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DEVELOPMENT STRATEGY TO IMPROVE SUSTAIABLE AGRICULTURAL EXTENSION PERFORMANCE (CASE STUDY: CIREBON, BOGOR, AND OGAN ILIR REGENCIES)

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Abstract

The main objective of agricultural extension expected after the decentralization policy has not been fully realized. This is evidenced by the relatively low performance of the national agricultural extension system. Therefore, this study aims to analyze policy development strategies in order to improve sustainable agricultural extension performance. This research was carried out using a case study approach in several districts, including Cirebon, Bogor, and Ogan Ilir districts. Primary data were obtained from interviews and questionnaires which were distributed to agricultural extension experts consisting of policy makers, academics, practitioners, researchers and agricultural extension workers. The technique of determining the expert is carried out by using the purposive sampling method, the analysis technique is Analytical Network Process (ANP) to formulate the best agricultural extension performance development strategy model. The three research locations experienced the same trend, including: 1) a decrease in the number of agricultural extension workers with ASN and THL status; 2) Farmer institutions are increasing; and 3) The target of agricultural extension (farmers and breeders) is increasing. The results of the research show that the development of extension human resources, training and schools, suitability for work and the level of utilization of IT facilities is a priority in improving the performance of the agricultural extension system. Based on these results, it is suggested that the Variation of Training, the Level of Utilization of IT Facilities in the Implementation of Tasks, Education, Number of Training and Training Hours are expected to be increased in order to encourage increased agricultural extension performance.

Keywords: Analytical Network Process (ANP), performance, agricultural extension

1. INTRODUCTION

Agricultural development is expected to provide a greater contribution to the increase in national economic growth. The importance of the role and contribution of the agricultural sector needs to be considered thoroughly both in terms of human resources and technology. Along with global changes and strategic environmental issues, agricultural extension services are also experiencing changes. One of the strategic components in agricultural development is agricultural extension. These changes in the strategic environment have driven the agricultural extension system to transform. The transformation of the agricultural extension system is reflected in changes in organizational aspects, assignment systems, and human resources.

One of the central issues in the agricultural extension system is decentralization. Decentralization encourages the delegation of agricultural extension authority to the regions. Bariun (2021) states that the goals of decentralization are expected to produce at least

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achievements including: 1) increasing people's welfare; 2) improving public services, and 3) increasing regional competitiveness. Decentralization is seen as important because it opens up wider opportunities for participation by the public and stakeholders in formulating government policies.

However, the expected goals of agricultural extension after decentralization have not been fully realized. This condition is reflected in several factors, including: 1) the number of agricultural extension workers is decreasing. In 2021 there will be a total of 39,817 extension workers or 47.69% of the total 83,647 villages/kelurahan. This number continues to fall from 2015 (47,325); 2) the number of farmer groups as targets for agricultural extension is increasing. In 2021, the number of farmer groups will reach 699,000 units; and 3) the declining role of agricultural extension institutions. This is reflected in the elimination of several institutions such as Bakorluh, BP4K, and BP3K etc.

Competency factor (quality) is something that needs to be improved immediately in order to realize high performance agricultural extension workers. Sapar et al (2012) competency determines performance, in addition to motivation and independence. Competence is an integral part of the performance of agricultural extension workers (Chandhana et al. 2022).

In general, the performance of agricultural extension workers related to the aspects of preparation, implementation, evaluation and reporting is a systematic series. Sapar et al. (2012) added that in order for extension activities to keep abreast of the times and the dynamics of farmers' lives, an extension worker is required to continue the learning process, especially in the aspects of guidelines and instructions for implementing agricultural extension and methods or working systems of agricultural extension. In addition, an agricultural extension worker must continuously add input in the form of knowledge of the latest extension sciences through training or seminars, papers or scientific papers and books that can increase the capacity of agricultural extension agents.

In fact, the agricultural extension competency improvement program is not yet fully available. Preliminary research shows that as many as 63.33% of agricultural extension workers did not get the opportunity to continue their education and get promotions. In terms of human resource development provided by the government, the majority of 70% of extension workers did not receive adequate training and 68.33% of extension workers did not receive the number of hours allocated to attend training. Extension officers (58.33%) stated that they did not get the required variety of training fields. These various factors provide evidence that the development of agricultural extension agents has not been realized properly, where training opportunities and schools can be a motivation for extension agents to improve their performance. Arifianto et al (2017) stated that motivation has a positive and significant effect on the performance of agricultural extension workers. Wibowo & Haryanto (2020) state that the factors that affect the performance of extension agents include the characteristics of extension agents, one of which is the amount of training in agriculture that they participate in. Okwoche et. al. (2015) stated that training had a significant and positive effect on the performance of agricultural extension workers. What's more, the job satisfaction of agricultural extension workers has decreased, which is reflected in the level of remuneration salaries which has relatively not increased

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(Hasanuddin et al, 2019).

