

# ANALYSIS OF THE IMPLEMENTATION OF APPROPRIATE TECHNOLOGY TO SUPPORT COMMUNITY BUSINESS PRODUCTIVITY IN SIMPANG AGUNG VILLAGE, SEPUTIH AGUNG DISTRICT, CENTRAL LAMPUNG REGENCY

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## Abstract:

The research method used is descriptive qualitative research. This method is used to describe the analysis of the application of appropriate technology to support community business productivity in Seputih Agung Village, Seputih Agung District, Central Lampung Regency. All data were obtained directly from informants in the field using interviews and document studies. The research results show that (1) the implementation of Appropriate Technology in Simpang Agung Village, Seputih Agung District, Central Lampung Regency, according to the dimensions of (a) Compatibility, (b) Ease of Use (Simplicity/Complexity), (c) Efficiency and Productivity, (d) Affordability/ Accessibility, (e) Sustainability, and (f) Empowerment, has generally made a positive contribution to supporting community business productivity. The use of TTG can help business actors improve work efficiency, accelerate production processes, and improve product yields and quality compared to traditional methods. Furthermore, appropriate technology also plays a role in encouraging business independence, improving community skills, and opening up opportunities for increasing income based on local potential. (2) Aspects inhibiting the effectiveness of appropriate technology implementation have not been fully optimized because several obstacles still affect the sustainability and expansion of its use. These obstacles relate to the suitability of the technology to local needs, limited technical capabilities of users, affordability, and minimal ongoing mentoring.

**Keywords:** Implementation, Technology, Accuracy, Usefulness, Productivity

## INTRODUCTION

The application of Appropriate Technology, locally known as *Teknologi Tepat Guna* (TTG), has become an important strategy in rural development, particularly in strengthening community productivity, local economic independence, and village-based entrepreneurship. TTG is not merely understood as the use of simple tools or machines, but as a form of technology that is suitable for local needs, easy to operate, affordable, environmentally sound, and capable of generating economic value for rural communities. In the Indonesian regulatory context, TTG is defined as technology that responds to community needs, solves local problems, is environmentally friendly, easy to utilize and maintain, and produces added value from both economic and environmental aspects.

The relevance of TTG in rural development is closely related to the idea of human-centered technology. Schumacher, through the concept of intermediate



technology, argues that development in rural areas should not depend solely on large-scale, capital-intensive technology, but should prioritize technology that is simple, affordable, small-scale, and compatible with local labor and resources. This perspective is important because rural communities often face limited capital, limited technical skills, and restricted access to modern production facilities. Therefore, TTG becomes an alternative development instrument that bridges traditional production methods and modern industrial technology.

In practice, TTG has the main objective of helping rural communities improve productive enterprises, accelerate production processes, reduce operational costs, and increase the added value of local products. The Ministry of Villages has emphasized that TTG can support rural economic independence by improving the quality and quantity of village production. TTG is also not limited to machines, but may include production processes or product innovations that create economic and environmental value. Thus, TTG is relevant for agricultural processing, post-harvest management, livestock production, food processing, micro-enterprises, and other local economic activities.

Theoretically, the implementation of TTG can be understood through the lens of innovation diffusion. Rogers explains that the adoption of innovation is influenced by several characteristics, including relative advantage, compatibility, complexity, trialability, and observability. In the context of TTG, a technology is more likely to be adopted when the community perceives it as beneficial, compatible with local habits, easy to understand, possible to test, and visibly useful for increasing productivity. Therefore, the success of TTG implementation depends not only on the availability of tools, but also on the community's readiness to accept, operate, maintain, and develop the technology.

Human resources are also a decisive factor in TTG implementation. Technology will not generate optimal benefits if users do not have sufficient knowledge, skills, and confidence to operate it. In this regard, TTG implementation is closely related to community empowerment. Chambers emphasizes that rural development should place local communities as active subjects rather than passive recipients of development programs. This means that TTG programs should involve the community in identifying needs, selecting technology, receiving training, maintaining equipment, and developing productive enterprises based on local potential.

In Simpang Agung Village, Seputih Agung District, Central Lampung Regency, initial observations indicate that several community groups have begun using TTG to support productive activities. For example, agricultural processing groups have used milling and drying machines to accelerate post-harvest processing, while livestock farmers have used grass choppers to prepare animal feed more efficiently. These forms of TTG have helped reduce manual labor, shorten production time, and increase output capacity. However, the implementation of TTG has not been evenly distributed among community members. Some business actors have adopted simple machines, while others

still rely on traditional methods due to limited technical skills, lack of capital, and insufficient continuous mentoring.

