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MORALITY BEFORE KNOWLEDGE

From tradition to modernity: The role of smart villages in reshaping agricultural communities and sustainable development

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ABSTRACT

Background: Improving the welfare of farmers in rural areas can be done through various methods, one of which is Smart Village. The Smart Village concept has been introduced as an initiative that integrates advanced technology and sustainable agricultural practices. This research aims to evaluate the impact of implementing the Smart Village concept on changes in farmer welfare. **Methods:** This research used literature reviews approach to collect and analyze data from various previous studies related to the implementation of Smart Villages and their impact on farmer welfare. **Findings:** The analysis results show that Smart Village contributes significantly to increasing agricultural productivity through the use of smart agricultural technology, such as automatic irrigation systems and the use of big data for weather predictions and soil analysis. In addition, better access to markets and price information has helped farmers increase their bargaining power, which has a direct positive effect on their income. However, the study also points to challenges, including the need for adequate technological training for farmers and large initial investments. **Conclusion:** The Smart Village concept, through the integration of technology and smart agricultural practices, has proven effective in encouraging changes in the welfare of farmers in rural areas. To maximize its benefits, ongoing support from government and the private sector is needed in the form of training, funding and infrastructure. **Novelty/Originality of this article:** This study bridges the gap between modern technology and traditional agriculture, exploring how the Smart Village concept can revolutionize rural life. This study opens new avenues for inclusive and competitive rural development by combining digital innovation and sustainable agricultural practices.

KEYWORDS : empowerment, government village, rural, smart farming, technology

1. Introduction

The change from traditional structures to modernity in rural communities is a global phenomenon that reflects broad socio-economic transitions. Once isolated rural communities are increasingly exposed to global influences and urbanization, which often leads to depopulation, population aging, and limited access to essential services. Increasing rural to urban migration demands sustainable and innovative solutions to improve the quality of life in rural areas. In this context, Information and Communication technology plays an important role in not only changing infrastructure but also the way people live. The existence of technology is changing people's lifestyles in daily life, both in terms of social interactions, business, education, and so on. One technology that continues to develop is the

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internet. The presence of the Internet has supported the effectiveness and efficiency of company/agency operations, especially its role as a means of communication, publication, and a means of obtaining various required information (Asriani, 2011).

Current technological developments mean that distance between people is not limited by place and time. Technology makes every human being closer. Technology in urban society is no longer strange, because cities are dominated by modern society which cannot be separated from technology. Several studies have found that the application of smart cities closely with technology shows statistically significant results on quality, satisfaction and reliability (Herdiansyah, 2023). In contrast to rural communities, the spread of technology is not as easy as in urban communities. However, access to rural communities is getting closer with technology . The entry of this technology forms a new paradigm in society so that people are more skilled in implementing technology. Digital technology used productively in rural communities can help alleviate poverty and improve people's standard of living (Adera et al., 2014; Philip et al., 2017). Despite the potential benefits, implementing smart village initiatives faces several constraints, including limited infrastructure, low digital literacy among villagers, financial barriers, and resistance to change due to traditional practices. Addressing these challenges requires a comprehensive approach that includes capacity building, financial support, and community engagement to ensure the successful adoption of smart village technologies.

The concept of rural governance is the main intervention in implementing internet technology into villages. Smart villages are a new rural paradigm in Indonesia in implementing its government with the aim of improving the welfare of the community, especially farmers. Farmers, as the core of rural communities, often face difficulties in accessing markets, resources and technology, which affects their bargaining position in the market economy. Current issues in rural areas include inadequate infrastructure, limited access to quality education and healthcare, and low agricultural productivity. Many farmers still rely on traditional farming methods, leading to lower crop yields and reduced income. Additionally, limited access to the internet highlights the digital divide that hinders the implementation of smart village concepts. Smart villages are proposed as a solution that integrates technology to improve farmers' welfare by strengthening their bargaining position in production and distribution aspects (Pérez-delHoyo & Mora, 2019). A smart village is a village that innovatively uses information technology to improve the quality of life, efficiency and competitiveness in economic, social and environmental aspects, which in its implementation is not only able to apply the use of information and communication technology, but also develops the village's potential in various fields, increasing economy, and improving the quality of life of village communities based on information and communication technology (BBLM Yogyakarta, 2020).