These various problems caused the performance of agricultural extension workers to decline. This condition is evidenced by the decline in harvested area and productivity of food crop commodities. In addition, there is a decline in the quality of agricultural extension workers as reflected in their performance, motivation and competence. If this condition is not immediately addressed then agricultural development will be disrupted. Therefore, this study aims to analyze policy development strategies in order to improve sustainable agricultural extension performance.

2. RESEARCH METHOD

This study was conducted in several regencies including Cirebon, Bogor, and Ogan Ilir Regencies. The selection of research locations was based on the consideration that the three locations had access to information technology and infrastructure that would enable agricultural extension workers to optimize their performance.

This study used primary data obtained from interviews and questionnaires distributed to agricultural extension experts consisting of policy makers, academics, practitioners, researchers and agricultural extension workers. The technique for determining experts was carried out using a purposive sampling method, namely by deliberately selecting experts who were competent and directly involved with the agricultural extension system both in the 3 regencies and at the national level.

This study used Analytical Network Process (ANP) method to formulate the best agricultural extension performance policy strategy model. This method is assumed to be able to represent the level of interest of various parties by considering the interrelationships between existing criteria and sub-criteria. The ANP method is able to improve the weaknesses of the previous method, namely the Analytical Hierarchy Process (AHP), namely the ability to accommodate interrelationships between criteria or alternatives (Saaty, 2008). The ANP technique is a generalization of AHP which allows for inner dependence (relatedness within a set of elements), outer dependence (linkages between different elements) and feedback between decision elements in a hierarchical or non-hierarchical structure (Görener, 2012).There are two types of linkages in the ANP method, namely linkages within a set of elements (inner dependence) and linkages between different elements (outer dependence). The existence of this linkage causes the ANP method to be more complex than the AHP method (Susanto, 2017).

The construction of the model in this study was prepared based on the model variables obtained in previous studies related to the performance of agricultural extension using Structural Equation Modellin (SEM). The determination of these variables is a variable that has a significant influence both directly and indirectly which will be grouped into several alternative policies through the ANP procedure. The assessment was carried out by comparing the level of importance between variables by forming a pairwise comparison matrix and a weighting matrix of the agricultural extension performance variables. The results of the ANP analysis of the selected policy alternatives are then described and discussed in a qualitative and in-depth

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manner.

The ANP model framework that was prepared previously was discussed with experts related to policy making and then an assessment of the criteria and sub-criteria was carried out (Vanany 2003; Wang & Hsu, 2003). The assessment matrix between existing criteria must have a consistency ratio below 0.1 or 10 percent. If the consistency value is more than 10 percent, the assessment is considered inconsistent and it is necessary to evaluate the assessment given. The results of the ANP analysis were carried out using Superdecision software tools/applications.

Some of the criteria used to describe performance include: 1) work motivation; 2) HR Development; 3) Job satisfaction; and 4) Information technology. The preparation of each criterion and sub-criteria and their relationship is built into a decision-making model for alternative strategies associated with the objective of improving the performance of extension workers the complete dimensions of each variable are presented in Table 1.

Table 1: Criteria and sub criteria in the ANP hierarchical structure

Criteria	Sub Criteria
Work motivation	Self-development
	Training and school
	Recognition of colleggues and leaders
HR Development	Number of training
	Training hours
	Training variation
	Education
	Promotion
Job Satisfaction	Work as extension workers
	Career achievement
	Achievement of salary and remuneration
	Personal compatibility with work
Information Technology	Availibility of private IT infrastructure
	Personal IT work facility support
	Collective IT work facility support
	Level of utilization of IT facilities in the implementasion of tasks

The assessment of the degree of importance of the paired matrices between criteria and sub-criteria in selecting alternative strategies for improving the performance of extension workerss produces three super matrices consisting of the Unweighted Supermatrix, the Weighted Supermatrix, and the Limiting Supermatrix. All criteria assessments are declared consistent and the eigenvector values of each criterion and sub-criteria can be used to calculate the best priority weight of the model.

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The hierarchical structure of ANP is presented in Figure 1.

