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Literacy and Inclusion Levels of Organic Fertilizer

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Abstrak

Produk pertanian organik bermanfaat tidak hanya bagi kesejahteraan manusia, tetapi juga bagi keberlanjutan lingkungan dalam jangka panjang. Salah satu koperasi penghasil produk pertanian organik di Provinsi Jawa Tengah adalah Asosiasi Petani Organik Boyolali (APOB). APOB memiliki dua masalah, yaitu: kurangnya literasi pupuk organik dan inklusi bagi pengurus dan anggota. Oleh karena itu, penelitian ini berupaya untuk menilai tingkat literasi dan inklusi pupuk organik. Periode penilaian dilakukan pada Juli-Agustus 2025. Data primer dikumpulkan menggunakan diskusi kelompok fokus dan wawancara mendalam yang melibatkan 15 pengurus dan anggota APOB. Metode yang digunakan adalah statistik deskriptif. Hasil penelitian menunjukkan bahwa tingkat literasi pupuk organik adalah 66,29%. Tingkat ini ditentukan oleh pengetahuan (64,71), perilaku (63,50), dan sikap (70,67). Sementara itu, tingkat inklusi adalah 72,18%. Hal ini ditentukan oleh 11 indikator. Oleh karena itu, terdapat perbedaan tingkat 5,89% antara literasi dan inklusi. Kondisi ini menunjukkan bahwa tingkat inklusi pupuk organik sedikit lebih tinggi daripada tingkat literasi. Implikasi kebijakan disampaikan kepada para pengelola APOB untuk meningkatkan literasi dan inklusi pupuk organik melalui program pelatihan dan lokakarya. Lebih lanjut, pemerintah daerah dapat memfasilitasi pengembangan bisnis dan pendampingan dalam produksi dan pemanfaatan pupuk organik.

Kata kunci: *Literasi; Inklusi; Pupuk Organik; APOB*

Abstract

Organic farming products are beneficial not only to people's well-being, but also to the environment's long-term viability. One of the cooperatives producing organic agricultural products in Central Java Province is the Boyolali Organic Farmers Association (APOB). APOB has two problems, namely: the lack of organic fertilizer literacy and inclusion for managers and members. Therefore, this study attempts to assess the levels of organic fertilizer literacy and inclusion. The period of assessment was during July-August 2025. The primary data were collected using focus group discussion and in-depth interview involving 15 APOB managers and members. The method was descriptive statistics. The findings reveal that the literacy level of organic fertilizer was 66.29%. The level is determined by knowledge (64.71), behaviour (63.50), and attitude (70.67). Meanwhile, the inclusion level was 72.18%. It is determined by 11 indicators. Therefore, there is 5.89% difference level between literacy and inclusion. This condition illustrates that the level of organic fertilizer inclusion is slightly higher than the literacy level. Policy implications are delivered to APOB managers to increase organic fertilizer literacy and inclusion through training programs and workshops. Furthermore, the local government can facilitate business development and mentoring in organic fertilizer production and utilization.

Keywords: *Literacy; Inclusion; Organic Fertilizer; APOB*

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Introduction

The prevalence of organic farming is increasing in tandem with the recognition of its numerous advantages. The aforementioned benefits encompass a range of aspects include soil fertility, healthy and environmentally sustainable products, and environmental quality. Indriyati et al. (2024) paid more attention on the stagnation of agricultural land productivity and the environmental degradation resulting from the utilization of chemical fertilizers and pesticides. Consquently, the condition led to an augmentation in the viability of organic agricultural products. A notable distinction emerges in the quality of rice fields when comparing the use of organic fertilizers with that of chemical fertilizers in Tegal Regency. Organic rice fields demonstrate a propensity to yield higher-quality products while concurrently ensuring environmental quality.

