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Analysis of the Social and Economic Impact of the JARI TANGAN Innovation Program on Community Empowerment in Indramayu Regency

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A B S T R A C T

Community empowerment programs in the agricultural sector aim to improve productivity, social change, institutional capacity, and community economic conditions. The JARI TANGAN (Kerja Tani Berdikari dan Tahan Pangan) program implemented by PT Pertamina EP Zona 7 Jatibarang Field integrates technological innovation, local resource management, community strengthening, business diversification, and market access development. This study analyzes the social and economic impacts of the program using a descriptive-analytical approach with a case study design. Data were collected through observation, interviews, documentation, and secondary sources. The results show increased empowerment capacity, with organic farming knowledge improving from 120 to 201 individuals, implementing groups from 3 to 7, beneficiaries from 41 to 102, and income increasing by approximately 50%. The findings indicate that innovation adoption, resource efficiency, institutional strengthening, and market access contribute to sustainable community empowerment.

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INTRODUCTION

The agricultural sector is crucial in sustaining rural communities by providing sources of income, employment, and food security (Arifa & Fahmi, 2025; Molina et al., 2026). However, dependence on agriculture creates various challenges, particularly when economic activities remain dependent on conventional production methods and external inputs, while facing limited access to technology and suboptimal market access. Such conditions can constrain the community's ability to increase the economic value of agricultural activities and maintain sustainable livelihoods (Akzar et al., 2023; Molina et al., 2026).

Changes in the social and economic conditions in rural areas require an empowerment approach that increases production, strengthens community capacity in technology adoption, local resource management, institutional development, business diversification, and market access. This approach positions the community as the primary driver of change, while the program functions as facilitators providing knowledge, technology, assistance, and network development (Cajaiba-Santana, 2014; Tjokropandojo et al., 2024).

Innovation in community development is crucial because it offers new approaches to address social and economic challenges (O'Shaughnessy et al., 2023; Molina et al., 2026). Social innovation relates to the use of innovative technology, changes in relationship patterns, institutions, capacities, and resource utilization mechanisms. The development of the JARI TANGAN Program integrates various innovations into agricultural activities and community empowerment efforts (Arifa & Fahmi, 2025; Kandel et al., 2025).

The JARI TANGAN (Kerja Tani Berdikari dan Tahan Pangan) an independent and food-secure farming program was developed through an approach that connects agricultural technology, the utilization of local resources, community capacity building, group strengthening, production diversification, and market access (Schulz et al., 2023; Arifa & Fahmi, 2025). Program implementation encompasses several innovations, including the use of renewable energy through Eco Agri Solar, the application of biological agents, agricultural waste conversion into organic fertilizer, the development of polyculture systems, community group strengthening, farmer regeneration, and the use of digital marketing (Tjokropandojo et al., 2024; Arifa & Fahmi, 2025). The integration of these various innovations creates an empowerment ecosystem aimed at generating social and economic change within the community.

Studies on community empowerment programs have often focused on increased production, the number of beneficiaries, or program implementation as indicators of program success (O'Shaughnessy et al., 2023; Arifa & Fahmi, 2025). While this approach is important, it does not fully explain the relationship between implemented innovations and changes in the social and economic conditions of communities. This situation indicates the need for a more integrative analysis of program impacts by connecting changes in capacity, institutional aspects, participation, and community income within a single analytical framework.

Although previous studies have examined community empowerment through agricultural innovation, many studies have primarily emphasized individual aspects such as productivity improvement, technology adoption, or economic outcomes. Limited attention has been given to understanding how innovation-based empowerment programs generate interconnected social and economic changes through the interaction between community capacity, institutional strengthening, innovation adoption, and economic value creation. Therefore, this study contributes by presenting an integrated perspective that explains how agricultural innovation programs create empowerment pathways from knowledge improvement to economic improvement.

This study extends previous research by analyzing the JARI TANGAN Innovation Program not only as an agricultural intervention but also as an empowerment ecosystem involving technological innovation, local resource utilization, community institutions, and market development. This integrated perspective provides empirical evidence regarding how corporate social responsibility-based innovation programs can support sustainable community empowerment in rural agricultural contexts.

Analyzing social and economic impacts is crucial for assessing the sustainability of empowerment programs, as the success of an innovation depends on the technology introduced and the community's ability to adopt, develop, and sustain it. Such analysis can reveal changes occurring at the individual, group, and household economic levels because of program implementation. Accordingly, this study aims to analyze the social and economic impacts of the JARI TANGAN Innovation Program on community empowerment and to identify the relationship between the implementation and changes in the social economic conditions of the community.

