

## Empowerment of PKK Groups and Agro Rimba Abadi Forest Farmer Groups through Strengthening the Green Economy to Improve Economy Welfare

Siti Patonah<sup>1\*</sup>, Hisyam Ma'mun<sup>2</sup>, Ervina Eka Subekti<sup>1</sup>, and Eka Adi Supriyanto<sup>3</sup>

<sup>1</sup>Primary School Teacher Education, Faculty of Education, Universitas PGRI Semarang, Semarang, Indonesia

<sup>2</sup>Faculty of Engineering and Informatics, Universitas PGRI Semarang, Semarang, Indonesia

<sup>3</sup>Faculty of Agriculture, Universitas Pekalongan, Pekalongan, Indonesia

\*sitifatonah@upgris.ac.id

| Article Info                                                                                                                                                                                                                                                                                                                                                                                                     | Abstract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <p><b>Article history:</b><br/> Received: September 26, 2025<br/> Accepted: January 31, 2026<br/> Published: March 4, 2026</p> <p><b>Keywords:</b><br/> Assisted village<br/> Community empowerment<br/> Green economy</p> <p>This article is licensed under a <a href="#">Creative Commons Attribution-ShareAlike 4.0 International License</a></p> <p>© 2026 Bubungan Tinggi: Jurnal Pengabdian Masyarakat</p> | <p>The implementation of the green economy requires massive and sustainable training and workshops. The purpose of this activity is to provide integrative training in implementing the green economy in rural areas for the PKK group and the Agro Rimba Abadi forest farmer group. The method used is <i>participatory action research</i> (PAR). Participants are involved in all activities, including collecting data on the necessary training needs and following up on activities after participating in the training. There are 4 training themes, namely: pineapple cultivation, designing products suitable for sale, business licenses, and e-commerce. The results obtained were: increased understanding of partners consisted of 3 groups, namely: experiencing an increase, not experiencing change, and experiencing a decrease. A total of 67% of participants had an increased understanding of the theme of "pineapple cultivation", 81% of participants did not experience a change in understanding of the training theme "business license", and 19% of participants experienced a decrease in understanding of the theme of "plant cultivation". Training activities by proposing business licenses, creating online marketplaces, and making more attractive product designs so that they can increase community income.</p> |
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### INTRODUCTION

Countries around the world have been competing to implement the green economy as an economic vision, including Indonesia. In Indonesia, the green economy is one of the pillars of the *Indonesia Emas 2045* vision. This is because the goals of the green economy align with society's needs amid increasing environmental degradation—namely, improving welfare while reducing environmental damage and ecosystem imbalance (Patonah et al., 2025; Rahardjo et al., 2023). The green economy encourages the optimization of natural resources as sources of economic income and promotes wise waste management so that economic growth does not harm the environment (Anwar, 2022; Kristanto, 2020). According to Firmansyah (2022), the green economy is economic development that prioritizes environmental sustainability, provides both short- and long-term (sustainable)

benefits, and reduces inequality for present and future generations. It seeks long-term social benefits through short-term activities, leading to improved human welfare and reduced inequality without exposing future generations to significant environmental risks or ecological deficits ([Wahida & Uyun, 2023](#)). There are three indicators of the green economy: (1) Sustainable economy – ensuring environmental preservation while allowing humans to benefit from nature. (2) Low carbon – reducing industrial reliance on fossil fuels. (3) Environmentally friendly practices – making wise decisions in utilizing natural resources with minimal damage and taking preventive actions against environmental impacts.

Considering the importance of implementing the green economy, several efforts are needed, including a multidisciplinary approach. The green economy requires collaboration among various stakeholders; therefore, community empowerment is a key element in its implementation. For example, green economy initiatives can be implemented through PKK groups and the Agro Rimba Abadi forest farmer group. These groups are located in Mendelem Village, Belik District, Pemalang Regency, Central Java.

