

Rural Community Empowerment through the Utilization of Straw as Compost

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Abstract There was a prolonged decline in soil quality due to the excessive use of chemical fertilizers and the lack of empowerment of farmers about these hazards. Meanwhile, the potential to restore soil fertility was very open, one of which is rice straw compost. The aim of this study was to analyze the effect of farmer characteristics and government support on the empowerment of rural community through the utilization of straw as compost in lowland rice plants. The research activity was carried out for three months (April - July 2020). This study was a survey research with a quantitative assessment approach supported by qualitative data and information. A total of 80 respondents selected from 256 were determined by the Slovin formula. Data were collected through direct interview using a closed-ended questionnaire, which had been tested for its validity and reliability. Data were analyzed in two ways, namely: with descriptive statistics to explain the performance of the research variables, and linear regression analysis to determine the factors that influence community empowerment. The result of the study showed that the farmer characteristic and government support had a significant effect on the empowerment. Factors that affect the empowerment of farmers were the characteristics of farmers including; age, education, and farming experience; and government supporting factors consisting of; the role of extension workers, the availability of facilities and infrastructure, as well as the availability of information sources. Therefore, a strategy that can be implemented to optimize community empowerment in the utilization of rice straw for compost is

to increase external support to foster farmers either through counseling or other activities.

Keywords Empowerment, Farmers, Compost, Lowland Rice

1. Introduction

As an agricultural nation, agricultural activities have been carried out for a long time, along with technological developments and needs, and intensive agricultural activities are continuously conducted. Along with such agricultural practices, there is a decrease in land or soil quality due to natural processes such as erosion, pollution, and others. Soil contamination will reduce soil quality, such as decreasing soil nutrient content due to erosion. Decreased soil quality can also occur due to excessive and continuous use of manufactured chemical fertilizers for a long time. The impact that will arise from this condition is a decrease in plant productivity on the said land, including in lowland rice cultivation.

In order to prevent the impact caused by decreasing land quality, strategic and systematic efforts to treat the areas experiencing a decrease in land quality are needed. One of the programs offered by the government, in this case, the Ministry of Agriculture to overcome the decreases of land quality is the use of organic fertilizers with raw materials derived from local plant residues. According to

information from local extension workers and documents of Extension Programs from the Cikoneng District Agricultural Extension Center, efforts to promote the use of organic fertilizers have been frequently carried out, and even the practice of producing compost from straw has been carried out. However, farmers, especially lowland rice farmers, still have not used compost as a necessity to compensate for the use of factory chemical fertilizers.

Effendy and Gumelar [1] reported that the use of fertilizers in a balanced manner has not been fully implemented by rice farmers. This means that farmers still rely on the use of factory chemical fertilizers and do not fully understand that the use of factory chemical fertilizers can reduce the quality of paddy fields. This condition is also in line with Effendy and Sudiro [2] that farmers' participation in using fertilizers in a balanced manner in lowland rice is still not satisfactory, meaning that most lowland rice farmers are still reluctant to apply fertilization in a balanced manner to their rice fields. This condition should be stopped or a solution must be sought thus the lowland rice farmers do not rely on factory chemical fertilizers and are encouraged to use organic fertilizer or compost.

Based on the focus of the above problems, the aims of this study were: (a) describe the level of empowerment of lowland rice farmers, (b) analyze the factors that affect the empowerment of farmers in using straw compost, and (c) find strategies to increase the empowerment of rice farmers rice fields through the use of straw compost.

2. Methods

This research applied quantitative research supported by qualitative data and information through direct surveys of the farmers. The research activity was carried out for three months (April - July 2020) in Cimari, Kujang, and Gegempalan Villages, Cikoneng Sub-district, Ciamis Regency, West Java Province, the research location is as shown in Figure 1. Determination of respondents was done by selecting (purposive sampling) due to the limited number of farmers who were willing to take part in the research during the planting season, thus the number of respondent farmers was 76 people representing six farmer groups from three selected villages.