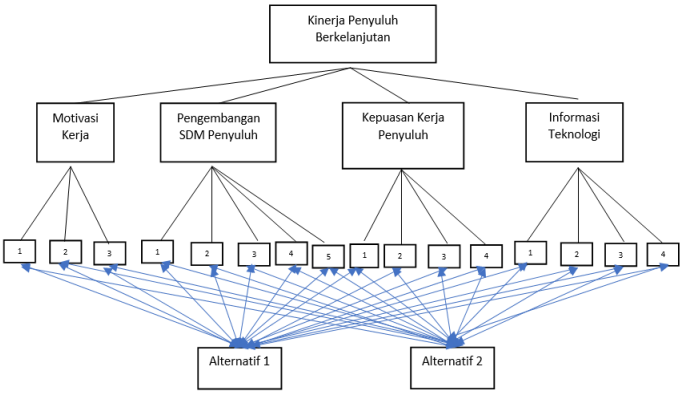

Fig.1 Hierarchical structure in ANP

Hierarchical structure analysis in ANP can be explained based on 4 levels, including:

a. Level 1: Goal / Focus is what is the core focus of the problem that ANP wants to solve. In this research, the research focus is to analyze the performance of sustainable agricultural extension workers with the variables of work motivation, development of human resources for extension workers, job satisfaction of extension workers and information technology;

b. Level 2: Criteria are things that become criteria for goals, including work motivation, human resource development for extension workers, job satisfaction for extension workers and information technology;

c. Level 3: Sub criteria are part of the criteria described in Table 1.

d. Level 4: Alternative strategies are several strategies resulting from the first research stage, namely IT-based agricultural extension and non-IT-based agricultural extension.

3. RESULTS AND DISCUSSION

3.1. Performance of Agricultural Extension in Cirebon Regency

Cirebon Regency is located in the east of West Java Province and is directly adjacent to Central Java Province. The position of the Cirebon Regency area extends from the Northwest to the Southeast. Based on the topography, Cirebon Regency can be divided into two parts; the first is the lowland area with an altitude between 0 – 10 m above sea level (meters above sea level).

In terms of the implementation of agricultural extension in Cirebon Regency supported by:

a. Kelembagaan penyuluhan di tingkat Kabupaten yang dilaksanakan oleh Dinas Pertanian Kabupaten Cirebon melalui bidang penyuluhan pertanian;

b. Extension institutions at the district level implemented by Agriculture Office through agricultural extension division

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c. There are 16 Agricultural Extension Centers (BPP) at the sub-district level. Every two weeks, BPP organizes training for extension workers in accordance with a predetermined program and training schedule.

d. There are 12 Independent Agricultural and Rural Training Centers (P4S).

e. The agricultural extension institution at the village level is the Village Extension Post (Posluhdes), where the institution is the basis for agricultural extension activities at the village level with a total of 336 posluhdes units in 424 villages.

f. There are more than 11,000 farmers and 28,887 farm workers as targets for agricultural extension. In addition, there are more than 4000 farmer institutional units in the form of farmer groups, which are illustrated in Table 2.

Table 2: Performance of farmer institutions in Table 1.

Types of Farmer Institutions	Unit
Food crops Farmer Group (FG)	1.827
State corps FG	191
Horticulture FG	190
Livestock FG	840
Gapoktan	424
Women FG	454
Tarunatani FG	52
Agricultural product processing FG	35
Farmer Association	4
Total	4.017

a. The number of agricultural extension agents consisted of 77 civil servant extension workers, 93 PPPK employees, 46 provincial THL APND and 173 independent agricultural extension workers.

3.2. Performance of Agricultural Extension in Bogor Regency

Bogor Regency is located in West Java Province with the central capital being Cibinong. Bogor Regency has the largest number of villages in West Java Province (435 villages). Production of agricultural commodities in Bogor Regency is dominated by food crops such as rice. The production of corn and soybean commodities is still small and limited to several districts. Rice is the main commodity for food crops. The standard area of paddy fields in Bogor Regency in 2020 is 46,074 ha consisting of irrigated and rainfed rice fields. The average annual growth of paddy fields in Bogor Regency over the last three years has been -0.76%.