Furthermore, the current study examines the utilization of organic fertilizers by the Boyolali Organic Rice Producers Association (APOB). The organic fertilizers were gauged in relation to the literacy and inclusion perceptions of APOB managers and members. The business's legal entity is that of a cooperative in Boyolali Regency. This cooperative has effectively managed the harvest from 101 hectares of rice fields, with an organic harvest area reaching 30 hectares since 2013. The cooperative comprises 1,842 organic farmers.

A pervasive challenge confronting APOB is the effective and high-quality production and utilization of organic fertilizer. The effective production of fertilizers is contingent upon the composition and amalgamation of livestock and plant materials. Concurrently, the development of sophisticated organic fertilizers has led to formulate a user-friendly in rice fields. Besides, APOB faces two problems for managers and members cover literacy level and inclusion level. Consequently, it is imperative to implement assessments that evaluate the literacy and inclusion of organic fertilizers among managerial personnel. These assessments ensure that the production and utilization of organic fertilizers align with established expectations and standards.

The assessment of organic fertilizer literacy and inclusion levels confers numerous advantages. Initially, in-depth interviews were conducted with managers to ascertain their comprehension of the organic fertilizer production process. These interviews ensured that the quality of organic fertilizer contributes to increased productivity. Secondly, the local government implemented training programs to enhance comprehension of organic fertilizers. However, the local government has not provided any assistance in the production of organic fertilizers, including production machinery. Thirdly, the process of organic fertilizer production is characterized by its simplicity. The production considered human resource capacity and the distribution of fertilizer to members of the farming community. Fourthly, the organic fertilizer production is still impeded by the absence of machinery capable to produce solid (crystal) fertilizer granules.

The current study aims to assess the levels of organic fertilizer literacy and inclusion within the Boyolali Organic Farmers Association (APOB). Moreover, it contributes to the several ways. First, the level of organic fertilizer literacy and inclusion remains an understudied area in the extant literature. Second, the study selects APOB as a case study due to its strategic initiative to develop an organic food business in national market. Third, policy implications emphasize increasing organic fertilizer production and distribution to all members (farmers). Additionally, universities contribute a substantial role by developing modules on the composition of organic fertilizer and the quality management of the production process.

The utilization of organic fertilizers has been illustrated to be a significant factor in enhancing business efficiency of fruit cultivation (Ngawit et al., 2024). The enhancing farmers' comprehension of organic fertilizers can be accomplished through training and mentoring programs. Li et al. (2024) posited that the implementation of organic fertilizers fosters the development of sustainable agricultural practices. Besides, the digital transformation of agricultural enterprises facilitates the acquisition and utilization of organic fertilizers by farmers. This condition has stimulated higher agricultural profits. Bhatt & John (2023) and Wang et al. (2025) reported that organic fertilizer is beneficial for ensuring environmental quality, sustainable agricultural systems, and boosting agricultural

productivity. Concurrently, Zhang et al. (2025), Carpanez et al. (2025), and Cao et al. (2025) expound on the utilization and ramifications of organic fertilizers, contingent on their composition, nutrients, and manufacturing process.

In particular, Darmindra et al. (2023) investigated farmers' practices on the utilization of organic fertilizers in Karanganyar Regency. The study revealed that farmers' knowledge level of the utilization of organic fertilizers was 68.21%, which falls within the moderate category. Additionally, their attitude level of organic fertilizers attained 82.64%, categorizing it as high. These findings motivated the current study to explore and measure the literacy and inclusion levels of organic farmers in Boyolali. The current study contributes significantly on the assessment of organic fertilizer literacy and inclusion. Consequently, it develops the existing body of knowledge on organic fertilizers and agriculture business.