LITERATURE REVIEW

Community Empowerment in Rural Agriculture

Community empowerment is an important approach in improving rural livelihoods by strengthening community capacity, institutions, and economic opportunities. The agricultural sector plays a critical role in providing income, employment, and food security; however, rural communities often face challenges related to limited technology adoption, dependence on external inputs, and restricted market access (Akzar et al., 2023; Molina et al., 2026). Therefore, empowerment programs need to position communities as active actors through knowledge development, technology adoption, institutional strengthening, and network building (Cajaiba-Santana, 2014; Tjokropandojo et al., 2024).

In agricultural development, program success is not only determined by increased production but also by improvements in community capacity, participation, and the ability to sustain innovation. This perspective highlights the importance of analyzing social and economic changes as interconnected outcomes of empowerment processes.

Agricultural Innovation and Community Transformation

Agricultural innovation contributes to rural transformation by introducing new technologies, improving resource utilization, and creating opportunities for economic development. Social innovation involves the integration of technology, knowledge, institutions, and collective action to address community challenges (Cajaiba-Santana, 2014). Previous studies show that innovation adoption is strongly influenced by farmer groups, social networks, and knowledge-sharing processes that support sustainable agricultural practices (Tjokropandojo et al., 2024).

The integration of agricultural technology with local resource management, production diversification, and market development can strengthen community resilience and improve rural welfare (Arifa & Fahmi, 2025). Therefore, innovation-based empowerment programs require a combination of technological implementation and social capacity building.

Institutional Strengthening and Innovation Adoption

Farmer groups serve as important institutions in facilitating communication, learning, and decision-making in agricultural innovation adoption. Through collective interaction, knowledge can be disseminated and transformed into shared practices within the community (Adawiyah, 2017). Institutional strengthening also supports the sustainability of innovation by ensuring that communities are able to maintain and develop adopted technologies.

The adoption of agricultural innovation depends not only on technological characteristics but also on social conditions, institutional support, and community readiness (Schulz et al., 2023). Thus, strengthening farmer institutions becomes a key mechanism linking innovation implementation with sustainable empowerment outcomes.

Economic Impact through Efficiency and Diversification

Agricultural innovation can improve economic conditions through increased income, production efficiency, and diversification of economic activities. The use of organic fertilizers and biological inputs can reduce dependence on external resources and improve farming efficiency (Darwis, 2014; Hakim et al., 2025). In addition, diversification strategies provide alternative income sources and increase household economic resilience (Wirakusuma, 2020).

Digital marketing and agricultural technology also expand market opportunities for smallholder farmers, although successful implementation requires adequate digital capacity (Satria et al., 2024). These mechanisms demonstrate that economic improvement occurs through the interaction between innovation adoption, resource efficiency, and market access.

Integrated Social and Economic Impact of Empowerment Programs

Social and economic impacts of agricultural empowerment programs are closely interconnected. Increased knowledge supports innovation adoption, strengthened institutions facilitate collective learning, and innovation implementation creates opportunities for efficiency and income improvement

(Tjokropandojo et al., 2024). Social innovation in rural communities therefore depends on the interaction between technology, local actors, institutions, and community networks (O'Shaughnessy et al., 2023).

Based on this framework, the JARI TANGAN Innovation Program represents an integrated empowerment model that combines agricultural innovation, capacity building, institutional strengthening, resource efficiency, and market development. This approach provides a basis for analyzing how innovation-based programs contribute to social and economic improvements among rural communities.

Based on this perspective, this study applies an integrated analytical framework that views empowerment outcomes as a process consisting of innovation implementation, capacity development, institutional strengthening, and economic improvement. This framework guides the analysis of how the JARI TANGAN Innovation Program influences both social and economic conditions among beneficiary communities.

METHODOLOGY

Research Location and Object

The research was conducted in the Indramayu Regency, West Java. This location was selected because it serves as the implementation site for an agricultural innovation-based community empowerment program. The research object is the JARI TANGAN (Kerja Tani Berdikari dan Tahan Pangan) an independent and food-secure farming program implemented by PT Pertamina EP Zona 7 Jatibarang Field, involving community members as program beneficiaries. The analysis focuses on the social and economic changes that occurred following the implementation of the program.