The empirical condition in Simpang Agung Village shows that TTG implementation is still uneven. Based on preliminary field observations, the main patterns can be summarized as follows:

<b>Aspect Observed</b>	<b>Initial Field Indication</b>
Type of TTG used	Milling machines, drying machines, grass choppers, and simple production tools
Main users	Agricultural groups, livestock farmers, and small household-based enterprises
Main benefit	Faster production process, reduced manual labor, and increased production efficiency
Main obstacle	Limited technical skills, lack of maintenance knowledge, and limited operational capital
Institutional support	Training and mentoring are available but not yet continuous
Coordination	Collaboration between village government, community groups, and related institutions is still limited

These preliminary data indicate that TTG has the potential to support community business productivity, but its impact depends on the quality of implementation, user capacity, institutional support, and sustainability of assistance. This is consistent with the principle of community-driven development, which emphasizes that communities should be empowered to participate in planning, decision-making, fund management, and project implementation.

Socially, TTG implementation also contributes to community empowerment. Through training, mentoring, and the use of production technology, community members can improve creativity, independence, work efficiency, and responsibility in managing local resources. TTG can also encourage collective learning among community groups. However, empowerment will only be sustainable if the implementation process is participatory, locally relevant, and supported by institutions. In Indonesia, TTG management is also directed toward increasing economic enterprises, developing entrepreneurship, providing sustainable benefits, and applying simple technologies through participatory and locally based principles.

Despite its potential, the implementation of TTG in rural areas often faces several structural and managerial constraints. These include unequal access to technology, limited knowledge and technical skills, lack of equipment maintenance, insufficient capital, weak institutional coordination, and limited use of local natural resources. In Simpang Agung Village, these constraints have affected the ability of community business actors to adopt and optimize TTG. As a result, the productivity gains achieved by some groups have not yet been replicated widely across the village community.

Based on this condition, a comprehensive study is needed to analyze the implementation of TTG in supporting community business productivity in Simpang Agung Village. This study is important because it does not only examine the availability of technology, but also analyzes how TTG is understood, adopted, utilized, maintained, and developed by the community. In line with the descriptive qualitative research approach, the study focuses on understanding processes, experiences, supporting factors, and inhibiting factors in TTG implementation rather than measuring productivity solely through numerical indicators.

Therefore, this research is expected to provide both theoretical and practical contributions. Theoretically, it enriches the discussion on appropriate technology, innovation adoption, and community empowerment in rural development. Practically, it provides recommendations for village government, community empowerment institutions, and local business actors in improving TTG utilization, strengthening training and mentoring, expanding access to production facilities, and optimizing local resources to increase community business productivity.

#### **Identification of Problems**

Based on the background and preliminary observations in Simpang Agung Village, several problems can be identified:

1. The level of TTG utilization varies among community business actors. Some groups have used simple tools and machines, while others still depend on traditional production methods.
2. Community knowledge and technical skills in operating and maintaining TTG remain limited.
3. Training and mentoring from the government or related institutions have not been implemented continuously.
4. Limited capital and access to production facilities make it difficult for community members to adopt more efficient technology.
5. Coordination among village government, community empowerment institutions, and local business actors remains suboptimal.
6. Local potential and natural resources have not been fully processed into higher-value products through TTG.
7. The sustainability of TTG utilization is still constrained by maintenance problems, operational costs, and limited institutional support.

#### **Research Questions**

Based on the problems above, the research questions are formulated as follows:

1. How is Appropriate Technology implemented in supporting community business productivity in Simpang Agung Village, Seputih Agung District, Central Lampung Regency?
2. What are the supporting and inhibiting factors in the implementation of Appropriate Technology to support community business productivity in Simpang Agung Village, Seputih Agung District, Central Lampung Regency?

## **RESEARCH METHOD**

This study employs a descriptive qualitative research method to analyze the implementation of Appropriate Technology (*Teknologi Tepat Guna* or TTG) in supporting community business productivity in Simpang Agung Village, Seputih Agung District, Central Lampung Regency. The descriptive qualitative approach was chosen because this study seeks to understand the actual conditions, processes, experiences, and meanings related to the use of TTG in community economic activities. Rather than measuring the phenomenon statistically, this approach enables the researcher to explore how appropriate technology is introduced, adopted, utilized, maintained, and developed by local communities in their daily productive activities.