Method

A series of measurements were conducted in order to assess the literacy and inclusion levels of organic fertilizer among managers and members of APOB. The data were obtained from primary sources from July to August of 2025. It was collected by focus group discussions (FGDs) and in-depth interviews. Focus group discussions (FGDs) were conducted to ascertain the existing understanding and utilization of organic fertilizer. This identification was also used to strengthen the factors shaping organic fertilizer literacy and inclusion levels. The sample size of the study comprised 15 respondents, including managers and members. The selection of respondents was conducted through manager recommendations and prioritized farmers who have demonstrated optimal utilization of organic fertilizer. Concurrently, in-depth interviews were conducted to enhance the explanations regarding the measurement of organic fertilizer literacy and inclusion levels.

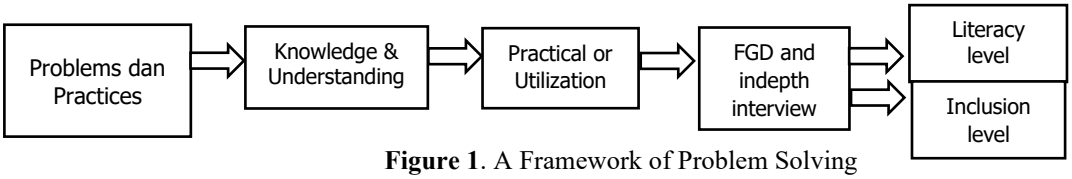

Figure 1. A Framework of Problem Solving

Figure 1 delineates the methodology employed to assess organic fertilizer literacy and inclusion levels in APOB. In the preliminary stage, a problem identification and practice process was conducted to ascertain the extent to which APOB managers and members comprehended the concept and practice of organic fertilizer. This stage was conducted in early July 2025 through in-depth interviews. The initial findings from the first stage were subsequently corroborated in the subsequent stages. The subsequent stage centered on the acquisition of knowledge and understanding concerning the process of organic fertilizer production. At this stage, knowledge and understanding were enhanced through training at the end of July 2025. The third stage was the production of organic fertilizer, which was carried out through business mentoring at the beginning of August 2025.

The process of evaluating organic fertilizer literacy and inclusion levels commenced with a focus group (FGD) and in-depth interviews with 15 APOB managers and members at the ending of August 2025. In this stage, respondents exhibited a comparatively superior comprehension and more refined practices in the utilization of organic fertilizers. The FGD was employed into two sessions, namely: literacy session and inclusion session. The session was facilitated by Mr. Malik Cahyadin as head of research team. Several statements/questions regarding literacy and inclusion were delivered to the managers and members. The indicators of measurement can be seen at Table 3 and 4. The final phase of the study yielded the results of organic fertilizer literacy and inclusion levels (see Table 3 and 4).

Several studies have identified factors that influence organic fertilizer literacy. For instance, Darmindra et al. (2023) conducted a study in which they posed seven inquiries to farmers in Karanganyar Regency concerning their comprehension and awareness of organic fertilizers. The literacy measurement scale employed a range of 0-100%. The distribution of literacy measurement results was grouped into three categories: The severity of the condition was categorized as follows: low (33.33-55.55%), moderate (55.60-77.77%), or high (77.78-100%).

Furthermore, this study adopts the organic fertilizer literacy questionnaire developed by Darmindra et al. (2023) with several enhancements. The initial enhancement highlighted three components of literacy assessment: knowledge, behaviour, and attitude. These three aspects were expected to enhance the precision of measurement outcomes and streamline the comprehension of organic fertilizer literacy assessment. The knowledge, behaviour, and attitude aspects employ several indicators cover 7 indicators, 4 indicators, and 6 indicators. Concurrently, the inclusion level measurement was derived from a focus group discussion (FGD) process and in-depth interviews with APOB managers and members. The level of organic fertilizer inclusion was determined by a list of eleven statements. All indicators were identified following Darmindra et al (2023) and FGD with managers of APOB.The measurement scale for organic fertilizer literacy and inclusion levels utilized a 0-100% scale. The respondents can select a specific scale following their preference. Specifically, both measurement methods employed descriptive statistics. This method is useful for revealing the distribution of perceptions of organic fertilizer literacy and inclusion in percentage units. Furthermore, all perception levels of literacy and inclusion were analyzed using descriptive statistics. The method is a simple and proper technique to describe the distribution of literacy and inclusion levels.