The participants were selected purposively based on their involvement in the JARI TANGAN Innovation Program. The informants consisted of community beneficiaries, farmer group members, community representatives, and stakeholders involved in program implementation. The selection criteria included active participation in program activities and sufficient experience to provide information regarding changes in knowledge, agricultural practices, institutional development, and economic conditions.

Data collection was conducted through semi-structured interviews, field observation, and documentation review. Interviews were conducted to explore participants' experiences regarding innovation adoption, community capacity development, institutional strengthening, and perceived economic benefits after program implementation.

Research Type and Approach

This study employs a descriptive-analytical approach using a case study design (Harrison et al., 2017; Younas & Inayat, 2025). The case study approach was utilized to gain an in-depth understanding of the innovation implementation process and the changes experienced by the beneficiary community. A descriptive approach was used to characterize community conditions and program development based on quantitative and qualitative data. The analytical

approach was used to examine the relationship between innovation implementation and changes in social and economic indicators (Crowe et al., 2011; Harrison et al., 2017; Younas & Inayat, 2025). The study used primary and secondary data. Primary data were obtained through observation and interviews with beneficiaries, community groups, and parties involved in program execution. Secondary data were gathered from program documentation, activity reports, beneficiary records, and supporting documents.

Data analysis was conducted using a descriptive-analytical approach combining qualitative interpretation and comparative analysis. Qualitative data from interviews and observations were analyzed through thematic analysis involving data familiarization, identification of relevant information, coding, categorization, and interpretation of emerging themes. The themes focused on social empowerment processes, including knowledge improvement, participation, institutional strengthening, and innovation adoption.

Quantitative program indicators obtained from documentation were analyzed by comparing conditions before and after program implementation. The analysis examined changes in community knowledge, number of implementing groups, beneficiary coverage, income improvement, and production cost efficiency. The integration of qualitative and quantitative findings enabled a comprehensive understanding of the social and economic impacts generated by the JARI TANGAN Innovation Program.

$$Percentage\ change = \frac{(Value\ after\ program - value\ before\ program)}{Value\ before\ program} \times 100\%$$

RESEARCH RESULT AND DISCUSSION

The JARI TANGAN Program as an Innovation Ecosystem

The JARI TANGAN Program combines several types of agricultural and organizational innovation including Eco Agri Solar, biological agents, organic fertilizers based on local resources, polyculture, group strengthening, farmer regeneration, and digital marketing. This integration supports production efficiency, local resource utilization, and community capacity building. These results are consistent with Cajaiba-Santana (2014), that explained the social innovation develops through collective action and the utilization of knowledge to generate social change.

The application of biological agents and organic fertilizers reduces dependence on external inputs, while polyculture and digital marketing create opportunities for business diversification and market expansion. Strengthening community groups reinforces learning processes and innovation diffusion, as demonstrated by Tjokropandojo et al. (2024), who showed that social networks and farmer groups play a significant role in the diffusion of innovation within Indonesian agricultural communities. The integration of technology, institutions, production, and marketing is also consistent with Arifa and Fahmi (2025), who demonstrated that integrated farming could connect innovation with increased capacity and improved rural community well-being.

Changes in Community Capacity, Knowledge, and Innovation Adoption

Changes in community capacity were reflected in increased knowledge and awareness of organic farming. Table 1 presents the development of community knowledge and organic farming adoption during the 2021–2025 period. This represents an increase of eighty-one individuals, or 67.50%, compared with the initial condition.

Table 1. Development of Community Knowledge and Organic Farming Adoption during the JARI TANGAN Program (2021–2025)

Indicator	2021	2022	2023	2024	2025
Individuals with increased knowledge of organic farming (persons)	120	136	166	176	201
Farmer groups adopting organic farming (groups)	3	4	5	6	7

The increase in knowledge was followed by expanded adoption at the group level. The number of farmer groups adopting organic farming increased from three groups in 2021 to 7 groups in 2025. The addition of four groups, representing an increase of 133.33%, indicates that increased individual capacity began to be translated into collective practices. This result is consistent with Tjokropandojo et al. (2024), who demonstrated that social networks, interactions among actors, and community groups can support innovation diffusion.

This pattern indicates an empowerment process that progresses from increased knowledge toward innovation adoption. Training and mentoring provide communities with knowledge, while farmer groups provide spaces in which this knowledge can be applied, discussed, and further developed. This development indicates that innovation has begun to become embedded in community institutional practices rather than remaining solely at the individual level. This result is supported by Adawiyah (2017), who explained that communication within farmer groups serves as a means of disseminating technological information, discussion, learning, and decision-making in agricultural innovation adoption.