The new paradigm of implementing smart villages in Indonesia will encourage changes in traditional society towards a modern one. The push for change will continue to increase from time to time as the era of disruption continues to hit. Various social changes in society will be answered by human awareness in adapting from time to time . This smart village is considered as one solution to stem the flow of migration to cities that are already congested and unsustainable, offering a development model that can be combined with local wisdom and environmental sustainability. Scientific studies have identified various strategies and challenges in implementing smart villages, including aspects of energy, health, transportation, education, and smart water sources, all of which contribute to improving the quality of life in rural areas (Pérez-delHoyo & Mora, 2019); (Renukappa et al., 2022). Case studies in various countries, such as India and China, show that building smart villages can significantly reduce rural to urban migration, revive local economies, and increase access to education and health services (Zhang & Zhang, 2020). This approach not only provides better infrastructure but also empowers communities by strengthening local capacity through education and community participation in planning and managing village resources. This research is grounded in the theory of digital divide, which examines the gap between those who have access to modern information and communication technology and those who do not. The diffusion of innovation theory, which explores how new ideas and

technologies spread within a community, is also pertinent to understanding how smart village initiatives can be effectively introduced and adopted in rural areas. Furthermore, the theory of rural development provides a framework for analyzing the socio-economic transformations required to enhance the welfare of rural communities. Smart villages also seek to integrate technological solutions to address the specific needs of rural communities, thereby creating new opportunities for inclusive and sustainable growth and development (Zhang & Zhang, 2020). Prior studies, such as those by Adera et al. (2014) and Philip et al. (2017), have shown that digital technology can significantly alleviate poverty and improve living standards in rural communities. Additionally, research by Pérez-delHoyo & Mora (2019) and Renukappa et al. (2022) highlights the effectiveness of smart village initiatives in enhancing infrastructure, education, and healthcare services in rural areas. Case studies from India and China (Zhang & Zhang, 2020) demonstrate that implementing smart villages can reduce rural-to-urban migration and revive local economies. These studies provide a strong foundation for understanding the potential impact of smart villages on rural development and the welfare of farmers. One of the main gaps that needs to be bridged is the lack of deep understanding of how best to implement and adapt technology in highly varied rural contexts. In addition, there needs to be a study of the long-term effects of smart villages on rural social and economic dynamics, especially in the context of empowering farmers and strengthening their bargaining position.

Smart villages are not just the application of technology, but are an ecosystem that supports social innovation, digitalization and community empowerment. However, studies on the implementation and effectiveness of smart villages in the specific context of farmer welfare are still limited. There is a need to explore how this concept can be adapted to meet the specific needs of farmers and rural communities in diverse contexts (Renukappa et al., 2022). Smart villages have the potential to facilitate social change by increasing access to information, markets and technology. However, it is necessary to study further how these social changes specifically affect the bargaining position of farmers in rural areas. Often, despite improvements in infrastructure and access to technology, gaps in knowledge and skills can prevent farmers from fully exploiting the potential offered by smart villages (Zhang & Zhang, 2020).

Based on the background that has been described, it is important to carry out research to find solutions to problems that exist in rural communities, namely improving the welfare of village communities and strengthening farmers' bargaining power. The proposed concept is to overcome these problems through smart villages to encourage social change in rural communities. Farmers in villages who have limited land tend to be less prosperous, because their harvests are generally sold to middlemen, because farmers still lack information regarding marketing and market prices. Digital technologies can be applied more widely in agri-food systems to achieve the sustainability principles outlined in policy strategies (MacPherson et al., 2022). With the rapid growth of information technology, one solution that is expected to solve difficulties in the agricultural industry is through a smart village which has the concept that information will spread quickly and collaborate with various views, including village communities, farmers, consumers, the media and the government. This study is intended to provide an overview and input to the village government to consider the smart village concept as an integrated concept and capable of providing answers to existing problems in the village. The smart village concept needs to be considered. Smart villages facilitate sustainable development in rural areas by providing access to sustainable energy, improving infrastructure and education services, which overall improves the quality of life of farmers and other villagers (Singh et al., 2022). Smart villages support increasing farmers' bargaining power with the integration of digital technology that facilitates better access to market information and distribution networks, enabling farmers to make better price decisions and reduce dependence on intermediaries (Satoła & Milewska, 2022).

