Level of Motivation Among Farmer Group Members in The Utilization of Vermicompost in Klepu Village, Kranggan District, Temanggung Regency

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ABSTRACT
This research was conducted from April 6 to June 4, 2026, in the farmer groups of Klepu Village,Kranggan District, Temanggung Regency. This study aims to determine the effect of various factors on the motivation level of farmer group members in utilizing vermicompost, as well as to determine the Extension Effectiveness (EE) and Behavioral Change Effectiveness (BCE). This study used a sample of 38 farmer group members, utilizing a one-shot study and one-group study design. Data were collected through observation, interviews, and questionnaires, then analyzed descriptively and statistically. Simultaneously, the variables of education level and member activeness had a significant effect on motivation, whereas age, number of family dependents, and farming experience showed no significant effect. The results showed that the Extension Effectiveness (EE) fell into the effective category at 91%, while the Behavioral Change Effectiveness (BCE) was also effective at 78%.
Keywords: Extension Evaluation; Motivation; Vermicompost

INTRODUCTION

The livestock and agricultural sectors are two inseparable pillars in realizing a sustainable agricultural system. The continuous use of inorganic fertilizers has led to a decline in soil quality in Indonesia. In modern agriculture today, reliance on inorganic chemical inputs has triggered global land quality degradation. As a solution, the sustainable agricultural paradigm that prioritizes ecosystem balance has become a necessity.

According to data from the Ministry of Agriculture, approximately 60–70% of paddy fields inIndonesia currently have a soil organic matter content (Organic-C) below 2%, whereas healthy soil ideally has a content above 5%. Soil degradation data resulting from inorganic fertilizers in the Temanggung region, particularly the agricultural and livestock sectors, shows a pattern similar to the national conditions mentioned, where soil Organic-C content tends to be low.Klepu Village in Temanggung has become an exemplary sustainable agriculture initiative through various food agriculture development programs.

Organic fertilizer functions as a soil conditioner that can increase organic matter and humus content, provide macro and micro nutrients, and improve the physical, chemical, and biological properties of the soil. In the study of vermicompost, organic fertilizer serves as the main raw material which is then processed through earthworm activity to form vermicompost that is more mature, more stable, and possesses nutrient content that is more easily absorbed by plants.

Vermicompost is the result of fermentation from a mixture of worm castings and organic material that produces nutrient-rich organic fertilizer. Vermicompost emerges as a leading innovation because it contains richer nutrients and functional microbes resulting from earthworm decomposition. The implementation of this technology is closely related to the livestock sector, where livestock waste often serves as the primary raw material for Lumbricus rubellus earthworms to produce high-quality castings. However, the effectiveness of this technological transition at the field level is determined not only by the availability of raw materials, but also by
the mental readiness of the practitioners.

Farmer groups serve as the primary forum for the dissemination of agricultural innovations. In this organization, the level of technology adoption is heavily influenced by member motivation, both intrinsic (environmental awareness) and extrinsic (economic value). Motivation functions as a driving engine that transforms knowledge into concrete action. Without strong encouragement,the utilization of

vermicompost will only stop at the discourse stage without consistentimplementation.

The Regional Potential Identification (IPW) results in Klepu Village, Kranggan District, Temanggung Regency, particularly in the Ngudi Raharjo Farmer Group, recorded a quite potential livestock population. Although potential raw materials are available, the intensity of vermicompost utilization among members still shows diversity. The gap between existing knowledge and field practices is strongly suspected to stem from differences in individual motivation levels. Therefore, this study aims to examine the motivation level of farmer group members in utilizing vermicompost in Klepu Village.

MATERIALS AND METHODS

Agricultural extension is a continuous learning process for primary actors and business actor so that they possess the capability and independence to access information, technology, andresources to improve their productivity and livelihood welfare. In the context of farming business development, the utilization of livestock waste such as cow manure combined with organic materials and rice husk charcoal through the assistance of earthworms (Lumbricus rubellus) is capable of producing high-quality vermicompost rich in nutrients and safe for the environment.