Finding And Discussion

Finding

The assessment comprised multiple stages or activities, including the measurement of organic fertilizer literacy and inclusion levels (see Table 1). The assessment of organic fertilizer literacy entailed deliberations on the foundational principles of organic fertilizers. The objective of these discussions was to ascertain the participants' knowledge and understanding of organic fertilizers, with a focus on their potential to enhance agricultural productivity and environmental quality. These activities were conducted during July 2025. The culmination of this endeavor was the measurement of organic fertilizer literacy levels.

The subsequent phase involves the quantification of the level of organic fertilizer inclusion using a series of methodologies. In August of 2025, a discussion was held on the subject of organic fertilizer usage by farmers. The findings of this endeavor included the identification of statements as measuring factors for the level of organic fertilizer inclusion.

Table 1. Literacy and inclusion assessment of organic fertilizer

Criteria	Activity	Objective
Literacy	- Discussion on the general concept of organic fertilizer - Identification of organic fertilizer from production, packaging, distribution until utilization - Identification of knowledge and information sources on organic fertilizer - Identification of farmer and family behavior on organic fertilizer - Identification of farmer and family attitue on organic fertilizer - Assessment of literacy level on organic fertilizer	- To identify the knowledge and information sources on organic fertilizer - To assess the knowledge level of organic fertilizer - To assess the behaviour level of organic fertilizer - To assess the attitude level of organic fertilizer - To assess the literacy level of organic fertilizer
Inclusion	- Discussion on the implementation of organic fertilizer - Identification of strengthen and weakness factors determine organic fertilizer in agriculture production process. - Identification of family contribution on organic fertilizer implementation. - Assessment of inclusion level on organic fertilizer	- To identify the implementation of organic fertilizer. - To identify the strengthen and weakness factors determine organic fertilizer in agriculture production process. - To identify family contribution on organic fertilizer implementation. - To assess the inclusion level or organic fertilizer.

A total of 15 respondents were selected for the current study. The respondents included both managers and members of APOB. The selection process involved a careful consideration of recommendations provided by the APOB managers. In addition, the farmers engaged in the active development and utilization of organic fertilizers. The demographic characteristics of the respondents are delineated in Table 2. The distribution of respondents by sex consisted of 10 males (66.67%) and 5 females (33.33%). This finding suggests that individuals engaged in the production of organic fertilizers are predominantly male.

The respondents' ages were distributed into the following three categories cover the ages of 20 and 40, ten individuals between the ages of 41 and 60, and two individuals over the age of 60. The distribution of respondents based on age was as follows: 20.00% were in the 20s, 66.67% were in the 30s, and 13.33% were in the 40s. The predominant proportion of respondents were APOB members, constituting 9 individuals (60.00%), while the remaining 6 persons (40%) were managers.

Table 2. Respondent characteristics

Sex	person	%
Male	10	66.67
Female	5	33.33
Total	15	100.00
Age (year)	person	%
20-40	3	20.00
41-60	10	66.67
> 60	2	13.33
Total	15	100.00
Status in the organization	person	%
Manajer	6	40.00
Member	9	60.00
Total	15	100.00

Source: Primary data (processed, 2025)

As depicted in Figure 2, the organic fertilizer literacy discussion was held at the APOB Office in July 2025. The objective of this activity was to assess the knowledge and understanding of APOB administrators and members regarding organic fertilizer. During this activity, participants engaged in the provision of information and opinions. The expressed opinions are indicative of the respondents' knowledge and understanding of organic fertilizer. The objective of this activity was to ascertain the level of organic fertilizer literacy.