2. Methods

This study uses secondary data through literature searches in a number of journals and books related to smart villages and the welfare of farmers in villages. A literature review was also carried out on previous research and analysis related to government policies contained in government regulations to strengthen the concept of smart villages and farmer welfare. The sources used include journal articles, government reports, and publications from related organizations. Inclusion criteria focused on studies that explicitly addressed the application of technology in rural agricultural contexts and the resulting socio-economic impacts.

The key variables identified in this study include the application of technology in agricultural practices, government policies, and socio-economic impacts on farmers and village communities. These variables form the basis of the conceptual framework, which aims to explore the relationships between technological advancements, policy implementation, and improvements in farmer welfare and community well-being.

This approach is to validate previous research with existing regulations as well as proposals for solving existing problems in the village. The method focuses on a systematic literature review and analysis of existing data to examine the application process of smart village concepts. The approach emphasizes the integration of technology in agriculture and the role of supportive government policies. By reviewing secondary data, the study validates previous research findings and aligns them with current regulations, providing a comprehensive understanding of how smart village initiatives can enhance the welfare of rural communities and farmers.

3. Results and Discussion

3.1 Smart village overview

concept with the application of digital agriculture has significantly improved the economic conditions of farmers by increasing agricultural production. This helps in addressing the problems faced by rural areas such as lack of proper health care, education, and living conditions (Chowdhury et al., 2023). The smart village concept is focused on rural areas and communities by building on current strengths and assets and developing new opportunities. Further empirical studies comparing the implementation and outcomes of smart villages across different regions, particularly from established and updated journal articles, are needed to validate and contrast these findings. On the concept of smart village, tradition, network. and new services are enhanced through better digital technology. According to Renukappa et al. (2022), Smart Village is about the use of information and communication technology (ICT) and social innovation to overcome the challenges facing rural communities. Strategies that are considered important include smart energy, smart healthcare, smart transport, smart education and smart water. Telecommunications, innovation and the use of knowledge, for the benefit of rural communities and businesses. Digital technology and innovation can support quality of life, higher living standards, public services for citizens, better use of resources, less environmental impact, and new opportunities for rural value chains in terms of better products. Mohanty et al. (2020) explained that Smart Villages are built based on the philosophy of an independent ecosystem, able to adapt to changes in government regimes and produce resources to support human development. These initiatives include education, health, sanitation, information connectivity, electrification and small-scale industrial development. The smart village concept does not propose a one-size-fits-all solution. Smart villages are implemented based on regional sensitivity based on the needs and potential of each region and the strategy is supported by new or existing territorial strategies. The important thing in a smart village is technology in investing in infrastructure, business development, developing community human resource capacity. By adopting the smart village model, rural

communities can face the challenges of modernity by leveraging technology to strengthen traditions and promote sustainable development. This approach not only paves the way for innovation and renewal, but also provides an opportunity to revitalize sustainable and resilient rural communities.

