliability in quantitative research. *Business & Management Studies: An International Journal*, *8*(3), 2694-2726.