Expansion of Program Reach and Strengthening of Community Social Conditions

Changes in the social conditions associated with the JARI TANGAN Program were further reflected in increased knowledge, growth in implementing groups, and expansion of beneficiary coverage. Table 2 presents a comparison of social indicators between 2021 and 2025.

Table 2. Changes in Social Empowerment Indicators Before and After JARI TANGAN Program Implementation (2021–2025)

Indicator	2021	2025	Changes
Knowledge and awareness of organic farming	120 persons	201 persons	+81 persons (67.5%)
Farmer groups adopting organic farming	3 groups	7 groups	+4 groups (133.3%)
Direct beneficiaries	41 persons	102 persons	+61 persons (148.8%)

Table 2 shows that all social indicators increased during the program period. The number of individuals with knowledge and awareness of organic farming increased by 67.5%, while the number of implementing groups increased by 133.3%. The number of direct beneficiaries also increased from 41 to 102 individuals, representing an increase of 61 individuals (148.8%).

The expansion of beneficiary coverage indicates that the reach of the empowerment process increased alongside improvements in group capacity. This development was also supported by participatory activities such as focus group discussions (FGDs) for work-plan development and *Safari Tani*, which provided spaces for knowledge exchange and interaction among groups. These activities strengthened social relationships and created opportunities for innovative practices to spread to a broader segment of the community. This result is consistent with Tjokropandojo et al. (2024), who demonstrated that social networks, trust, and interactions among actors can support innovation diffusion in Indonesian agricultural communities.

Institutional strengthening was also reflected in the presence of PPAH Sri Trusmi Satu, which functions as a center for biological-agent production, training, and farmer empowerment. The institution supports continuous learning and innovation adoption. Knowledge acquired by community members is not only retained at the individual level but can also be transferred through community groups and local institutions. This condition is consistent with Adawiyah (2017), who explained that farmer groups serve as spaces for communication, discussion, learning, and decision-making in the adoption of agricultural technologies.

These results indicate that the social impacts of JARI TANGAN occur at several levels, including increased individual capacity, strengthened group capacity, and expanded beneficiary coverage. These changes provide a social foundation for the sustainability of agricultural innovation adoption. This result is consistent with O'Shaughnessy et al. (2023), who emphasized the importance of social interaction, local actors, and collective processes in the development of social innovation in rural communities.

The findings indicate that empowerment outcomes emerged through a gradual process rather than a direct effect of technology introduction alone. Knowledge development enabled community members to understand innovation practices, while farmer groups provided institutional support for learning and collective adoption. This process demonstrates that social capacity

and institutional structures function as important mechanisms connecting agricultural innovation with sustainable community empowerment.

Changes in Income and Economic Efficiency

Economic changes among the communities were reflected in increased average farmer group income and reductions in production costs. Table 3 presents the development of average group income during 2021–2025.

Table 3. Development of Average Monthly Income of JARI TANGAN Farmer Groups

Year	Average Monthly Income
2021	Rp 8,021,000
2022	Rp 9,305,000
2023	Rp 11,164,000
2024	Rp 11,900,000
2025	Rp 12,050,000

Average income increased by IDR 4,029,000 per month, or 50.23%, compared with the 2021 baseline. The largest increase occurred between 2022 and 2023, amounting to IDR 1,859,000 per month. This trend indicates that economic changes developed gradually alongside innovation adoption and the strengthening of farming activities.

Data at the individual member level also showed an increasing income pattern. Table 4 presents changes in the income of members of the Mukti Farmer Group before and after participation in the program.

Table 4. Changes in Income among Members of the Mukti Farmer Group

Member	Land area (hectare)	Before program (IDR)	After program (IDR)
Muja	2	8,216,000	11,164,000
Suman	2	8,650,000	11,900,000
Darnoto	2	8,110,000	11,006,000
Anwar	2	8,300,000	11,500,000
Jubaedi	2	8,002,000	10,995,000
Dapi	1,5	6,100,000	7,250,000
Rasmun	1	4,050,000	5,900,000
Bunaim	1	3,400,000	4,250,000
Ino	0,7	2,700,000	3,800,000
Nuradi	0,5	2,450,000	3,650,000
Sunarto	0,5	2,200,000	3,500,000
Suryadi	0,5	2,100,000	3,000,000
Duloh	0,5	1,800,000	2,950,000

Table 4 shows that all recorded members experienced increases in income. Among members cultivating 2 ha of land, income increases ranged from IDR

2,893,000 to IDR 3,250,000 per month. Suman recorded an increase of IDR 3,250,000 per month, from IDR 8,650,000 to IDR 11,900,000. Income increases were also observed among members with smaller landholdings. These changes indicate that the economic benefits of the program were evident in the average group income and individual member level. The adoption of innovations provided opportunities for community members to increase revenue while managing farming costs more efficiently. This result is consistent with Firdaus et al. (2025), who found that organic rice farming in East Java generated higher income than non-organic rice farming and that participation in farmer groups was associated with decisions to adopt organic farming.