The emphasis on the smart village concept is based on information technology in terms of its implementation, although there are still many interpretations of the smart village itself. The implementation of smart villages in each village varies depending on the capabilities of village elements. According to Ayu (2018); Munir (2017); Nazarudin (2017) in Herdiana (2019), several villages in Indonesia have implemented smart villages including: Pondok Ranji smart village in South Tangerang which was declared the first smart village in Indonesia by the Ministry of Villages because it succeeded in developing non-formal education pursuing packages A, B and C . Cibuntu Village, Cirebon City, was declared a smart village because it succeeded in encouraging the manufacture of bolic pans to strengthen cellular signals so that internet access was easy. Geluran Taman Village, Sidoarjo Regency, was declared a smart village due to efforts to encourage informal use of English among its residents. Pacing Village, Klaten Regency, was declared a smart village because it succeeded in building a mosque with an eco-architecture concept. These villages are proof of efforts to develop village potential based on their respective abilities. However, seen in the context of smart villages, there is no agreement as to what the ideal concept of "smart" should be when attached to villages. A smart village concept that is not only able to implement the use of information technology, but is also able to develop village potential, improve the economy and create a quality of life for the community based on the use of information technology (Herdiana, 2019). Mishbah et al. (2018) proposed a Smart Village conceptual model consisting of objectives, strategies, dimensions and foundations. The model identifies seven focus areas including economy, ICT, society, government, environment, life, and energy, which provides a rich theoretical framework for the study of Smart Villages.

The dimensions of a smart village according to Rini Rachmawati (2018), namely 1) smart government (smart governance), 2) smart society (smart community), 3) smart economy (smart economy), and 4) smart environment (smart environment). Meanwhile, those related to smart mobility, smart transportation and smart people are less suitable when applied as achievement targets for Smart Villages. Regarding smart branding, several villages that have potential can be directed towards achieving it. Utilization of information technology systems is an absolute must in achieving the success of a smart village. Herdiana (2019) explained that the development of smart villages will support smart districts and smart cities. In general, the smart village concept prioritizes the local genius of the community combined with technological systems. The basic framework of a smart village from the bottom up approach aspect, the government's position as a facilitator, the community as a customer, the development process by strengthening awareness of the participation of all elements, priority targets for middle poor and under-employed communities, the key to success is that the socio-cultural approach is the main basis. Having a valid identification of various values, characters, norms and problems that exist in society is the basis for the success of a smart village; and the aim of implementing smart villages is to realize empowerment, strengthen institutions and improve the welfare of rural communities based on the use of information technology. The smart village concept has influenced the improvement of farmers' welfare through the adoption of smart agriculture and digital infrastructure that improves access to markets and basic services. Studies from Poland show that by implementing smart village principles, rural areas can achieve sustainable development and resilience to economic or environmental crises (Adamowicz & Zwolińska-Ligaj, 2020).

The smart village concept is a new representation for the community to create synergy between local wisdom and information technology systems. This concept will be very relevant to changes in the social behavior of village communities in interacting in community and other activities. The concept of social change itself will be formed over time

due to era disruption. On the other hand, the main challenges in implementing Smart Villages are limited budgets, lack of sustainable development strategies, and minimal collaboration between stakeholders. (Renukappa et al., 2022). The location aspect is also a challenge for smart rural development which must be implemented with a place-based approach to ensure that technological solutions have a positive impact on society (Zavratnik et al., 2018).

3.2 Concept of social change in village community

Social change in the context of smart villages includes increasing access to technology, strengthening community independence through locally designed and sustainable solutions, and increasing collaboration between village residents and external parties to overcome specific challenges faced by rural communities. Evaluation of farmer welfare in the transition to a smart village is a critical aspect that assesses the impact of adopting technology and smart agricultural practices on the lives and livelihoods of farmers as village communities. Renukappa et al. (2022) highlight how smart villages are seeking to improve declining local services by taking advantage of the digital transition. According to Horton and Hunt (1987) in Damsar and Indrayani (2016), society is people who are relatively independent, who live together for quite a long time, who inhabit an independent area, have the same culture, and carry out most of their activities in groups. the. This community pattern is formed culturally through a long process within the group. According to Law no. 32 of 2004 concerning regional government, a village is a legal community unit that has territorial boundaries that has the authority to regulate and manage the interests of local communities based on local origins and customs that are recognized and respected in the government system of the Unitary State of the Republic of Indonesia. The village concept shows that there are social patterns that are formed in society. Rural areas based on the origins of community customs are synonymous with social change.