Based on these data, the average growth rate of lowland rice production and productivity over the last three years has decreased. The decline occurred, apart from being caused by a decrease in paddy rice planting area, it could also be caused by attacks by Plant Pest Organisms (OPT) or natural disasters such as drought and floods. This condition is inversely proportional to the field rice crop which has experienced an annual increase over the past three years. Based on

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In terms of the implementation of agricultural extension in Bogor Regency is supported by:

a. Extension affairs are carried out by the Agricultural Extension Division led by the Head of Agricultural Extension Assisted by Section Heads and Agricultural Extension Functional Groups
b. Institutions at the sub-district level are in the form of Agricultural Extension Centers (BPP) led by BPP coordinators. BPP in Bogor Regency is divided into 12 regions which have a minimum target area of two sub-districts.
c. There are 48 Posluhdes units.
d. There are 2,150 farmer groups; 303 gapoktan; and 32 units of farmer economic institutions.
e. The number of agricultural extension workers consisted of 58 PNS extension workers, 23 PPPK personnel, 44 provincial budget THL and 200 independent agricultural extension workers.
f. The number of farmers as the target of agricultural extension was 102,444 people.

3.3. Performance of Agricultural Extension in Ogan Ilir Regency

Ogan Ilir Regency is a district in South Sumatra Province. Ogan Ilir Regency has an area of 2,666.07 km2. Administratively, Ogan Ilir Regency has 16 sub-districts, 227 villages and 14 sub-districts, with an area of 2,666.07 km2.

In terms of the implementation of agricultural extension in Bogor Regency is supported by:

a. Agricultural extension institutions at the regency level are carried out by the Department of Agriculture and Food Security through the Agricultural Extension Division
b. Agricultural extension institutions at the sub-district level are carried out by Agricultural Extension Centers (BPP) spread across 16 sub-districts in each sub-district
c. The number of agricultural extension workerss consisted of 61 PNS extension workers, 29 PPPK workers, 124 THL APBD II, 1 THL TBPP and 84 independent agricultural extension workers.
d. There are farmer organizations consisting of 2,163 farmer groups, 162 women farmer groups and 219 gapoktan.

3.4. Agricultural Extension Performance Development Strategy with ANP

3.4.1. Agricultural Extension Performance Improvement Strategy Priorities

The weight rating on the strategy criteria for improving the performance of agricultural

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extension workers is based on the weight value using normalized by cluster. the output of the ANP analysis is shown in Table 4.20. The criteria for developing agricultural extension human resources occupy the first priority in improving the performance of extension workers with a weight value of 0.59. The next priority successively on the alternative criteria for improving the performance of extension workers is work motivation (0.24), Information Technology (0.11) and job satisfaction (0.05).

Improving the performance of extension workers focuses on optimal human resource development efforts, these criteria are a top priority for decision makers if they want to improve the performance of extension workers. In general, the priority criteria analyzed in the ANP are in line with findings in the field which state that all variables (not only human resource development) have a positive and significant impact on the performance of agricultural extension workers.

Table 3: The priority of sustainable extension worker performance perspective

Perspective	Criteria	Value Weight	Ranking
Performance of sustainable agricultural extension	Work motivation	0.23827	2
	Human resources development	0.59398	1
	Job satisfaction	0.04876	4
	Information technology	0.11899	3

The research findings that HR development criteria occupy the first priority in improving the performance of extension workers, are in line with the results of research by Timpe (2000) & Steers (1985) where performance is related to factors of acceptance of the role and factors of HR behavior in them. Referring to Robbins (2008), the performance of an organization is essentially an optimal achievement in accordance with the potential possessed by employees. Organizational performance is the accumulation of the extent of one's activities in carrying out tasks and trying to achieve the goals set. The aspect of human resource development is in line with indicators for measuring individual employee performance according to Robbins (2008), namely in the form of work quality, quantity, timeliness, effectiveness, and independence.

The performance of agricultural extension agents in one area is a description that is mainly composed by the performance of each agricultural extension agent within it. The performance of agricultural extension workers has been regulated in the Regulation of the Minister of Agriculture Number 35 of 2020 concerning Agricultural Extension Functional Positions. Various studies have reported the factors that determine the performance of extension agents in one area. The influence factor is divided into two parts, namely from the internal side and from the external side in the form of the work environment and Schuler and Jackson (1999). This is in line with the results of research by Timpe (2000), Marliati et.al. (2008). Timpe (2000) states that things that affect performance include internal (personal) and external (environmental) factors that describe good or bad performance. Marliati et.al. (2008) revealed that the performance of agricultural extension agents was influenced by internal and external factors. According to Schuler and Jackson (1998), environmental forces, in the form of new technologies, such as computer telematics technology, will have an impact on organizational change and are related to salary and employee performance. Tiraieyari et al. (2010) in Malaysia

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that evaluation competence, cultural competence, social competence and SALM program competence (Skim Amalan Ladang Baik Malaysia) contribute to the work performance of extension workers.