The main commodity of this village is pineapple, which is typically sold only as fresh fruit. Pineapples are collected by middlemen and distributed to wholesalers across Central Java and Jakarta. This system benefits middlemen as the business chain connecting farmers and buyers. Some farmers sell pineapples before they are fully ripe and are bound to initial price agreements, limiting their ability to respond to market demand. The abundant pineapple resources offer significant opportunities to utilize not only the fruit but also the peel and leaves. Production activities inevitably generate waste, which can be processed into derivative products.

During the first year of community assistance, only about 20% of participants had heard the term “green economy,” and they did not understand its meaning or implementation. The team introduced and facilitated the implementation of the green economy in rural communities. Theory and practice were integrated, as theory without practice is ineffective, and practice without theory lacks efficiency and strategic direction. Several factors hinder the optimization of village potential as a sustainable income source, including: limited access to technology, lack of information about the green economy, insufficient supporting infrastructure, and lack of continuous mentoring. Therefore, optimizing village natural resources into sustainable economic income requires: improving human resource capacity through continuous training and socialization, access to technology, access to village funding, and strengthening structured and mutually supportive institutions. The purpose of this paper is to describe green economy-based village empowerment practices through continuous training and mentoring.

## METHODS

The method used in this community service program was Participatory Action Research (PAR) ([Rahmat & Mirnawati, 2020](#)). Partners not only received knowledge transfer but also actively participated in preparation and post-training follow-up activities ([Utomo et al., 2023](#); [Zunaidi, 2024](#)). Preparation activities included coordination with partners to determine necessary activities and team roles. These were conducted through discussions and knowledge-sharing sessions ([Jaya et al., 2024](#); [Sahri & Paramita, 2020](#)), ensuring that partners felt involved and that activities aligned with their expectations.

This program is in its second year under the Assisted Village Empowerment (PDB) initiative, focusing on production and marketing aspects. The training aimed to strengthen the concept of the green economy and enhance its application in pineapple processing industries. Activities were conducted at the Mendelem Village Hall, Belik District, Pemalang Regency. The description of the activities is given in Table 1.

Table 1 Description of activities implementation

| No | Activities                                           | Implementation   | Target                                                                                                                                                          |
|----|------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Coordination with partners                           | June–July 2025   | Obtain information about challenges and weaknesses in implementing sustainable activities                                                                       |
| 2  | Strengthening Green Economy and Pineapple Processing | August 13, 2025  | Participants strengthen their understanding of the green economy concept, receive training on pineapple vinegar production, and share implementation challenges |
| 3  | Pineapple Cultivation Training                       | August 27, 2025  | Partners understand steps to improve pineapple fruit quality and utilize leaves for fiber production                                                            |
| 4  | Designing Marketable Products                        | August 27, 2025  | Participants design product labels and taglines with higher market value                                                                                        |
| 5  | Business Licensing Training                          | August 27, 2025  | Partners register products for halal certification and obtain certification                                                                                     |
| 6  | E-Commerce Training                                  | August 27, 2025  | Partners market standardized products through social media and online marketplaces                                                                              |
| 7  | Harvesting Green Economy Products                    | October 27, 2025 | Partners harvest pineapple vinegar and eco-enzyme products                                                                                                      |

## RESULTS AND DISCUSSION

The green economy is an important concept to introduce to communities intending to start businesses in processing food and beverages derived from natural resources. Socialization and counseling activities serve as the initial steps in the stages of community service implementation. The partners participating in this activity came from two groups: the PKK Group of Mendelem Village and the Agro Rimba Abadi Forest Farmer Group. A brief demographic profile of the training participants is presented in Table 2.