Humans are dynamic creatures in their daily lives. Social change occurs because humans are part of the symptoms of social change and social change certainly occurs in multisectors. Social change is any change to social institutions in a society, which affects its social system, including values, attitudes and behavioral patterns among community groups. According to William F. Ogburn, the scope of social change includes both material and immaterial cultural elements, what is emphasized is the influence of material elements on immaterial elements. The concept of social change according to Gillin and Leibo (1986) in Irwan & Indraddin (2016), social change is a change that occurs in human life which is accepted, oriented to changes in geographical conditions of material culture, population composition, ideology, and diffusion in discoveries. -new thing. Social change is a basic concept for innovation and acceptance of new things both from within and from outside.

The dynamism of humans, especially rural communities, will trigger the diffusion of innovation and adoption in society for a long time. Diffusion of innovation is basically the process of how innovation is conveyed through certain channels over time to a group of members of a social system (Rogers, 1995). This process will cause social change in society. Forms of social change are divided into 2, namely, slow change (evolution) and fast change (revolution). Evolution is gradual change or development in living things from one generation to another, while revolution is large, sudden and rapid change (Osman & Chong, 2019).

The process of agricultural modernization really requires knowledge and information. Knowledge sources, agricultural counseling and internet-based platforms are increasingly trusted by farmers for effective agricultural management. The study by Renukappa et al. (2022) emphasize that smart village adoption is often hampered by limited budgets, lack of clear development strategies, lack of collaboration between stakeholders, and lack of knowledge regarding the smart village concept. This research suggests that smart energy, smart health, smart transportation, smart education, and smart water are important

strategies in smart village development that can directly influence improving the quality of life of farmers (Renukappa et al., 2022). Mujeyi et al. (2021) show that the adoption of climate-smart agriculture has improved food security and household income, highlighting the role of CSAs in optimizing agricultural productivity.

Adesipo et al. (2020) explored the link between smart agriculture and smart villages, emphasizing the importance of smart sensor technology in agriculture to reduce agricultural losses and optimize processes for increased yields. This study suggests that smart agriculture should be a priority in the development of smart villages. Ilham et al. (2022) evaluates that the integration of agriculture 4.0 concepts in the smart village program supports improving the welfare of rural communities by minimizing input use, optimizing agricultural processes to increase yields, and enabling predictions that are useful for farmers. The application of IoT in Smart Villages helps in designing efficient and safe technical ecosystems (Degada et al., 2021).

3.3 The influence of smart villages in encouraging social change in village communities

Smart villages are not just about implementing technology but also about how rural communities can use social and technological innovation to respond to existing and future challenges. To better understand these dynamics, additional empirical studies comparing various smart village implementations, especially using data-driven methods, should be conducted and discussed. The process of developing a smart village requires an analysis of the various values, characters and norms that exist in society. This is important because society is positioned as customers of information technology. Based on research by Adamowicz and Zwolińska-Ligaj (2020), the smart village concept has great potential in facilitating sustainable development in rural areas. This study emphasizes the analysis of the smart growth potential in different regions of Poland and proposes that more attention needs to be paid to strengthening the links between rural communities and nearby towns and cities . The community is given priority regarding which potential and character they want to develop and institutionalize through the support of information technology, so that appropriate use of technology will be created based on the needs and character of the community within the framework of a smart village. This is reinforced by previous research which shows that the importance of a community-based approach in developing smart villages provides social sustainability effects that can be achieved through solutions that consider community needs through three dimensions (smart living—energy, mobility and waste management) (Zavratnik et al. , 2020). Another reason, namely by having an in-depth identification of the various existing values, characteristics and norms, will determine the size of the information technology that will be used, considering that the adoption of information technology in practice requires quite a lot of money. So, in the end it is hoped that there will be conformity between values, character and norms (Herdiana, 2019).