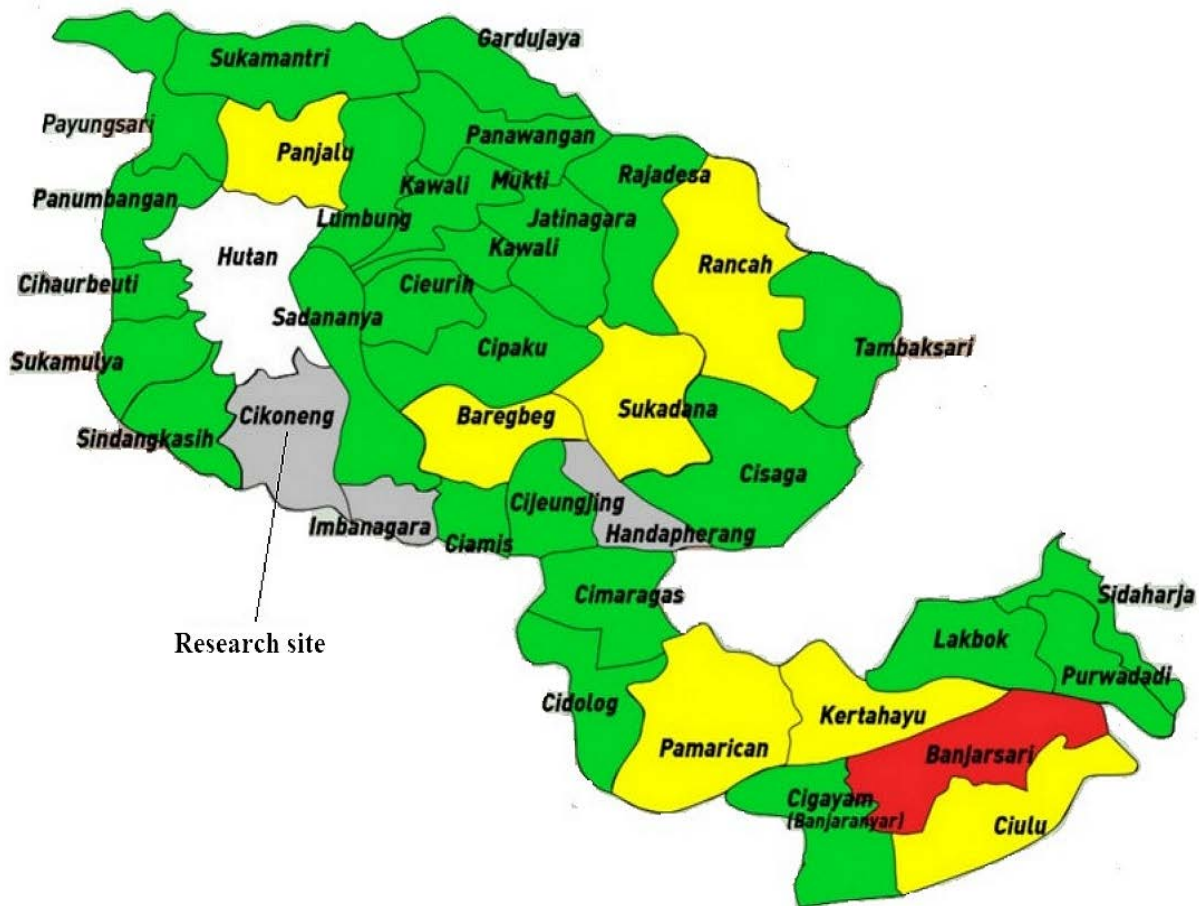


Figure 1. Research location map

The data collected includes primary data obtained directly from respondent farmers through a closed-ended questionnaire that has provided the answer choices. The type of data collected through a questionnaire is in the form of interval data. Before being used to collect questionnaire data, its validity, and reliability were tested. The test results stated that the questionnaire was suitable for use as a means of collecting data with a Cronbach alpha value of 0.823. Apart from primary data, secondary data was also collected in the form of additional information or data derived from reports or other documents from the local village and sub-district offices.

The data were analyzed in two ways, namely descriptive analysis to explain the performance of each research variable and linear regression analysis to analyze the factors that had an effect on the empowerment of rice farmers. The data analysis was assisted by the SPSS program tool version 26.