Furthermore, the activity at Figure 2 identifies several indicators of literacy level. The research and community empowerment teams set seven indicators of knowledge, four indicators of behaviour, and six indicators of attitude. All indicators are assessed using 0-100% scale. At this condition, all respodents select a specific scale following their preference.

Source: PSP-KUMKM LPPM UNS (2025)
Figure 2. Discussion of organic fertilizer literacy

In the following section, the results of the organic fertilizer literacy measurement are presented in Table 3. The literacy level of an individual is determined by three distinct aspects: knowledge, behavior, and attitude. Each aspect is endowed with a series of indicators, amounting to a total of 17 indicators. The scale of measurement for literacy employs a numerical range from 0 to 100%. There is a direct correlation between the scale selected by respondents and the level of literacy attained. As the scale chosen by respondents ascends, the level of literacy achieved concomitantly rises.

Table 3. Literacy level of organic fertilizer

No.	Statement	Percentage (0-100)	Criteria
A. Knowledge			
1	The concept of "organic fertilizer" is one with which I am well-versed.	68	Moderate
2	The functionality of organic fertilizers is a subject with which I am thoroughly familiar.	65	Moderate
3	I am cognizant of the advantages and ramifications of organic fertilizers.	62	Moderate
4	I possess knowledge regarding the categories of organic fertilizers.	70	Moderate
5	The intricacies of the production processes of liquid and solid fertilizers are comprehended.	60	Moderate
6	The ingredients necessary for the production of organic fertilizers are sourced from this region.	65	Moderate
7	The consequences of these practices on land productivity and environmental quality are well understood.	63	Moderate
Average		64.71	Moderate
B. Behaviour	Statement	Percentage (0-100)	Criteria
1	I engaged in active discourse concerning the subject of organic fertilizers.	62	Moderate
2	I am currently engaged in an intensive training program focused on the production of organic fertilizers.	60	Moderate
3	The utilization of organic fertilizers is a practice that has garnered my endorsement.	75	Moderate
4	I engaged in the fabrication of organic fertilizers.	57	Moderate
Average		63.50	Modereate
C. Attitude	Statement	Percentage (0-100)	Criteria
1	The production of organic fertilizers involves the utilization of natural materials sourced from the immediate environment of the village.	68	Moderate
2	The utilization of organic fertilizers constitutes an efficacious strategy for enhancing land fertility, thereby promoting optimal agricultural yields and environmental sustainability.	72	Moderate
3	The utilization of organic fertilizers can contribute to the preservation of environmental quality.	75	Moderate
4	The utilization of organic fertilizers has enhanced agricultural productivity.	74	Moderate
5	The utilization of organic fertilizers has increased the capacity of agricultural revenue for farmers.	70	Moderate
6	The raw materials required for the production of organic fertilizer are readily obtainable and in ample supply.	65	Moderate
Average		70.67	Moderate
Literacy level		66.29	Moderate

Source: Primary data (processed, 2025)

The category designated as "Knowledge" received an average score of 64.71%. This finding was supported by the perception indicator of good knowledge about organic fertilizer types, which was 70%. The subsequent aspect pertained to behavior, which received a score of 63.50%. A notable contributing factor to this phenomenon was the utilization of organic fertilizer by farmers following their capacity. The indicator in question achieved a score of 75%. The final aspect was attitude, which scored 70.67%. Another salient indicator is the use of organic fertilizers, which is instrumental in ensuring environmental quality. The indicator in question achieved a score of 75%.

To ascertain the extent of organic fertilizer inclusion, the current study employed a combination of FGDs and in-depth interviews, conducted in August 2025. The activity was constituted by the implementation of an organic fertilizer production practice at the APOB office. The activity facilitated farmers' comprehension of the process of combining organic fertilizer ingredients. The resulting combination of fertilizer ingredients yielded a high-quality, and user-friendly organic fertilizer product (Figure 3). Concurrent with the organic fertilizer production practice, in-depth interviews were conducted to obtain more accurate and precise information and measurement of inclusion levels. Besides, the activity can support the indicators and assessment process of inclusion level.