Table 2 Demographic profile of training participants

| Aspect          | Percentage (%) |
|-----------------|----------------|
| Gender          |                |
| Female          | 90             |
| Male            | 10             |
| Age             |                |
| 46-55 years     | 14             |
| 36-45 years     | 38             |
| 26-35 years     | 24             |
| 16-25 years     | 24             |
| Level Education |                |
| Elementary      | 48             |
| Secondary       | 9              |
| Senior High     | 9              |
| Jobs            |                |
| Wifehouse       | 67             |
| Entrepreneur    | 9              |
| Farmer          | 9              |
| Tailor          | 5              |

| Aspect          | Percentage (%) |
|-----------------|----------------|
| Therapist       | 5              |
| Beauty employee | 5              |

Based on Table 2, the participants were predominantly women (mothers), mostly elementary school graduates aged 36–45 years, and primarily housewives who relied on their husbands' income. The training activities began with pineapple cultivation training, delivered by Ir. Eka Adi Supriyanto from Universitas Pekalongan. The trainer provided guidance on maintaining pineapple plants to produce long leaves and high-quality fruit. Pineapple cultivation training is shown in Figure 1.



Figure 1 Pineapple cultivation training

To measure participants' understanding of proper pineapple cultivation techniques, ten yes/no questions were administered. Each item showed an increase in score from the initial condition (pre-test) to the final condition (post-test), as presented in Figure 2.

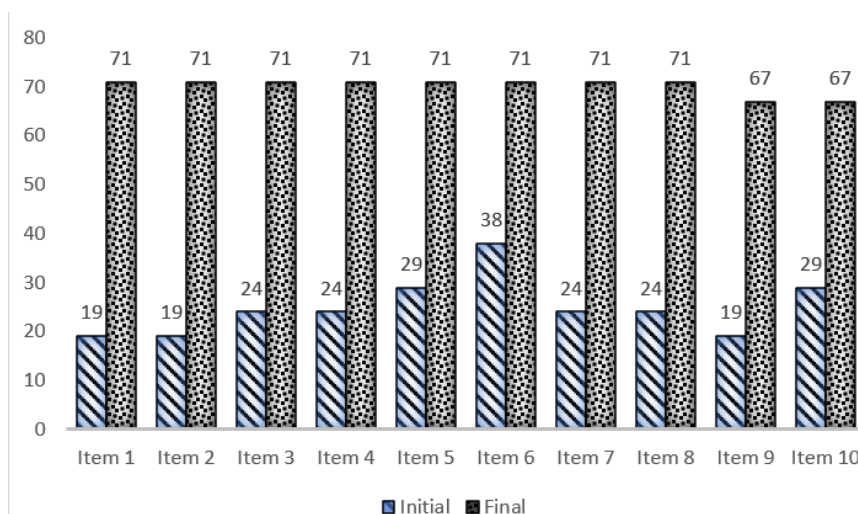


Figure 2 Pineapplu cultivation items

Based on Figure 2, 67% of participants experienced an increase in understanding, 14% showed no change, and 19% experienced a decrease in scores from the initial to the final

assessment. Participants' overall understanding of pineapple cultivation is shown in Figure 3.