Based on the description above, a research framework is built based on the hypothesis that there are a number of variables that can affect the empowerment of a person or community group. Effendy et al. [3] explained the youth involvement to increase the youth empowerment. Meanwhile, [2] Effendy and Sudiro argued about factors that affect the woman empowerment in land use are external factors and farmer group supports.

Based on these reviews, the research hypothesis consists of two independent variables, namely farmer characteristics (X_1) and government support (X_2). Farmers' characteristics include: age, level of education, and farming experience; meanwhile, government support includes: the role of extension workers, the availability of facilities and infrastructure, and the availability of information sources.

3. Results

3.1. Description of Respondent Characteristics

The results of the descriptive analysis of the respondent farmers' characteristics which include age, level of education, and farming experience are presented in Table 1.

Table 1 shows that most of the respondent farmers (75%) are between the ages of 16 and 63, which can be categorized as the productive age group. The majority of respondents' education level (76.25%) is elementary school which is classified as low. Meanwhile, most of the respondent farmers (51.25%) had a long experience of more than 20 years.

3.2. Description of Government Support

The results of descriptive analysis of the variable government support consisting of the role of extension workers, the availability of facilities and infrastructure, and

the availability of information sources indicate that generally government support is included in the medium category with an average score of 2.88. A description of government support is presented in Table 2. Table 2 shows that government support obtained a mean score of 2.88, which means that it is classified as sufficient. Although the scores for the support of each indicator are not absolutely different, the highest score is obtained by the role of the instructor (2.91), followed by the availability of information sources (2.90), and the lowest is the infrastructure. These results suggest that the support for infrastructure is considered lower than the role of the extension workers and the availability of information sources.

3.3. Level of Empowerment

Farmers' empowerment is measured from the aspects of knowledge, attitudes, and skills. The results of the descriptive analysis show that the score for the level of empowerment is 2.50 which is included in the sufficiently empowered category. The details of the scores for each of the empowerment indicators are presented in Table 3.

Table 3 shows that the value obtained by the three indicators of empowerment is not much different, but the highest value is obtained by the knowledge aspect (2.60), followed by attitude (2.54), and the skills aspect of 2.47. These results suggest that skills are rated the lowest by farmers compared with other aspects, thus it needs to be improved hence farmer empowerment also increases.

3.4. Factors Influencing Community Empowerment

The results of linear regression analysis showed that the independent variables consisting of farmer characteristics (X_1) and government support (X_2) had a significant effect at the 95 percent confidence interval ($p < 0.005$). Details of the results of the regression analysis are presented in Table 4.

Table 4 shows that the farmers' characteristics have a significant effect on farmer empowerment with a coefficient of 0.237, likewise government support has a significant effect on empowerment with an influence coefficient of 0.641. This analysis also obtained a determinant factor (R^2) of 0.531 and a constant value (a) of 0.101.

These results can be further explained; (1) the determinant factor (R^2) is 0.531 or 53.1 percent, meaning that the farmers' characteristics (X_1) and government support (X_2) contribute 53.1 percent to the level of farmer empowerment, while the remaining 46.9 percent comes from other factors not examined in the study. (2) the constant value is 0.101, it can be explained that if the farmers' characteristics (X_1) and government support (X_2) are zero, then the level of farmer empowerment is 0.101. (3) the coefficient of influence on farmer characteristics is positive 0.237, meaning that if the coefficient value of

government support is zero, then every increase of one unit of farmer characteristics will increase empowerment by 0.237, (4) the coefficient of influence of government support is positive 0.641, meaning that if the coefficient value of farmer characteristics is zero, then every increase

of one government support unit will increase empowerment by 0.641. Thus, these results obtain a regression equation model of $Y = 0.101 + 0.237X_1 + 0.641X_2$.