The success of adopting such technological innovation is heavily influenced by the level of farmer motivation, which according to Uno functions as an internal and external driving force to direct a person's behavior in achieving desired goals. Furthermore, the effectiveness of an extension program can be measured quantitatively through changes in the level of knowledge, attitudes, and skills of the target audience to see the extent to which community empowerment goals are achieved.

Motivation (ERG Theory): According to Argundade & Akpa (2023), the ERG motivation theory (Existence, Relatedness, Growth) is a refinement of Maslow's Hierarchy categorized into three: (1) Existence needs which encompass physiological and material needs, (2) Relatedness needs which encompass interpersonal and social relationships, and (3) Growth needs which encompass personal development and the actualization of one's potential.

This research was conducted in Klepu Village, Kranggan District, Temanggung Regency. The implementation period of the research activities and data collection took place from April 6 to June 5, 2026. Klepu Village is located in Kranggan District, Temanggung Regency, with an area of 345.8 hectares at an altitude of 501 meters above sea level. The regional topography consists of flat areas (30%), undulating areas (60%), and steep valleys (10%). The livestock potential in Klepu Village strongly supports vermicompost development.

Research instruments included structured questionnaires for data collection from respondents, stationery, a camera device for documentation, a laptop for data processing and report preparation, as well as a shovel, buckets, and scales for vermicompost production. The materials used in the vermicompost production process included cow manure, Lumbricus rubellus earthworms, rice husk charcoal, and organic waste. This study used a quantitative approach with field experiment and survey designs. To evaluate extension activities, a One Group Pretest-Posttest Design and One-Shot Case Study design were used.The One Group Pretest-Posttest design was used to measure the level of behavioral change covering aspects of Knowledge, Attitude, and Skill (KAS) before and after being given treatment in the form of extension. A one-sample comparative statistical test (One Sample t-test) was used to test the difference in variable averages against a predetermined constant or specific standard.

The population in this study consisted of all breeder families in Klepu Village, Kranggan District, Temanggung Regency, totaling 533 households. Sampling was conducted using probability sampling techniques with a total of 38 respondents who are farmer group members. Sample criteria included active breeders domiciled in Klepu Village, who had previously participated invermicompost extension, and who raised at least 2 cattle.

Data were analyzed descriptively using tables and continuum lines, as well as inferential statistical analysis consisting of validity tests, reliability tests, classical assumption tests, and multiple linear regression analysis to determine the effect of age (X1), education level (X2),farming experience (X3), member activeness (X4), and number of family dependents (X5) onmotivation (Y). Extension Effectiveness (EE) and Behavioral Change Effectiveness (BCE) werecalculated using the percentage formula of pretest and posttest scores.

No	Characteristic	Classification/Average
1	Age (X1)	Productive (26-45 years)
2	Education level (X2)	Junior-senior high school graduate (SMP-SMA)
3	Livestock farming experience (X3)	Moderate (> 5 years)
4	Member activeness(X4)	Active (Attendance > 75%)
5	Number of family dependents (X5)	3-4 people

Primary data were obtained directly from respondents through field observation, interviews using questionnaires, and pretest-posttest measurements on aspects of knowledge, attitudes, and skills (KAS) as well as the level of motivation. Secondary data were obtained indirectly through literature, village monograph archives, as well as data from the Kranggan District Agricultural Extension Center (BPP) and the Klepu Village Government.

Before being used in the field, the questionnaire instruments were first tested for validity and reliability outside the main sample to ensure data accuracy and consistency:

1. Validity Test: Measured using the Pearson Product Moment correlation technique with the assistance of SPSS statistical software. An item is declared valid if rcount > rtable or significance value < 0.05.
2. Reliability Test: Tested using Cronbach's Alpha technique. Instruments are declared reliable if the Cronbach's Alpha coefficient is greater than 0.60 (> 0.60).