With regard to theoretical, Colquitt et al. (2011) describes the elements of performance categories, that job performance has 3 main categories namely (1) task performance, (2) citizenship behavior, and (3). Counterproductive behavior (counterproductive behavior). In an organizational context, the ability to perform is related to an individual's ability to carry out tasks in accordance with expertise, knowledge and experience, as well as the availability of equipment and technology. Opportunity to do is related to the opportunity and time to do something. While the desire to do is related to. The desire and willingness from within each individual to work to complete the job. According to Ivancevich et al. (2008) performance is "the desired results of behavior". Performance is the expected result of behavior.

3.4.2. Priority Perspective Criteria for Work Motivation

Sub-criteria can be interpreted as detailed problems of problems that are generally referred to as criteria in ANP analysis. Formulation of policies related to the strategy for improving the performance of extension workers must be able to target which detailed aspects must be improved and used as levers so that the policies developed can be formulated appropriately and in accordance with needs. Solving problems can improve the performance of extension agents in an aggregate manner. Based on this description, it is necessary and relevant to know the priority of the sub-criteria for each criterion assessed by experts so that strategies related to the work motivation criteria of extension workers can be targeted precisely in policy formulation.

The results of the assessment and weighting of the sub-criteria from the perspective of the work motivation criteria of the extension workers are presented in Table 4.. Training and schools are sub-criteria or issues that need to be prioritized if improving the performance of agricultural extension workers is seen as important from the perspective of the extension workers's work motivation. The weight value of the training and school sub criteria is 0.63. The sub-criteria from the perspective of work motivation criteria other than training and school and successively become a priority that policy makers need to pay attention to is self-development (0.21) and followed by recognition from colleagues and superiors (0.15).

Table 4: Priority perspective of sustainable agc extension worker motivation

Perspective	Criteria	Weight value	Ranking
Work motivation	Self-development	0.21194	2
	Training and school	0.63195	1
	Recognition of colleguaes and leaders	0.15612	3

The results of the previous analysis show that motivation is directly related to job satisfaction which is a finding that is in line with the theory and many other studies. Research Okwoche et. al. (2015) also found that work motivation has a significant and positive effect on the performance of agricultural extension workers. Motivational factors affect employee performance both descriptively and verifiatively, and the effect of motivation on employee

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performance is quite good (Kuswati 2020). Likewise, Hamali (2013) and Laksmiari (2019), that motivation has a significant effect on organizational output. So, in the future, the aspects of achievement and hard work should be emphasized as benchmarks for promotion. This is added by Andriani & widiawati (2017) employee's intrinsic enthusiasm for and encouragement to complete the job. Motivating employees about work is a combination of meeting the needs and expectations of employees from work and workplace factors that enable employee motivation or not.

Theoretically, motivation is an activity that causes, distributes, and maintains human behavior. This motivation is an important subject for managers, because by definition managers must be with and through other people (Jufrizen, 2018.). Rivai (2011) argues that basically motivation can spur employees to work hard so they can achieve their goals, thereby increasing employee performance so that it affects the achievement of company goals. This means that any increase in employee motivation will provide a very significant increase in improving employee performance in carrying out their work.

Omollo (2015) states that motivation is the key to a successful organization maintaining continuity of work in a strong way and helping the organization to survive. So that motivation is the main factor that affects the human resources of the organization. Motivation will lead to the fact that workers or employees of the organization will seriously carry out their duties and responsibilities (Azar & Shafighi, 2013). Okwoche et al. (2015), most agricultural extension workers have a moderate level of job satisfaction and the probability of agricultural extension work satisfaction increases with an increase in salary and welfare. Training, staff promotion, work motivation, job security and farmer satisfaction have a significant and positive effect on the performance of agricultural extension workers. This is also in line that the need for training exists in various fields of the agricultural sector (Saleh, 2016). Msuya (2017) suggest that agricultural extension workers need training in development and communication to help cope with the increasing sophistication of technology program development. Al-Zahrani (2017), how necessary there is a need for extensive training programs that enable extension agents to work efficiently and effectively in changing agricultural scenarios.

3.4.3. Priority Perspective Criteria for Development of Extension Human Resources

The results of the assessment and weighting of the sub criteria from the perspective of extension human resource development are presented in Table 5. Variation of training is a sub-criteria or problem that needs to be prioritized if improving the performance of agricultural extension workers is seen as important from the perspective of human resource development for extension workers. The weight value of the training variation sub-criteria is 0.36. Sub-criteria from the perspective of other extension human resource development criteria and successively a priority that policy makers need to pay attention to are education (0.31), amount of training (0.16), hours of training (0.11) and promotion (0.05).