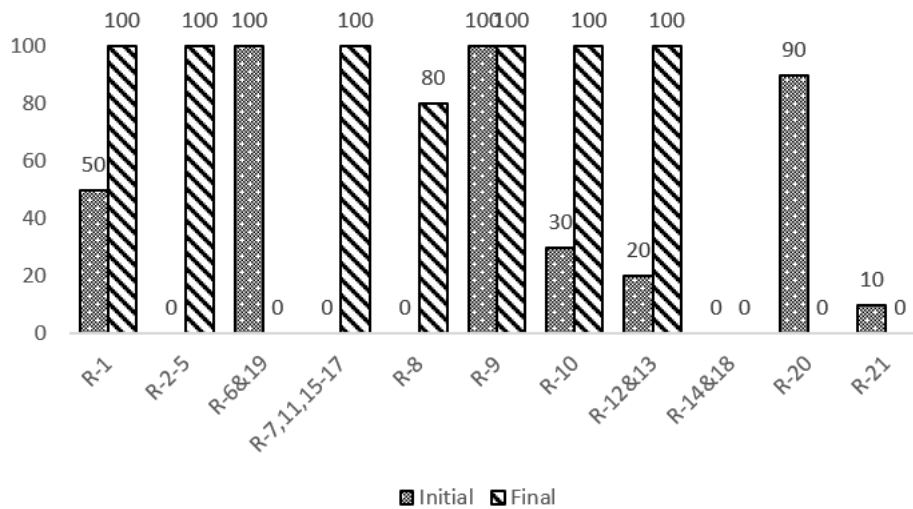


Figure 3 Participant profile of understanding of pineapple cultivation

Figure 3 indicates that questionnaire items number 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 15, 16, and 17 showed increased understanding scores among participants. Item scores remained consistently high only for respondent 9, while respondents 14 and 18 maintained consistently low scores. Meanwhile, respondents 6, 19, 20, and 21 experienced a decrease in scores. Overall, the profile of participants' understanding of pineapple cultivation shows that 67% experienced improvement, 19% experienced a decline, and 14% showed no change. If the mastery standard is set at 70, participants' understanding of pineapple cultivation is still categorized as relatively low. After gaining an understanding of pineapple cultivation, the next step was designing processed pineapple products. In this activity, participants were trained to identify the strengths and weaknesses of their products, develop product branding, create logos, and design product taglines. Through this activity, participants were not only able to ensure the quality and taste of their processed products but also to enhance their market value as a potential new source of income. Figure 4 presents the data on score improvements for product design items.

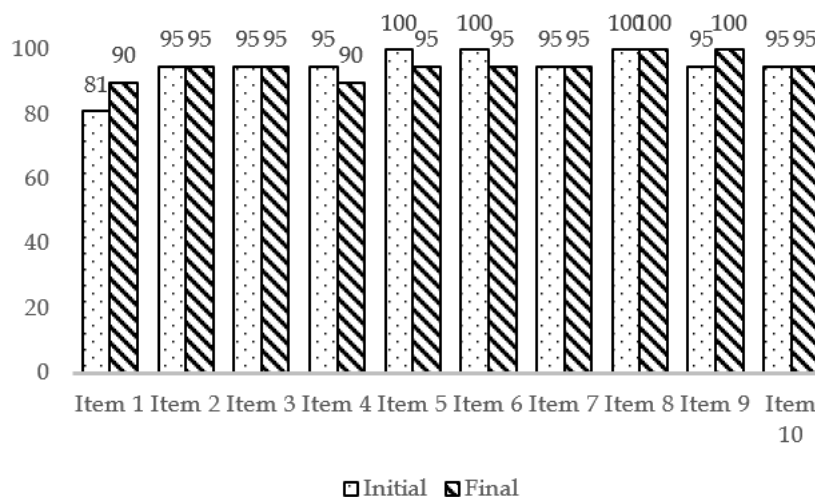


Figure 4 Item profile for product design

Based on Figure 4, there are three categories of items: items showing increased scores, items showing no change, and items showing decreased scores. Items with increased scores were numbers 1 and 9. Items with decreased scores were numbers 4, 5, and 6. Meanwhile, items 2, 3, 7, 8, and 10 showed no change in scores. Participants' overall understanding of product design skills is presented in Figure 5.