According to Creswell and Poth (2018), qualitative research is appropriate when researchers aim to understand a social phenomenon based on the perspectives, experiences, and interpretations of participants. In this context, the implementation of TTG is not only viewed as the use of tools or machines, but also as a social process involving adaptation, learning, participation, and empowerment. Therefore, the qualitative approach is relevant because it allows the researcher to examine the interaction between technology, community capacity, local resources, and institutional support.

The descriptive design is used to provide a systematic and contextual explanation of TTG implementation in the village. As stated by Sandelowski (2000), qualitative descriptive research is suitable for studies that aim to present a comprehensive summary of events or phenomena in everyday terms. This means that the study does not attempt to manipulate variables or test causal relationships, but rather describes the real condition of TTG utilization as experienced by farmers, livestock groups, MSME actors, and village stakeholders. Through this design, the research can capture the practical realities of technology use, including its benefits, limitations, and sustainability challenges.

The research was conducted in Simpang Agung Village, Seputih Agung District, Central Lampung Regency. This location was selected because the village has several community groups that have begun to utilize TTG in productive sectors, particularly agriculture, livestock, and small-scale enterprises. These include farmers who use post-harvest processing tools, livestock farmers who use grass choppers for animal feed preparation, and micro or small business actors who use simple production equipment to improve work efficiency. The selection of this location is based on its relevance to the research objective, namely to examine how TTG supports community business productivity and what factors influence its implementation.

Data collection was carried out over several months to obtain a more comprehensive understanding of the implementation process. This research period enabled the researcher to observe the use of TTG in different situations, interact directly with informants, and identify practical challenges faced by users in operating and maintaining the technology. Prolonged engagement in the field is important in qualitative research because it helps researchers build

trust with participants and understand the context more deeply. Lincoln and Guba (1985) argue that prolonged engagement and persistent observation are essential strategies for increasing the credibility of qualitative findings.

The data in this study were collected through observation, in-depth interviews, and documentation. Observation was conducted by directly examining the use of TTG tools and machines among farmers, livestock groups, and small business actors. The observation focused on how the technology was operated, how it affected work efficiency, how users maintained the equipment, and how far the technology contributed to production improvement. According to Patton (2015), observation enables researchers to understand behavior, processes, and interactions in their natural setting. Therefore, observation was important in this study because TTG implementation could not be fully understood only through verbal explanations from informants.

In-depth interviews were conducted with various stakeholders who were directly or indirectly involved in TTG implementation. The informants included village government officials, TTG recipients and users, members of farmer groups, livestock groups, MSME actors, training facilitators, extension workers, and local community empowerment officials. The interviews explored several important aspects, such as the introduction of TTG, community readiness, user skills, perceived benefits, adaptation challenges, maintenance practices, institutional support, and the sustainability of TTG utilization. Kvale and Brinkmann (2009) explain that qualitative interviews are useful for understanding people's lived experiences and the meanings they attach to certain phenomena. In this study, interviews provided deeper insight into how community members perceive and experience TTG in their productive activities.

Documentation was also used to support and strengthen the data obtained through observation and interviews. The documents analyzed included village profiles, training reports, photographs of TTG utilization, records of TTG distribution, activity reports, and production data from community business groups where available. Documentation served as complementary evidence to verify field findings and provide a broader institutional context regarding TTG programs in Simpang Agung Village. Bowen (2009) states that document analysis is useful in qualitative research because documents can provide background information, historical context, and additional evidence to support findings from other sources.

The data analysis technique used in this study refers to the interactive model developed by Miles, Huberman, and Saldaña (2014), which consists of data condensation, data display, and conclusion drawing or verification. Data condensation was conducted by selecting, simplifying, organizing, and focusing information obtained from observations, interviews, and documentation. In this stage, data related to TTG implementation, productivity improvement, supporting factors, and inhibiting factors were identified and categorized according to the research focus.

The next stage was data display. The reduced data were presented in the

form of descriptive narratives, thematic categories, and analytical patterns. This stage helped the researcher identify relationships between TTG utilization, community capacity, institutional support, maintenance practices, and business productivity. Miles, Huberman, and Saldaña (2014) emphasize that data display is important because it helps researchers organize information systematically and draw meaningful interpretations from qualitative data.

The final stage was conclusion drawing and verification. Conclusions were developed gradually throughout the research process by comparing data from different sources and techniques. Verification was carried out continuously to ensure that the conclusions were based on consistent, credible, and relevant findings. In qualitative research, conclusions are not drawn only at the end of the study, but are refined throughout the process as new data emerge and patterns become clearer.