Data analysis was conducted using two main methods:

1. Descriptive Analysis: Used to describe respondent characteristics, motivation levels based on ERG theory (Existence, Relatedness, Growth), and extension evaluation using tables and Likert scale-based continuum lines.
2. Multiple Linear Regression Analysis: Used to test the effect of independent variables (age, education level, farming experience, member activeness, and number of family dependents) on the dependent variable (breeder motivation level). The regressionequation model is formulated as follows:

$$Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \beta5X5 + \varepsilon$$

Prior to regression analysis, Classical Assumption Tests were conducted, which included normality tests, multicollinearity tests, and heteroscedasticity tests. Hypothesis testing was conducted via the Coefficient of Determination Test (R2), Simultaneous Test (F-Test), and Partial Test (t-Test) at a significance level of $\alpha = 0.05$.

RESULTS AND DISCUSSION

The results of the descriptive analysis indicate that the motivation level of farmer group members in utilizing vermicompost in Klepu Village is in the very high category. According to Sugiyono (2016), strong motivation is an internal factor that underlies a person to act optimally in adopting a new innovation. This high motivation is driven by the awareness that vermicompost fertilizer processing with the addition of organic waste and rice husk charcoal can strengthen social relationships among group members while providing promising economic opportunities for the community.

To determine the effect of age, education level, farming experience, member activeness, and number of family dependents on the farmers' motivation level, a multiple linear regression analysis was conducted after passing the tests. The characteristics of respondents based on the analysis of 38 farmer group member respondents are presented in the following table: Model B t Significance Description Based on the multiple linear regression test table above, a coefficient of determination (R2) value of 0.682 was obtained, meaning that 68.2% of the variation in the motivation level offarmer group members is influenced by these five independent variables, while the remaining31.8% is influenced by other factors outside the model.F-Test (Simultaneous): The calculated F-value is 13.84 with a significance level of 0.000 (<0.05),meaning H0 is rejected and H1 is accepted. Simultaneously, age, education level, farming experience, member activeness, and number of family dependents have a significant effect on

the motivation of farmer group members in Klepu Village.

t-Test (Partial): The education level variable (X2) and member activeness variable (X4) partially and significantly affect motivation ($p < 0.05$). The higher the education and member activeness in farmer group activities, the higher the motivation to utilize vermicompost will be. Conversely,age, farming experience, and number of family dependents do not partially have a significant effect.

Extension evaluation was conducted to measure changes in Knowledge, Attitude, and Skill (KAS) aspects before and after extension via pretest and posttest. The analysis results showed a significant increase in all three aspects.

Evaluation Aspect Pretest Score / Average Posttest Score / Average

Evaluation aspect	Score/ Average (pretest)	Postest score /average (postest)
Knowledge	58,5	92,0
Attitude	64,2	89,5
Skills	52,0	88,0

Evaluation Aspect Pretest Score / Average Posttest Score / Average Based on the calculation of the extension program effectiveness formula measured using the approach by Arikunto (2019), it shows an Extension Effectiveness (EE) score of 91% in the very effective category and a Behavioral Change Effectiveness (BCE) score of 78% in the effective category in rapidly improving farmers' knowledge, attitudes, and skills. This high level of effectiveness proves that the extension methods applied match the needs and characteristics of the targets in Klepu Village.

CONCLUSION

Based on the results of the final project research that has been carried out, it can be concluded that age, farming duration, and number of family dependents do not significantly affect themotivation level of farmer group members. On the contrary, education level and member activeness have a very significant effect, where higher education and group activeness increase motivation in processing waste into vermicompost. In addition, the effectiveness of vermicompost processing extension with the addition of organic waste and rice husk charcoal is in the very high category (91%), while the respondents' Behavioral Change Effectiveness (BCE) falls into the effective category (78%). Based on these findings, it is recommended that extension and farmer group mentoring activities continue to be intensified to maintain member activeness and sustainably expand the application of vermicompost technology.

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DOKUMENTASI



Dokumentasi kunjungan ketua kelompok tani



Kunjungan kandang Kelompok Tani