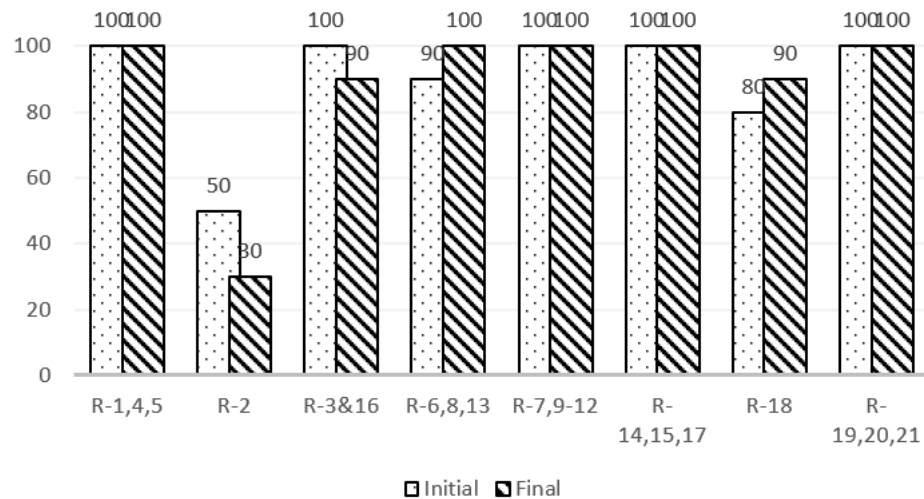


Figure 5 Profile of participants' understanding of product design

Based on Figure 5, three types of participants were identified: those whose scores increased, those whose scores remained unchanged, and those whose scores decreased. Participants who experienced score increases were numbers 6, 8, 13, and 18. Participants who experienced score decreases were numbers 2, 3, and 16. Meanwhile, 14 participants showed no change in scores, with relatively high overall scores. Unlike the pineapple cultivation knowledge scores, knowledge related to product design was relatively stable; however, the percentage of participants who experienced improvement was only 19%. After designing superior pineapple-processed products, participants were trained to obtain business permits, including Home Industry licenses and Halal certification. Figure 6 shows the score of each item before and after the training.

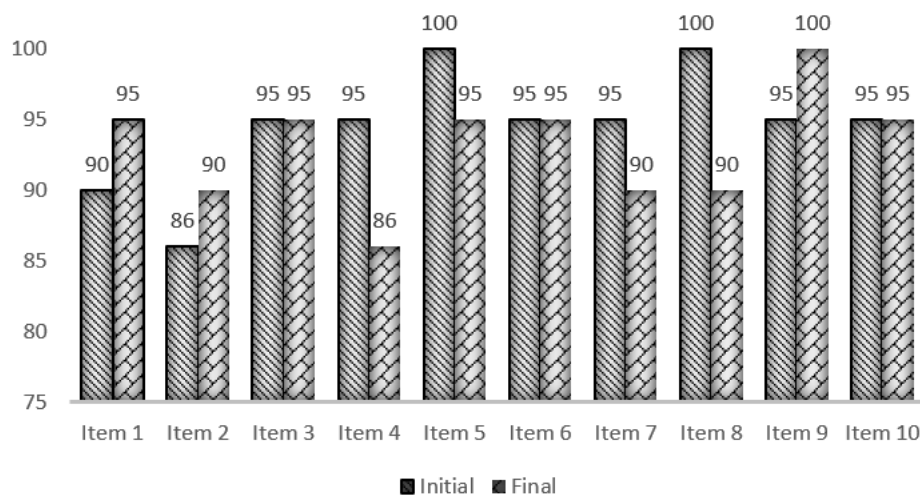


Figure 6 Business licensing

There are three categories of items: items that showed increased scores, items that showed no change, and items that showed decreased scores. Items with increased scores were numbers 1, 2, and 9. Items with unchanged scores were numbers 3, 6, and 10. Items 4, 5, 7, and 8 showed decreased scores. Participants' knowledge profile regarding business licensing procedures is presented in Figure 7.