To ensure the credibility and validity of the findings, this study applied triangulation. Source triangulation was conducted by comparing information obtained from different informants, such as village officials, TTG users, community groups, extension workers, and facilitators. Technique triangulation was carried out by comparing data from observation, interviews, and documentation. Time triangulation was also applied by conducting repeated observations at different times to obtain more stable and reliable information. Denzin (1978) explains that triangulation strengthens research validity by using multiple sources, methods, or perspectives to examine the same phenomenon. Therefore, triangulation in this study was used to minimize bias and strengthen the accuracy of findings.

Overall, this research method was designed to provide a valid, comprehensive, and contextual explanation of TTG implementation in Simpang Agung Village. The qualitative descriptive approach enables the study to explain not only the technical use of appropriate technology, but also the social, institutional, and economic factors that influence its effectiveness. Through observation, interviews, documentation, interactive data analysis, and triangulation, this study is expected to produce findings that can contribute to the development of TTG-based community empowerment and the improvement of village business productivity.

## **FINDINGS AND DISCUSSION**

The findings of this study describe the actual condition of Appropriate Technology (*Teknologi Tepat Guna* or TTG) implementation in Simpang Agung Village, Seputih Agung District, Central Lampung Regency. Based on field observations, in-depth interviews, and documentation, the implementation of TTG can be understood through six main analytical dimensions: compatibility with community needs, simplicity and complexity of technology, efficiency and productivity impact, affordability and accessibility, sustainability of implementation, and community empowerment. These dimensions show that TTG is not merely a technical instrument, but also part of a broader process of rural innovation, community capacity development, and local economic

empowerment.

### **Compatibility of Appropriate Technology with Community Needs**

The findings indicate that the TTG introduced in Simpang Agung Village is generally compatible with the basic needs of community business actors. In the agricultural sector, tools such as milling machines, drying equipment, and water pumps are relevant to the village's agricultural characteristics because they support post-harvest processing, water management, and production efficiency. In the livestock sector, grass choppers and feed mixers help farmers process animal feed more quickly and in larger quantities. These technologies respond directly to practical problems faced by the community in their daily productive activities.

This finding is in line with Rogers' theory of innovation diffusion, which states that one of the key factors influencing technology adoption is **compatibility**, namely the degree to which an innovation is perceived as consistent with users' values, needs, experiences, and socio-economic conditions (Rogers, 2003). In the context of Simpang Agung Village, TTG is more easily accepted when the technology is considered relevant to existing livelihoods, such as agriculture, livestock, and small-scale enterprises.

However, compatibility is not evenly experienced by all users. Some community members still perceive certain technologies as less suitable because of differences in business scale, limited technical skills, or the inability to adapt the equipment to their production routines. This shows that technology suitability should not only be assessed from the type of tool provided, but also from the readiness of users, local production patterns, and the socio-economic capacity of community groups.

### **Simplicity and Complexity of Technology**

Most TTG tools used in Simpang Agung Village are designed to be relatively simple, practical, and easy to operate. Farmers, livestock breeders, and MSME actors generally appreciate technologies that do not require advanced technical knowledge. This simplicity makes TTG more acceptable among rural communities because users can operate the equipment after basic training or direct demonstration.

This condition is consistent with Schumacher's concept of appropriate or intermediate technology. Schumacher (1973) argues that technology for rural development should be simple, affordable, labor-friendly, and suitable for local conditions. In this sense, TTG should not create dependency on highly complex systems, but should enable communities to improve productivity using technology that they can understand, operate, and maintain.

Nevertheless, the findings also reveal that complexity often appears at the maintenance and troubleshooting stages. Some users are able to operate the machines, but they face difficulties when the equipment requires regular maintenance, spare-part replacement, or technical repair. In several cases, users depend on external technicians because they do not yet have sufficient skills to identify and solve technical problems independently.

This finding supports Rogers' view that **complexity** influences the rate of

innovation adoption. The more difficult a technology is perceived to be, the slower the adoption process tends to be (Rogers, 2003). Therefore, the simplicity of TTG should not only be measured from ease of operation, but also from ease of maintenance, availability of spare parts, and the ability of users to solve minor technical problems.

### **Efficiency and Productivity Impact**

The implementation of TTG has contributed positively to production efficiency and community business productivity. Informants reported that the use of TTG helps accelerate production processes, reduce manual labor, increase output capacity, and improve product consistency. For example, milling machines help reduce post-harvest processing time, while grass choppers enable livestock farmers to prepare animal feed faster and in larger quantities. Drying equipment also supports better product quality by reducing dependence on traditional drying methods.