Cost efficiency represents an important economic mechanism underlying these changes. The use of organic fertilizer generated average savings of IDR 2,262,000 per hectare, with total savings reaching IDR 72,384,000 across 32 ha of land. These savings indicate that the economic benefits were derived from increased income and reduced expenditures on production input. This result is consistent with Darwis (2014), who found that the application of organic fertilizer in rice farming could reduce the use of chemical fertilizers and generate better financial performance than non-organic systems.

The use of organic fertilizers based on local resources reduces the need for some external inputs and increases the utilization of materials available within the community. The application of biological agents also supports farm management using biological inputs. These conditions form an economic mechanism in which local resource utilization can improve input-use efficiency, reduce production costs, and increase economic benefits for the community. This result is further supported by Hakim et al. (2025), who showed that organic fertilizer use can improve input-use efficiency while reducing production costs through the substitution of chemical inputs.

JARI TANGAN Innovation and Local Economic Value Creation

The economic changes associated with JARI TANGAN also involve changes in the ways communities manage resources and economic activities. The use of organic materials and local resources as production inputs creates connection between production activities and economic efficiency.

The polyculture system provides opportunities for communities to develop more than one commodity, so that sources of income do not depend on a single type of farming activity. Such diversification can increase the flexibility of farming enterprises in responding to changes in prices and production conditions. Consistent with Wirakusuma (2020), who demonstrated that income diversification is one strategy used by farming households to utilize resources and develop sources of income. Strengthening community capacity supports farmers' ability to select and implement production practices according to their farming conditions.

Digital marketing complements this process by expanding access to consumers and markets. Satria et al. (2024) demonstrated that digital agricultural technologies can support efficiency and expand market access for smallholder farmers, although their implementation requires strengthened digital literacy

and community capacity. These changes indicate that JARI TANGAN innovation extends beyond production to include input management, production processes, business diversification, and marketing. This sequence forms a process of economic value creation involving local resources and community capacity.

The results show that increased income cannot be separated from the preceding social changes. Knowledge provides the foundation for innovation adoption, groups provide spaces for learning and coordination, and innovation adoption creates opportunities for efficiency and business diversification. These relationships form an empowerment mechanism that connects social capacity with economic benefits. This study consistent with Tjokropandojo et al. (2024), who showed that social interactions, groups, and local networks play roles in agricultural innovation diffusion in rural Indonesian communities.

Interrelationship between Social and Economic Impacts

The results demonstrate that the social and economic changes associated with the JARI TANGAN Program are interconnected. Increased knowledge provides the foundation for innovation adoption, strengthened groups support knowledge dissemination, and innovation adoption creates opportunities for cost efficiency, business diversification, and increased income. These results are consistent with Tjokropandojo et al. (2024), who demonstrated the role of groups and social capital in agricultural innovation diffusion.

This pathway indicates that economic change is part of a gradual empowerment process. The program provides technologies, develops communities' capacity to apply technologies and manage their benefits. Program data show increases in knowledge of 67.5%, implementing groups of 133.3%, beneficiaries of 148.8%, and average income of 50.23%. These changes reflect developments in social capacity, institutional strengthening, program reach, and economic conditions.

Synthesis of the Impacts of the JARI TANGAN Program

Overall, the JARI TANGAN (Kerja Tani Berdikari dan Tahan Pangan) program demonstrated changes across three main dimensions including social capacity, community institutions, and economic conditions. Increased capacity was reflected in the growing number of individuals with knowledge of organic farming. Institutional strengthening was reflected in the growth of implementing groups and the presence of supporting institutions. Expansion of program reach was reflected in the increasing number of beneficiaries, while the economic impact was reflected in increased income and production cost efficiency.