Source: PSP-KUMKM LPPM UNS (2025)
Figure 3. Discussion of organic fertilizer inclusion

Table 4. Inclusion level of organic fertilizer

No.	Statement	Percentage (0-100)	Criteria
1	The production of organic fertilizer has been undertaken.	68	Moderate
2	The utilization of liquid organic fertilizer has been implemented.	58	Moderate
3	The utilization of solid organic fertilizer has been a part of this process.	83	High
4	The use of organic fertilizers, in both liquid and solid forms, has been employed.	77	Moderate
5	The composition of the organic fertilizer that is produced conforms to the established standards.	79	High
6	The organic fertilizer that is being produced is adequate to satisfy the requirements for agricultural fertilizer.	68	Moderate
7	APOB provides support for the acquisition of organic fertilizers that are utilized by farmers.	82	High
8	The APOB has the capacity to produce the requisite organic fertilizers that are in high demand among agricultural professionals.	78	High
9	It is important to note a certain degree of apprehension regarding the utilization of organic fertilizers over an extended period.	74	Moderate
10	The utilization of organic fertilizer has prompted apprehensions among members of the family.	66	Moderate
11	The family's involvement in the production of organic fertilizer is a matter of active engagement.	61	Moderate
Inclusion level		72.18	Moderate

Source: Primary data (processed, 2025)

The measurement of the organic fertilizer inclusion rate is outlined in Table 4. The inclusion rate is influenced by a total of eleven indicators, which collectively contribute to a final rate of 72.18%. The inclusion rate is influenced by three indicators: the utilization of solid organic fertilizer (83%), the APOB's endorsement of organic fertilizer application (82%), and the optimal composition of organic fertilizer raw materials (79%). This finding suggests that the application of APOB and the organic fertilizer process have enhanced the efficacy of the fertilizer.

Discussion

The findings of the study, which focused on the assessment of organic fertilizer literacy and inclusion levels, underscore farmers' capacity to generate agricultural products by considering healthy and environmentally sustainable. The utilization of organic fertilizers has been demonstrated to enhance agricultural productivity (Bahri et al., 2023). Consequently, there is a necessity for farmers to receive training and mentorship programs in the utilization of organic fertilizers. Furthermore, these programs directly impact farmers' knowledge and skills will be met with a high level of engagement and enthusiasm.

Tabel 5 provides a detail levels of literacy and inclusion of organic fertilizer between manager and member. The literacy level of manager is little bit higher than (67.30%) that of member (65.25%). The total level of literacy is about 66.29% (moderate). Interestingly, the value of behaviour indicator is smallest. The condition illustrates that the respondents receive a minimum training program from local government or university.

Tabel 5. Summary of literacy and inclusion levels of organic fertilizer

No.	Literacy and Inclusion Levels	Manager	Member	Total (%)	Criteria
A. Literacy level		67.30	65.25	66.29	Moderate
1	Knowledge	65.54	63.85	64.71	Moderate
2	Behaviour	64.10	62.75	63.50	Moderate
3	Attitude	71.35	69.90	70.67	Moderate
B. Inclusion level		74.05	70.35	72.18	Moderate
C. Literacy - Inclusion				5.89	

Source: Primary data (processed, 2025)

Furthermore, the inclusion level is about 72.18% (moderate). The level can be traced for manager and member of APOB. The inclusion level of manager (74.05%) is higher than that of member (70.35%). The condition means that manager can utilize organic fertilizers in a better way to stimulate productivity of organic products. Besides, APOB delivers a high commitment and support for all organic farmer to use organic fertilizers.

Specifically, the mean difference in literacy and organic fertilizer inclusion levels among APOB farmers was 5.89% (see Table 5). This finding suggests that the level of knowledge and understanding regarding organic fertilizer does not exhibit a significant discrepancy. Additionally, no substantial disparities were observed in the scores pertaining to the literacy-forming aspects. This condition suggests that farmers' knowledge, behavior, and attitudes regarding organic fertilizer are relatively balanced.