From a productivity perspective, these findings show that TTG provides a **relative advantage** for users. Rogers (2003) explains that an innovation is more likely to be adopted when users perceive clear benefits compared to previous practices. In Simpang Agung Village, the relative advantage of TTG can be seen in shorter production time, reduced physical workload, higher output, and more consistent product quality.

The impact of TTG is also related to the concept of productivity improvement in community-based enterprises. According to Chambers (1983), rural development should strengthen the capacity of local communities to manage their own resources and improve their livelihoods. TTG contributes to this process by enabling communities to transform local resources into more valuable products through more efficient production methods.

However, the productivity impact is not equally experienced by all users. Groups that use the technology regularly and receive adequate training tend to gain greater benefits. Conversely, users with limited operational skills or irregular access to equipment experience lower productivity improvement. This indicates that TTG effectiveness depends not only on equipment availability, but also on user competence, frequency of use, and institutional support.

### **Affordability and Accessibility**

Although TTG provides significant benefits, affordability remains a major challenge for small-scale farmers, livestock breeders, and MSME actors. Many users consider TTG tools relatively expensive, especially when they must purchase them independently. Limited capital makes it difficult for individual business actors to adopt more efficient production technologies, even when they recognize the potential benefits.

This finding is consistent with the principle of appropriate technology proposed by Schumacher (1973), who emphasizes that technology for rural communities should be economically accessible and suitable for local financial capacity. When technology is too expensive, its benefits may only be enjoyed by certain groups, while poorer or smaller-scale producers remain dependent on traditional methods.

In Simpang Agung Village, access to TTG is often made possible through village government assistance, empowerment programs, or collective ownership by community groups. Group-based access helps reduce individual financial burdens because equipment can be used collectively. However, this mechanism also requires clear management rules regarding usage schedules, maintenance responsibilities, operational costs, and benefit sharing.

Operational costs also influence accessibility. Fuel, electricity, spare parts, and repair costs may limit the continuous use of TTG. Therefore, affordability should not only be understood as the ability to obtain equipment, but also as the ability to operate, maintain, and sustain the use of technology over time.

### **Sustainability of TTG Implementation**

The sustainability of TTG implementation in Simpang Agung Village is influenced by user skills, maintenance awareness, group management, and institutional support. Several community groups are able to maintain the technology properly because they have clear responsibilities, regular usage patterns, and a shared commitment to equipment maintenance. In these cases, TTG continues to function and provides long-term benefits for productive activities.

However, some tools are not optimally used or become idle due to limited maintenance knowledge, damaged components, lack of spare parts, or weak group organization. This indicates that the sustainability of TTG cannot be achieved only through equipment distribution. It requires continuous assistance, periodic training, technical support, and monitoring from village government or related institutions.

This finding is in line with Chambers' participatory development perspective. Chambers (1983) argues that development programs are more sustainable when communities are actively involved in planning, implementing, managing, and evaluating the program. Therefore, TTG sustainability requires community ownership, not merely program delivery from government or external institutions.

Institutional support is also crucial. Village government, technical agencies, extension workers, and community empowerment institutions need to collaborate to ensure that TTG remains functional and relevant to local economic needs. Without institutional continuity, TTG may only provide temporary benefits and fail to become a sustainable instrument for improving community business productivity.

### **Community Empowerment and Skill Improvement**

The findings show that TTG implementation contributes significantly to community empowerment. Through training, mentoring, and direct use of technology, community members gain new knowledge, technical skills, and confidence in managing productive activities. Farmers and livestock breeders become more efficient in processing agricultural and livestock products, while MSME actors are encouraged to improve product quality, packaging, and market readiness.

This finding reflects the view of Chambers (1983), who emphasizes that

rural development should position communities as active subjects rather than passive recipients of development assistance. In this study, TTG becomes an empowerment instrument when community members are involved in learning, operating, maintaining, and developing technology according to their needs.

The empowerment impact is also visible among women’s groups and youth groups, particularly in food processing and creative economic activities. TTG helps them participate more actively in productive enterprises and strengthens their role in the village economy. However, empowerment has not been evenly distributed because training and mentoring have not reached all potential users. Some community members remain outside the TTG program due to limited access, lack of information, or low readiness to adopt technology.

Therefore, TTG-based empowerment needs to be expanded through inclusive training, wider access to tools, continuous mentoring, and stronger collaboration among stakeholders. Empowerment should not stop at introducing technology, but must continue until the community is capable of using, maintaining, and developing the technology independently.