Table 1. Description of the respondents' characteristics

Group	Group	Total (person)	Percentage (%)
Respondent Age (X_{1.1})			
Not yet productive	0 - 15 years	0	0.00
Productive	16 - 63 years	62	75.00
Not productive/elderly	>64 years	18	25.00
Education Level (X_{1.2})			
Elementary school	0 - 6 years	61	76.25
Junior High School	7 - 12 years	14	17.50
High school	13 - 15 years	5	6.25
Higher education	> 15 years	0	0.00
Experience (X_{1.3})			
Beginner	1 - 10 years	18	22.50
Intermediate	11 - 20 years	21	26.25
Experienced	> 20 years	41	51.25

Table 2. The average score of government support

No	Indicator	Average
1	The Role of the Extension Workers	2.91
2	Facilities and infrastructure	2.81
3	Resources	2.90
Average		2.88

Table 3. The average score of farmer empowerment

No	Indicator	Average
1	Knowledge	2.60
2	Attitude	2.54
3	Skills	2.47
Average		2.50

Table 4. Results of the regression analysis

No	Variable	Coefficient	Sig	Description
1	R ²	0.531	-	-
2	Constant	0.101	0.765	-
3	Farmers Characteristic (X ₁)	0.237	0.000	Significant
4	Government Support (X ₂)	0.641	0.000	Significant

4. Discussion

4.1. Effect of Farmer Characteristics on Community Empowerment

The results of the regression analysis found that the characteristics of respondent farmers (X_1) had a significant effect on empowerment, which means that in increasing farmer empowerment, factors related to the farmer's personality should be a concern before taking steps or deciding on a program. In line with this, the results of the descriptive analysis on the personal characteristics of the respondent farmers show that 75.0 percent of the respondent farmers belong to the productive age group (16 - 63 years) and 76.25 percent have long farming experience (> 20 years); although the majority have low levels of education (Elementary School).

These results indicate that even though the education level is low, having sufficient experience and being motivated by work spirit to keep doing business will be able to encourage the level of empowerment.

This result is in line with [4], [5], [6], who reported that the personal characteristic component is an important indicator in increasing empowerment. In addition, empowerment can also be determined by factors from outside the characteristics, such as a person's involvement in a program or activity [3], also determined by external factors such as; availability of infrastructure, extension activities, farmer group functions, and access to information [7], [8] [9] [10]. Meanwhile, Permana and Effendy [11] explained that the empowerment of women farmer groups is significantly influenced by external factors consisting of; support for group members, the availability of facilities and infrastructure, policy support, and outreach activities.

4.2. Influence of Government Support on Community Empowerment

Based on the results of the regression analysis (Table 4), it is known that government support (X_2) has a significant effect on the empowerment of a person or community group. This means that government support which consists of; the role of extension workers, facilities and infrastructure, and availability of information sources determine the level of farmer empowerment. When compared with the results of the descriptive analysis, these results indicate a relationship, government support is in the sufficient category, meaning that it is not fully in accordance with the expectations of the respondent farmers.

Thus, any efforts to increase farmers' empowerment, should consider determined aspects, namely the role of extension workers, the availability of facilities and infrastructure, and the availability of information sources. The more optimal the extension workers carry out their functions and roles, the better the impact on increasing

farmer empowerment. Likewise, the availability of infrastructure, as well as the availability of information sources, will have a greater influence on increasing farmer empowerment. These results reinforce the findings of [9], [11] which concluded that the availability of infrastructure, extension activities, support and functions of farmer groups, and access to information greatly determines the empowerment of group members. It is also in line with Wijayanti and other research results [12], [13], [14], [15], that government support for a community will have a real effect on the community empowerment.

5. Conclusion

From the descriptions that have been stated above, the conclusions of this study are the characteristics of rice farmers in Cikoneng Subdistrict; age is included in the productive group (16 - 63 years), low level of education (elementary school), and has quite a long farming experience (> 20 years). The factors that influence farmer empowerment are the farmers' characteristics which include; age, education, and farming experience; and government support factors which consist of; the role of the extension workers, the availability of facilities and infrastructure, as well as the availability of information sources. Strategies to increase farmer empowerment in Cikoneng Subdistrict can be implemented by optimizing the support of external factors and paying attention to the characteristics of local farmers.

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