The current study reveals a lower level of knowledge indicator (64.71%) than that found by Darmindra et al. (2023) in farmer group of Karanganyar Regency (68.21%). Besides, the level of attitude indicator of APOB is also lower than that of Karanganyar Regency (82.64%). The condition means that APOB needs more literacy or organic fertilizer than the farmer group of Karanganyar Regency.

The cooperative of organic rice farmers places significant emphasis on and endeavors to optimize the utilization of organic fertilizer. It continues to encounter challenges in producing high-quality organic fertilizer on a large scale. Empirical findings indicate that chemical fertilizers and pesticides have decreased productivity and land fertility. This condition needs a breakthrough in the use of organic fertilizers from animal and plant waste (Andharesta & Sundahri, 2024). The judicious amalgamation of organic fertilizer ingredients has been demonstrated to high-quality fertilizers and enhance crop productivity (Hidayat et al., 2024).

The cultivation of heightened literacy concerning organic fertilizers, alongside their incorporation, necessitates the preservation of environmentally sustainable agricultural practices. Huang et al. (2025) posit that agricultural insurance plays a pivotal role in facilitating the adoption of green and sustainable agricultural practices. The existence of agricultural insurance has been demonstrated to encourage farmers to strengthen the use of environmentally friendly agricultural production materials. This assertion is corroborated by Li et al. (2024) and Lu et al. (2025) who contend that the digital transformation can concomitantly enhance the utilization of organic fertilizers. This digital transformation has the potential to reduce operational costs for agricultural businesses and accelerate the process of land fertilization. Furthermore, Li et al. (2025) emphasize that the implementation of organic fertilizer application within an organic agricultural ecosystem is paramount. This condition signifies that organic fertilizer constitutes a green or environmentally friendly agricultural ecosystem.

Conclusion And Implication

Conclusion

APOB constitutes a cooperative of organic farmers located in Boyolali Regency. This cooperative ensures the rice production process utilizes an organic system and also empowers farmers to succeed in organic farming businesses. The significant aspects that necessitate assessment are the level of literacy and inclusion of organic fertilizer. Therefore, the current study measures the level of literacy and inclusion of 15 respondents (managers and members) of APOB. The findings describe that the level of literacy is determined by three distinct aspects, namely: knowledge, behavior, and attitude. The values for each aspect are 64.71%, 63.50%, and 70.67%, respectively. Besides, the level of literacy for manager is higher than that of for member of APOB. Consequently, the literacy level attained 66.29%. Conversely, the extent of inclusion is ascertained by multiple statements, yielding a value of 72.18%. The contribution of manager in utilization of organic fertilizer is higher than that of member of APOB. This finding signifies that the observed variation in literacy and inclusion levels is 5.89%. Therefore, it contributes significantly to stimulate the higher level of organic fertilizer literacy and inclusion. Besides, the findings provide new empirical evidence of literacy and inclusion levels in organic agriculture literature.

Limitation and Implication

The current study has several limitations. First, it selects only 15 respondents (managers and members of APOB). Second, the current study assesses organic fertilizer literacy and inclusion use in-depth interview. The condition means it does not employ a field or direct verification on the organic fertilizer utilization in the farming area. Third, the assessment period is very short.

Furthermore, there are several implications. First, the APOB Management can facilitate increased organic fertilizer literacy through training. This activity can be carried out in collaboration with universities. Second, increasing the incorporation of organic fertilizers can be achieved by centralizing their storage and distribution at APOB. Universities can contribute by assisting production process and ensuring quality control. Local governments can facilitate a fertilizer machinery to produce solid organic fertilizers. Third, farmers and families have the opportunity to enhance awareness, knowledge, and long-term utilization of organic fertilizer.

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