**Synthesis of Findings**

Overall, the implementation of Appropriate Technology in Simpang Agung Village has contributed positively to community business productivity. TTG has helped accelerate production processes, reduce manual labor, improve product quality, and increase community capacity in managing local economic activities. The benefits are particularly visible in agriculture, livestock, and small-scale enterprises.

However, the findings also show that the success of TTG implementation is influenced by several factors, including technology suitability, user competence, affordability, access to facilities, maintenance capacity, group management, and institutional support. In line with Rogers’ theory of innovation diffusion, TTG adoption is stronger when the technology offers clear benefits, matches community needs, is easy to use, and can be observed in its practical results. Meanwhile, Schumacher’s concept of appropriate technology emphasizes that rural technology must be simple, affordable, and relevant to local conditions. Chambers’ empowerment perspective further explains that TTG will be sustainable when communities are actively involved and have ownership over the development process.

Thus, TTG should not be viewed merely as a set of tools or machines. It should be understood as part of a broader rural development strategy that combines technology, community participation, institutional support, and local economic empowerment. For Simpang Agung Village, strengthening TTG implementation requires continuous training, better maintenance systems, stronger group management, wider access to capital and equipment, and more effective collaboration between village government, technical institutions, and community business actors.

**Summary Table of Findings and Theoretical Interpretation**

Analytical Dimension	Main Empirical	Expert Perspective	Interpretation
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	<b>Finding</b>		
Compatibility	TTG generally matches agriculture, livestock, and MSME needs	Rogers: innovation adoption depends on compatibility with user needs and conditions	TTG is more easily accepted when it fits local livelihoods
Simplicity/Complexity	Tools are easy to operate but maintenance remains difficult	Schumacher: appropriate technology should be simple and locally manageable	Training must include maintenance and troubleshooting
Efficiency and Productivity	TTG reduces manual labor, accelerates work, and increases output	Rogers: relative advantage encourages adoption	Productivity improves when users clearly experience benefits
Affordability/Accessibility	Cost remains a barrier for small users	Schumacher: technology must be economically accessible	Group-based ownership and government support are needed
Sustainability	Some tools are maintained, while others become idle	Chambers: participation and local ownership support sustainability	TTG requires continuous mentoring and institutional support
Empowerment	TTG improves skills, confidence, and independence	Chambers: communities must be active subjects of development	TTG functions as an empowerment instrument, not only a production tool

## CONCLUSION

This study concludes that the implementation of Appropriate Technology (*Teknologi Tepat Guna* or TTG) in Simpang Agung Village has contributed positively to improving community business productivity. Through a descriptive qualitative approach, the study found that TTG is not only used as a

technical instrument, but also functions as a medium for community empowerment, skill improvement, and local economic development. The use of milling machines, drying equipment, water pumps, grass choppers, and other simple production tools has helped community groups accelerate production processes, reduce manual labor, improve product quality, and increase work efficiency.

The findings show that TTG implementation is generally compatible with the needs of the community, especially in the agricultural, livestock, and small-scale enterprise sectors. However, its effectiveness varies depending on users' technical skills, business scale, access to capital, and the availability of institutional support. Although most TTG tools are relatively simple to operate, problems still occur in maintenance, troubleshooting, spare-part availability, and operational costs. These obstacles indicate that the provision of technology alone is not sufficient without continuous training, mentoring, and technical assistance.

This study also found that TTG has an important role in strengthening community empowerment. Through the use of technology, community members become more independent, innovative, and confident in managing productive activities. Nevertheless, empowerment has not been evenly distributed because access to training, tools, and mentoring remains limited for some groups. Therefore, stronger collaboration among village government, technical institutions, extension workers, and community business groups is needed to ensure that TTG can be used sustainably and inclusively.

Overall, the success of TTG implementation in Simpang Agung Village is influenced by several key factors, namely the suitability of technology with local needs, ease of use, affordability, maintenance capacity, user competence, group management, and institutional support. Based on the qualitative method used in this study, the implementation of TTG should be understood as a process involving adoption, adaptation, utilization, and sustainability within community economic activities.

Therefore, future TTG development programs should not only focus on distributing tools or machines, but also on strengthening human resource capacity, providing continuous assistance, improving access to capital, developing maintenance systems, and optimizing local potential. These efforts are expected to make TTG a sustainable strategy for increasing productivity, strengthening village-based enterprises, and improving the welfare of rural communities.

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