Table 5. Synthesis of Major Changes Associated with the JARI TANGAN Program

Dimension	Indikator	2021 Condition	2025 Condition	Change
Social capacity	Knowledge of organic farming	120 persons	201 persons	+67,5%

Institutional	Groups adopting organic farming	3 groups	7 groups	+133,3%
Program reach	Direct beneficiaries	41 persons	102 persons	+148,8%
Economy	Average group income	IDR 8,021,000/month	IDR 12,050,000/month	+50,23%
Economic efficiency	Organic fertilizer savings	–	IDR 2,262,000/ha	IDR 72,384,000/32 ha

The synthesis presented in Table 5 shows that program-related changes occurred progressively. Increased knowledge provided the basis for innovation adoption, innovation adoption developed through group institutions, and these practices created opportunities for increased efficiency and income. This sequence demonstrates the relationship between social and economic changes within the empowerment process. The result is consistent with Tjokropandojo et al. (2024), who demonstrated that social networks and farmer groups can support innovation diffusion in Indonesian agricultural communities.

These results indicate that JARI TANGAN does not merely generate changes in agricultural technical practices. The program also strengthens communities' ability to learn, work collectively, utilize local resources, develop economic activities, and obtain economic benefits. JARI TANGAN can therefore be understood as an empowerment process that integrates technological innovation, capacity building, institutional strengthening, business efficiency, and local economic value creation. This result is consistent with Arifa and Fahmi (2025), who demonstrated that innovation in integrated agricultural systems needs to be supported by market access, education, and social support to provide broader benefits to rural communities.

Substantively, the results demonstrate that the success of community-based agricultural innovation is determined by the technologies introduced and by communities' ability to understand, adopt, develop, and sustain those innovations. The integration of technological and social dimensions represents a key characteristic of JARI TANGAN in promoting changes in the conditions of beneficiary communities. These results reinforce Tjokropandojo et al. (2024), who demonstrated that networks, groups, and social mechanisms play roles in the diffusion of agricultural innovations, although continued strengthening of institutional capacity remains necessary for innovations to develop sustainably.

This study has several limitations that should be considered when interpreting the findings. First, this research employed a case study approach focusing on the JARI TANGAN Innovation Program in Indramayu Regency. Therefore, the findings reflect the specific socio-economic context of the

beneficiary communities and may not be directly generalized to other agricultural empowerment programs with different characteristics.

Second, the analysis of social and economic impacts was based on program documentation, field observations, and information obtained from community participants involved in the program. Although multiple sources of data were used to strengthen the analysis, the findings may still reflect contextual conditions during the program implementation period.

Third, this study primarily examined changes in community capacity, institutional strengthening, beneficiary expansion, income improvement, and production efficiency. Future research may further investigate the long-term sustainability of innovation adoption, environmental impacts, and comparative outcomes across different community empowerment programs.

CONCLUSIONS AND RECOMMENDATIONS

The JARI TANGAN (Kerja Tani Berdikari dan Tahan Pangan) Innovation Program was associated with improvements in the social and economic conditions of beneficiary communities through increased capacity, expanded innovation adoption, institutional strengthening, and increased income. The number of individuals with knowledge of organic farming increased from 120 to 201, the number of implementing groups increased from 3 to 7, and the number of beneficiaries increased from 41 to 102. Average community income also increased from IDR 8.021 million to IDR 12.050 million per month, representing an increase of approximately 50.23%. These results indicate that the integration of agricultural innovation, capacity building, business diversification, institutional development, and market access can support community empowerment and sustainable improvements in community well-being.

Future implementation of the JARI TANGAN program should focus on strengthening farmer institutions, expanding continuous training and mentoring, and improving innovation sustainability through wider adoption of environmentally friendly agricultural practices. Further development of digital marketing capacity, market networks, and business diversification is recommended to enhance economic resilience and increase the long-term benefits for community members. In addition, future studies are encouraged to examine the long-term sustainability of the program and explore broader social, environmental, and economic outcomes of agricultural innovation-based empowerment models.

The contribution of this study lies in demonstrating that community empowerment through agricultural innovation involves interconnected processes of capacity building, institutional strengthening, and economic value creation. The JARI TANGAN Program illustrates that sustainable empowerment requires not only technological intervention but also continuous knowledge development, community participation, and institutional support.

ADVANCED RESEARCH

Future research should explore the long-term sustainability of agricultural innovation-based empowerment programs by examining changes in social

resilience, environmental sustainability, and economic independence of beneficiary communities. Further studies may also develop a comprehensive impact evaluation framework that integrates institutional capacity, innovation adoption, digital market development, and livelihood improvement to better understand the mechanisms underlying community empowerment outcomes.

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