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Table 5: Priority perspective on human resource development criteria for extension workers

Perspective	Criteria	Weight value	Ranking
Development of extension human resources	Training hours	0.11290	4
	Number of training	0.16190	3
	Education	0.31233	2
	Promotion	0.05284	5
	Training variations	0.35003	1

There are quite a lot of research results that find the importance of training in human resource development. Training is an approach to managing existing human resources by encouraging and enabling individuals to carry out duties and responsibilities in carrying out work and responsibilities to achieve organizational goals (Nugraha & Juniarti, 2017). Several opinions suggest that employee development is based on five categories: (1) the role of the leader in creating an empowering context; (2) an individual's perspective on an empowered state; (3) collaborative work as development; (4) structural or procedural changes as development; and, (5) a multi-dimensional perspective on development (Jun jo & Joo, 2011).

The results of Septiani (2015) state that employee performance is influenced by both training and work experience. This is in line with research on HR training and development related to organizational performance (Garcia, 2005; Khatri, 2000). The frequency of training is part of education which describes a process in developing individual potential to achieve organizational goals. According to Bahua (2010) training is carried out as an effort to expedite one's learning process, so that one's competence increases through increased knowledge, skills, and attitudes in certain fields to support the implementation of their duties.

Training is a very valuable investment for the future of the organization. Chen and Lin (2003) state that expenditure related to human resources must be viewed as an investment, for example as a training program that aims to add value to future employees.

3.4.4. Priority Perspective Criteria for Job Satisfaction

The results of the assessment and weighting of the sub criteria from the perspective of the extension workers's job satisfaction criteria are presented in Table 6. Suitability for work as extension agents is a sub-criteria or problem that needs to be prioritized if improving the performance of agricultural extension workers is seen as important from the perspective of extension worker satisfaction. The weight value of the self-suitability sub-criteria for the extension workers's work is 0.34. Sub-criteria from the perspective of other extension workers' job satisfaction criteria and successively a priority that policy makers need to pay attention to are the extension worker's career achievements (0.29), the extension workers's salary and remuneration (0.27) and job satisfaction as an extension worker (0.08).

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Table 6: Priority perspective of job satisfaction criteria

Perspective	Criteria	Weight value	Ranking
Job Satisfaction	Work as extension worker	0.08029	4
	Career achievement	0.29619	2
	Achievement of salary and remuneration	0.27754	3
	Personal suitability for work	0.34598	1

Job satisfaction is influenced by psychological factors, social relations, physical and financial. Perceptions of financial factors that are still low, become an obstacle in the performance of agricultural extension workers. Badriyah (2015) states that job satisfaction is the attitude or feelings of employees towards pleasant or unpleasant aspects of work that are in accordance with the assessment of each worker. Wexley and Yukl (2003) argue that job satisfaction is "the way an employee feels about his or her job". Job satisfaction is the way employees feel about themselves or their work. According to Gibson (1997) job satisfaction is a pleasant feeling and is developed by employees all the time regarding aspects of work. The attitude stems from the employee's perception of his job. Job satisfaction stems from various aspects of work such as wages, promotion opportunities, and colleagues.

3.4.5. Priority Perspective Criteria Information Technology

The results of the assessment and weighting of the sub criteria from the perspective of information technology by extension agents are presented in Table 7. The level of utilization of information technology facilities in carrying out their duties as extension agents is a sub-criteria or problem that needs to be prioritized if improving the performance of agricultural extension workers is seen as important from the perspective of information technology in extension services. The weight value of the sub-criteria level of utilization of information technology facilities carrying out tasks by extension agents is 0.58. Sub-criteria from the perspective of information technology criteria in other counseling and successively a priority that policy makers need to pay attention to are support for work facilities related to information technology personally (0.18), availability of private information technology infrastructure (0.14) and support information technology work facilities collectively (0.08).

Table 7: Priority perspective criteria information technology

Perspective	Criteria	Weight value	Ranking
Information Technology	Personal technology availability of personal IT	0.14663	3
	Personal IT work facility support	0.18013	2
	Support of collective IT work facilities	0.08903	4
	The level of utilization of IT facilities in carrying out tasks	0.58420	1

Utilization of information technology (IT) must be supported by the availability of infrastructure, especially in the agricultural extension work environment. The research results of Muzzaki et al., (2016) show that there is a simultaneous influence of each independent

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variable on employee performance. From the results of multiple linear regression, it can be concluded that information technology has a significant influence on employee performance, namely 52.8%. While the remaining 47.2% is another variable that can affect employee performance. Other variables that can affect employee performance include the ability and motivation of employees.