Social changes resulting from smart villages include elements that exist in smart villages, namely smart government, smart community, smart economy, smart living, smart environment, and smart mobility. Following are some of these changes according to the author's analysis based on community service activities in Gondangmanis Village, Karanganyar: a) smart government, changes in administrative patterns and meetings of village officials, which previously used conventional administration using books, now uses online archive media using Microsoft documents; b) Smart community, changes in the interaction patterns of village communities, which increasingly rarely meet in person to provide certain information because of the existence of WhatsApp groups at every level, including *rukun tetangga*, *rukun warga*, Hamlet, Village, and in every organization; c) Smart living, in the sample village community, the community continues to uphold social capital so that existing cultures such as tahlilan, yasinan and kenduri in the village remain sustainable, only information related to this is via WhatsApp media; d) Smart economy, the most striking change occurs in this element. Society has changed its method of selling merchandise from

previously only relying on customers visiting it, now it is creative by using social media to sell its merchandise so the pattern has shifted; e) Smart environment, the existence of a smart village cannot greatly change the environmental conditions in that area; f) smart mobility, this has been implemented with various improvements to village road access to support people in outward mobility for work. There is no implementation of a sustainable environment to optimize village potential so it cannot be said to be a smart village implementation. The realization of technological intervention in smart villages can be carried out to support relations between governments (Figure 1). The following is the relationship between the government and the information technology-based environment (Herdiana, 2019).

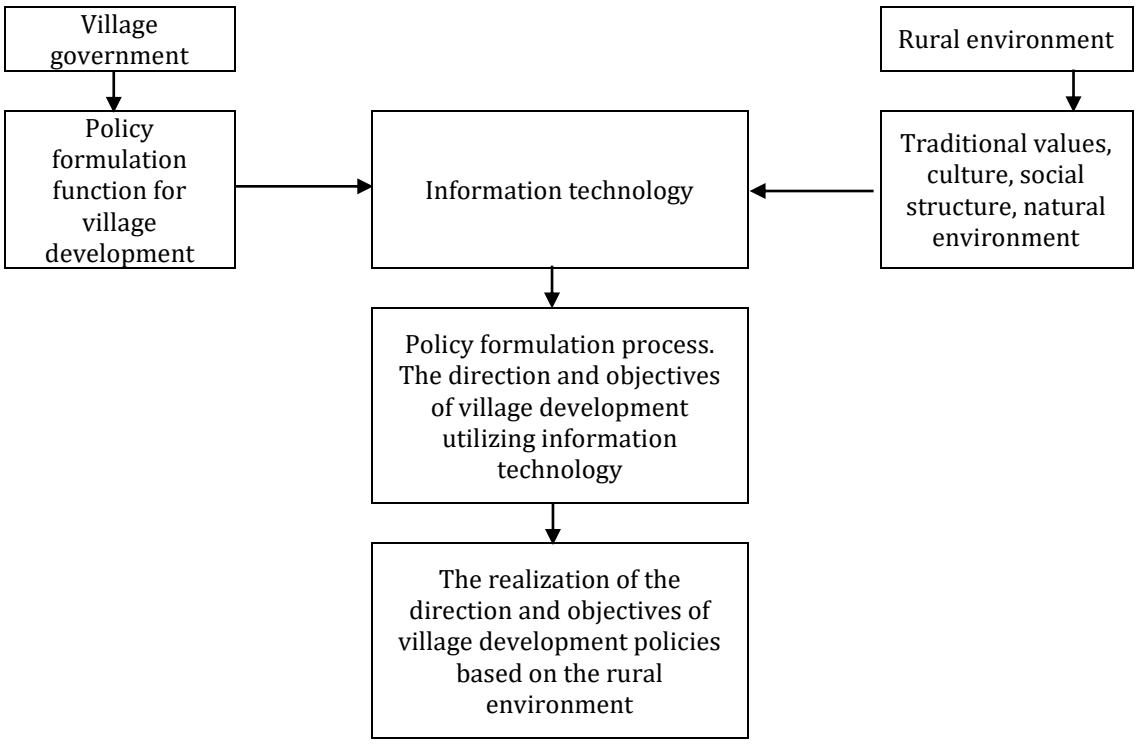

Fig. 1. Flowmap of the relationship between government and the information technology-based environment