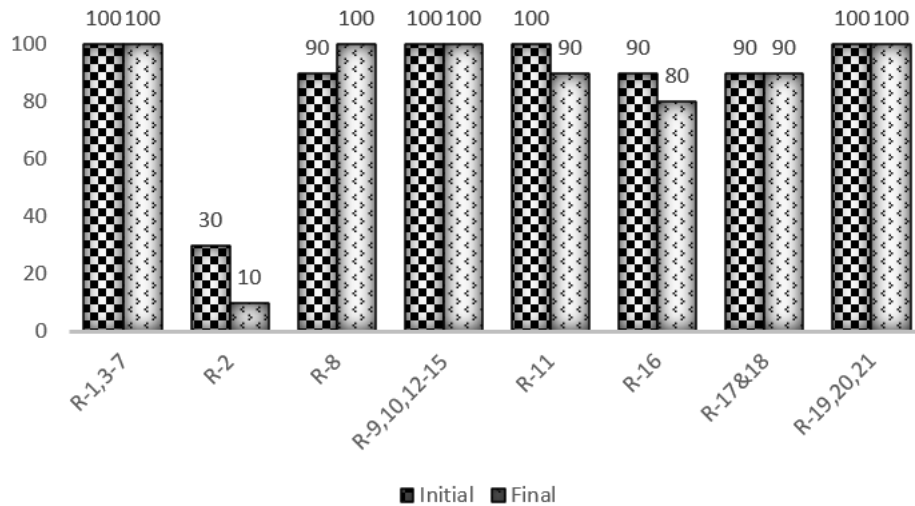


Figure 7 Profile of participants' understanding on the business licensing theme

Based on Figure 7, three groups of participants were identified before and after the training: those who experienced improvement, those who showed no change, and those who experienced a decline. Only participant number 8 showed improved knowledge. A total of 81% of participants showed no change before and after the training, while 14% experienced a decline. During this training, participants directly registered their products to obtain halal certification. After designing products and registering them for business permits, the next training focused on online marketing through social media and marketplaces. The profile of item responses is presented in Figure 8.

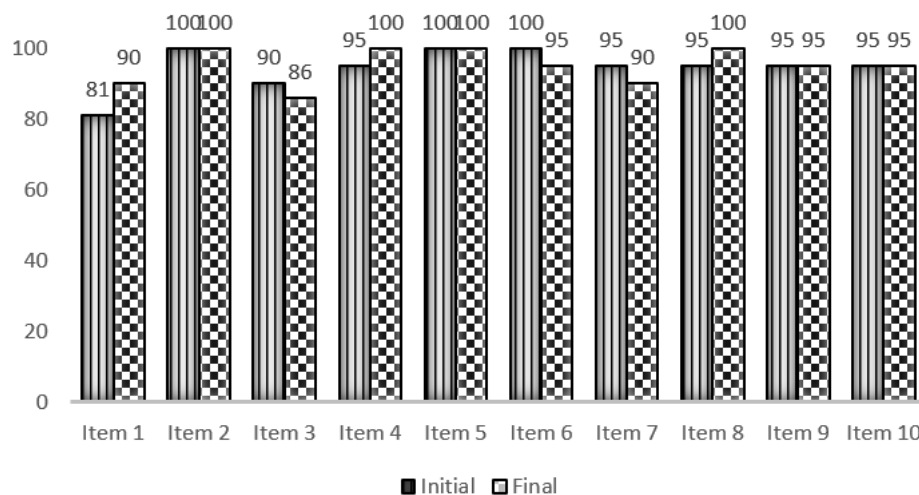


Figure 8 Profile of e-commerce items



Items that remained unchanged were numbers 2, 5, 9, and 10. Items that decreased were numbers 3, 6, and 7. Items that increased were numbers 1, 4, and 8. Participants' overall knowledge regarding e-commerce is presented in Figure 9.