Research in Nigeria (Cynthia and Nwabugwu, 2016) found that the infrastructure, skills capacity and (negative) attitudes of extension workers were a challenge for adopting information and communication related technology tools for extension agents in the local area. The importance of IT is also suggested by Adefila (2012), where the performance of extension workers is unsustainable due to poor infrastructure and uncertain wages. Likewise, Diab and Emam (2021) researched in Egypt concluded that agricultural extension in New Valley requires strengthening of workplace characteristic factors related to the need to increase internalization which represents the goal of empowerment.

3.5. Synthesis of Alternative Performance Improvement Strategies for Sustainable Agricultural Extension

The strategy for improving the performance of sustainable agricultural extension agents as a whole and holistically is structured not only relying on one criterion and sub-criteria. The "bottom up" approach model through PLS and the preparation of alternative strategies using a "top to bottom" approach through ANP lead to policy synthesis from the many alternative policy options. The results of the ANP analysis produce strategic priorities for each criterion shown in Figure 2.

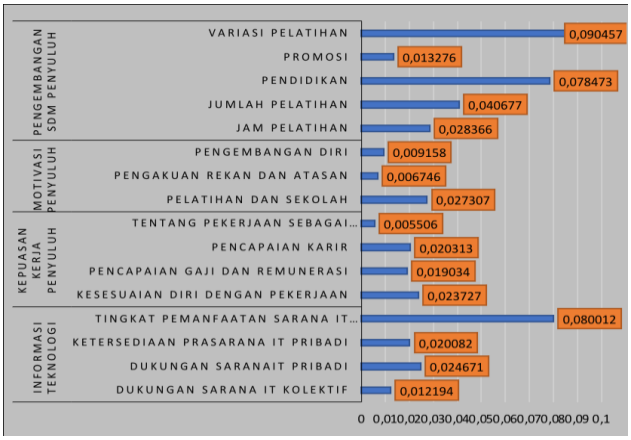

Figure 2: Synthesis of priority ranking criteria and sub-criteria for agricultural extension performance improvement strategies

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Table 8: Ranking subkriteria

Sub Criteria	Weight value	Ranking
Training variations	0.09046	1
The level of utilization of IT facilities in carrying out tasks	0.08001	2
Education	0.07847	3
Number of trainings	0.04068	4
Training hours	0.02837	5
Training and school	0.02731	6
Personal IT work facility support	0.02467	7
Personal suitability for work	0.02373	8
Career achievement	0.02031	9
Personal technology availability of personal IT	0.02008	10
Achievement of salary and remuneration	0.01903	11
Promotion	0.01328	12
Support of collective IT work facilities	0.01219	13
Self-development	0.00916	14
Recognition of colleagues and leaders	0.00675	15
Work as extension worker	0.00551	16

The criteria for developing agricultural extension human resources are a top priority because they have two sub-criteria or fundamental problems in improving the performance of extension agents, namely (1) variations in training, and (2) education. Agricultural extension workers, especially those who have ASN status, are quite complex and take into account the fundamental characteristics of the extension workers themselves, including rank/class, education, achievement assessment, competency test, years of service, training experience, age and fulfillment of functional credit scores which are the basic capital and foundation. Career extension workers. The linkage of these basic characteristics has implications for the development of extension workers when linked to the variables and or criteria for the development of human resources for extension workers in this study. The variables of human resource development and work motivation of extension workers are constructs of job satisfaction variables at the field level, while on the other hand the variables and criteria of human resource development and motivation also have a direct influence on performance and function as criteria that need to get more priority in policy formulation. Information technology is a moderating variable of job satisfaction on the performance of extension agents, in other words the use of information technology both in the form of various supports and programs can also be a leverage on the performance of agricultural extension workers. Sub-criteria the level of utilization of IT facilities, which in this case is a priority, describes performance improvement requiring ideal conditions where extension agents can contribute to agricultural development if they can utilize the support and facilities provided. Meanwhile, the level of utilization of information and technology is largely determined by the quality of human resources in the end. Based on the results of data processing carried out through the Super Decision software, (Table 9). It is obtained that Alternative Policy A with a weight of 0.83580

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is superior to Alternative Policy B of 0.16420. The sub-criteria for Training Variation, Level of Utilization of IT Facilities in the Implementation of Tasks, Education, Number of Training and Training Hours are 5 of the top 10 criteria that are superior to Policy Alternative A.