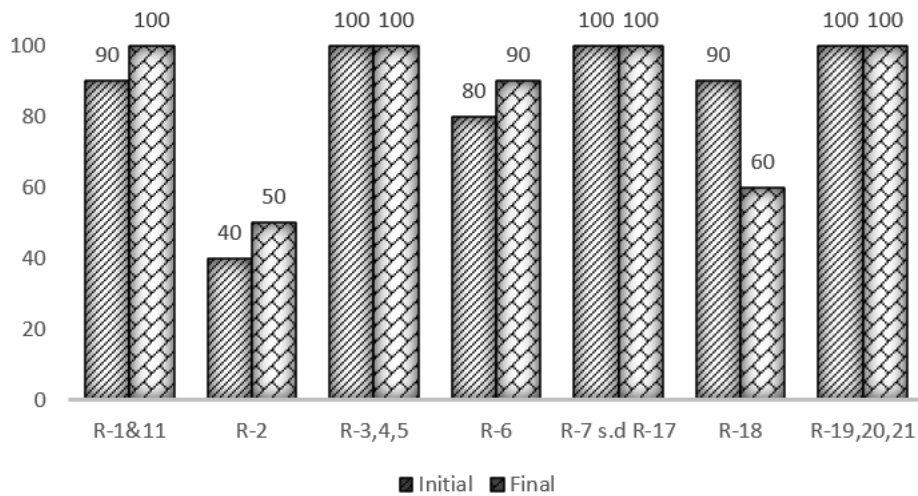


Figure 9 Profile of participants' understanding of e-commerce

Based on Figure 9, 76% of participants showed no change between the initial and final conditions, 19% experienced an increase in scores, and 5% experienced a decrease. Changes in participants' scores in community empowerment training are important indicators for evaluating program effectiveness. In this activity, three main conditions emerged: no increase in scores, decreased scores, and increased scores. Each condition has different implications for success or shortcomings in the context of community empowerment.

Among the four training themes, the highest improvement in participant understanding occurred in pineapple cultivation, followed by product design, e-commerce, and business licensing. The theme with the highest proportion of unchanged scores was business licensing, followed by e-commerce, product design, and pineapple cultivation. Meanwhile, the highest proportion of decreased scores occurred in pineapple cultivation, followed by product design, business licensing, and e-commerce.

Participants whose scores increased indicate that the training successfully improved their knowledge and skills ([Hati & Kurnia, 2023](#); [Triadi et al., 2022](#)). Pineapple cultivation was the theme with the greatest improvement compared to the others. This success was achieved through interactive learning methods, relevance to local needs, participant motivation, and a supportive environment ([Issalillah et al., 2024](#); [Trikesumawati et al., 2025](#)). In the context of community empowerment, a significant increase in scores reflects improved capacity and independence, which contribute to enhanced welfare and the ability to utilize resources sustainably. Participants felt that the topic was directly related to their daily activities. They actively provided feedback and raised objections when the material presented did not align with field realities. Pineapple cultivation discussions focused on efforts to improve fruit quality and utilize leaves for fiber production. This success can be followed up by establishing pilot or demonstration plots using scientific treatments to improve quality and later expanding them on a larger scale.

Participants whose understanding scores did not change fell into two categories: those who remained at high scores and those who remained at low scores. According to Staus, et.al (2021), initially high scores may indicate a ceiling effect, where participants had already mastered the material beforehand, limiting room for significant improvement.



Conversely, participants whose scores remained low may face fundamental learning challenges such as lack of motivation, unsuitable learning methods, or insufficient support and resources ([Acosta-gonzaga & Ruiz-ledesma, 2023](#); [Afiqah et al., 2024](#)).

Among the four themes, the theme with the highest proportion of unchanged scores was business licensing. This training aimed to obtain validation from buyers regarding product standardization related to home industry permits, BPOM registration, and halal certification. Interestingly, based on questionnaire analysis, fewer than 50% of participants initially had products, yet all participants registered their products for business permits. During this activity, participants were facilitated in registering their products for halal certification. Products included pineapple dodol, pineapple jam, pineapple sticks, pineapple vinegar, pineapple kombucha, palm sugar, banana chips, and cassava chips. However, only two groups successfully obtained halal certification. The absence of improvement in participant understanding indicates the need for more personalized learning approaches and continuous mentoring to help participants implement what they have learned ([Nugraha et al., 2023](#); [Rahmat & Mirnawati, 2020](#)).

On the other hand, participants whose low scores remained low may face fundamental learning difficulties, such as lack of motivation, inappropriate learning methods, or insufficient support and resources ([Acosta-gonzaga & Ruiz-ledesma, 2023](#); [Hasanah & Jannah, 2025](#)). Based on Graphs 2, 4, 6, and 8, the training theme that showed no change in scores—remaining at a low level—was the “pineapple cultivation training.” A decline in scores may occur due to internal and external factors ([Anhar et al., 2024](#); [Stafylidis et al., 2025](#)). Internal factors include disrupted concentration, which may result from a lack of attention during the delivery of the material. Decreased scores among several participants may be caused by either internal or external factors during the training process. Factors such as cognitive fatigue, stress, mental unpreparedness, or concentration difficulties can reduce participants’ performance in post-training evaluations. On the other hand, changes in assessment methods that are more challenging, or increased participant awareness of the complexity of the material, may also make scores appear lower even though actual understanding has improved critically ([Suprpto & Arda, 2021](#)).

## CONCLUSION

Community empowerment is a key factor in the successful implementation of the green economy. Empowerment can be achieved through information dissemination and socialization of practical steps communities can take to apply green economy principles. The PKK Group and the Agro Rimba Abadi Forest Farmer Group received training on pineapple cultivation, pineapple processing, product design, business licensing, and e-commerce marketing. All of these trainings equip partners with the skills necessary to generate and increase new sources of income while maintaining the sustainability of natural resources.

## CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

## AUTHOR CONTRIBUTIONS STATEMENT

Conceptualization, SP and HM; methodology, SP and EES; data collection, SP, HM, EES, and EAS; writing—preparation of the original draft, SP and EES; writing, reviewing, and editing, SP, EES, HM and EAS; All authors have read and approved the version of the manuscript.

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## AUTHOR PROFILES

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|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Dr. Siti Patonah, S. Pd, M. Pd<br/> <a href="mailto:sitifatonah@upgris.ac.id">sitifatonah@upgris.ac.id</a><br/> Master of Science Education, Universitas PGRI Semarang, Central Java, Indonesia.<br/> Expertise: Natural Science Education Inovation Learning based STEM and Environmental Awareness especially in Basic School.<br/> <a href="https://scholar.google.com/citations?user=MXu0UAcAAAAJ&amp;hl=id">https://scholar.google.com/citations?user=MXu0UAcAAAAJ&amp;hl=id</a><br/> Sinta ID: <a href="https://sinta.id/6087814">6087814</a><br/> <a href="https://orcid.org/0000-0001-5259-7599">https://orcid.org/0000-0001-5259-7599</a><br/> <a href="https://www.scopus.com/authid/detail.uri?authorId=57194040414">https://www.scopus.com/authid/detail.uri?authorId=57194040414</a></p> |
|  | <p>Hisyam Ma'mun, MT<br/> <a href="mailto:hisyam@upgris.ac.id">hisyam@upgris.ac.id</a><br/> Mechanical Engineering, Universitas PGRI Semarang, Central Java, Indonesia.<br/> Expertise: Material Science.<br/> <a href="https://scholar.google.com/citations?user=seuXdQEAAAAJ&amp;hl=en">https://scholar.google.com/citations?user=seuXdQEAAAAJ&amp;hl=en</a><br/> Sinta ID: <a href="https://sinta.id/6083285">6083285</a><br/> Orcid: <a href="https://orcid.org/0009-0001-5231-0276">https://orcid.org/0009-0001-5231-0276</a></p>                                                                                                                                                                                                                                                                   |

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|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Ervina Eka Subekti, S.Si, M. Pd<br/><a href="mailto:ervinaeka@upgris.ac.id">ervinaeka@upgris.ac.id</a><br/>Universitas PGRI Semarang, Central Java, Indonesia.<br/>Expertise: problem solving learning in elementary schools<br/><a href="https://scholar.google.com/citations?user=22F-hA8AAAAJ&amp;hl=id&amp;authuser=2">https://scholar.google.com/citations?user=22F-hA8AAAAJ&amp;hl=id&amp;authuser=2</a><br/>Sinta ID: 258963<br/>Orcid: <a href="https://orcid.org/0000-0002-4862-5689">https://orcid.org/0000-0002-4862-5689</a></p> |
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