Table 9: Ranking of policy alternatives

Alternative	Normalized by cluster	Ranking
Policy alternative A	0.93580	1
Policy alternative B	0.16420	2
	1.00000	

3.5. Policy Alternative Implications

Based on the results of the research, it shows several policy implications, including:

a. The first priority is the development of Extension Human Resources. For the Performance of Sustainable Extension Officers, Job Satisfaction has the lowest weighted score while Extension Human Resource Development gets the highest weighted score. For this reason, it is necessary to develop policies that prioritize HR development aspects in the form of developing education and training systems as well as promotion mechanisms with measurable and result-oriented career patterns to be able to improve the performance of agricultural extension workers.

b. For Extension Work Motivation, Recognition of Colleagues and Superiors have the lowest weighted scores while Training and Schools get the highest weighted scores. This means that extension officers must increase their opportunities for training and schools so that they are more motivated to work.

c. For Extension Human Resource Development Variable, promotion has the lowest weighted score while variation gets the highest weighted score. This means that the variety of training still has to be added with various methods that keep up with the times.

d. For the Job Satisfaction, work as an extension agent has the lowest weighted score, while work as an extension worker, while self-congruence with work gets the highest weighted score. That is, in encouraging job satisfaction, extension officers must continue to be fostered to be more creative in modifying work in achieving targets, receiving awards from leaders and other parties.

e. For the Job Satisfaction, work as an extension agent has the lowest weighted score, while work as an extension worker, while self-congruence with work gets the highest weighted score. That is, in encouraging job satisfaction, extension officers must continue to be fostered to be more creative in modifying work in achieving targets, receiving awards from leaders and other parties.

Based on the policy implications, it is suggested that one of the efforts to improve the Performance of Sustainable Agricultural Extension is suggested to the Leaders of Agricultural Extension Agencies, building more diverse training both offline and on line, encouraging the level of utilization of IT facilities in supporting the implementation of extension duties both to

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access information, provide feedback return, and utilize for agricultural extension activities. Apart from that, the efforts made are to provide educational opportunities for extension workers, as well as increasing the number of training and training hours in accordance with the technical and managerial needs of extension workers. In order to improve the performance of agricultural extension workers, in addition to increasing the motivation of agricultural extension workerss, it is also necessary to increase human resource development factors through education, training and promotion. Motivational factors and human resource development that encourage job satisfaction also determine the performance improvement of agricultural extension workers. For this reason, it is necessary to build extension workers motivation and develop human resources in accordance with the needs of agricultural extension workers who can increase job satisfaction both in terms of comfort at work, pride in being an extension worker, career achievement, adequacy of salary and remuneration, and self-match for work. Information technology factors together with job satisfaction can improve the performance of extension workers. For this reason, it is necessary to develop an information system that can be utilized by extension agents in the framework of carrying out agricultural extension activities and to increase the provision of IT working facilities that can be used collectively among agricultural extension agents.

4. CONCLUSIONS

Overall, the researcher expects that the results of this study will provide useful information for stakeholders. It was found that the comparison model of the Priority Perspective of Sustainable Extension Performance, the first priority is the development of Extension Human Resources. In measuring the performance of sustainable extension workerss, job satisfaction has the lowest weighted score, while human resource development extension workers receive the highest weighted score. Details for each variable are:

1. Untuk prioritas Perspektif Variabel Motivasi Kerja Penyuluh, Pengakuan Rekan dan Atasan memiliki skor terbobot terendah yaitu 0,15612, sedangkan Pelatihan dan Sekolah mendapatkan skor terbobot tertinggi yaitu 0,63195;
2. For the priority of the Extension Work Motivation Variable Perspective, Recognition of Colleagues and Superiors has the lowest weighted score, while Training and Schools get the highest weighted score;
3. For the Priority Perspective Variable Development of Extension Human Resources, promotion has the lowest weighted score, while training variations get the highest weighted score;
4. For Priority Perspective of Job Satisfaction Variables, Occupation as an extension worker has the lowest weighted score, while Self-Compatibility with Work gets the highest weighted score;
5. For a comparison of the Priority Perspective of the Information Technology variable, perceptions of Collective IT Work Facility Support have the lowest weighted score, while the Level of Utilization of IT facilities in the Implementation of Tasks gets the highest

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weighted score;

6. Regarding the choice of policy alternatives, Alternative Policy A with the weight of being the first choice with the sub-criteria Variation of Training, Level of Utilization of IT Facilities in the Implementation of Tasks, Education, Number of Training and Training Hours that can encourage agricultural extension performance increases.

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