It can be seen from the flowmap that the direction of information technology intervention is synergism between the function of the village government and the values, culture, social structure and natural environment of the village to realize information technology-based rural development policies. Another form of synergy is rural communities with the rural environment. This relationship illustrates that information technology intervention in rural communities and the rural environment is based on the development and utilization of traditional, cultural, social and environmental values in creating a sustainable environment so that the existing environmental potential can be utilized by the community (Figure 2). These efforts will ultimately form an inclusive cycle in society so that it is not dependent on the outside world. The influence of smart villages on village communities in general is changes in village communities to adapt to developments in the era, especially the disruption era. Good disruption is maintaining the local genius of village communities as the main capital in planning, implementing and evaluating village development so that a holistic information technology system intervention emerges without ignoring existing values.

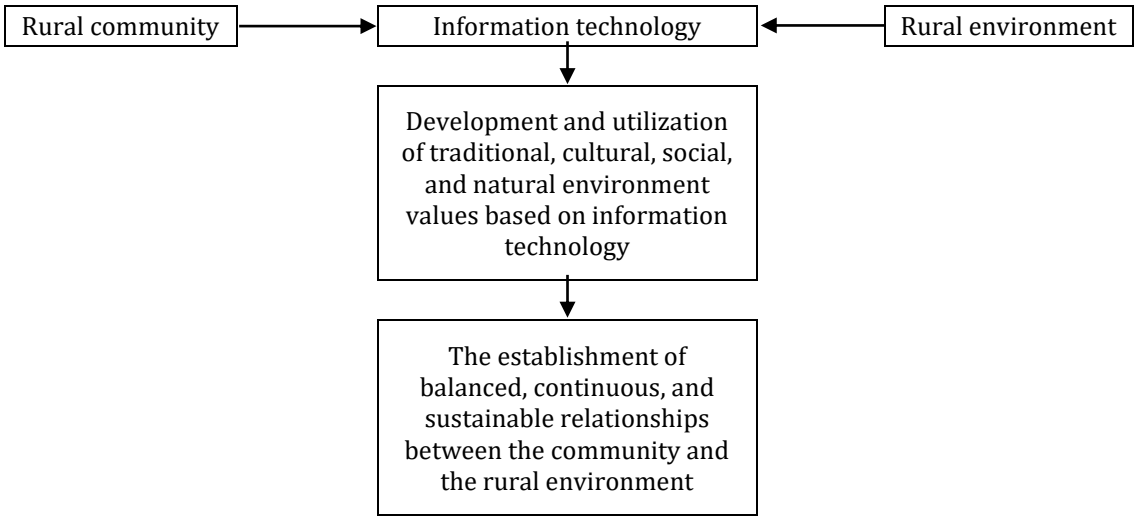

Fig. 2. Flowmap of the relationship between rural communities and the rural environment

The use of smart sensors and Internet of Things (IoT) technology in agriculture has enabled farmers to obtain timely information regarding weather conditions and soil nutrient management, which is important for increasing agricultural productivity (Maheswari et al., 2019). Therefore, farmers can gain knowledge about their agricultural cultivation which enables them to make more precise and data-based decisions. The use of smart sensors and monitoring technologies can optimize agricultural processes and reduce losses, strengthening farmers' negotiating position with buyers and suppliers (Adesipo et al., 2020). Adoption of climate-smart farming techniques has been shown to increase food security and household income, demonstrating a significant positive impact on farmer well-being (Mujeyi et al., 2021).

According to Satoła and Milewska (2022), the smart village concept also involves the provision of better public services in rural areas. By improving infrastructure and accessibility to basic services, including education and health, farming communities can improve their quality of life and independence. This indirectly strengthens their position in negotiations and economic transactions, strengthening their bargaining power (Satoła & Milewska, 2022). In research in Poland by Adamowicz and Zwolińska-Ligaj (2020), it was found that the implementation of smart villages can facilitate sustainable development in rural areas by strengthening relations between villages and cities. This includes increased access to larger markets and advanced technology, which can help farmers increase their bargaining power through increased access to information and markets (Adamowicz & Zwolińska-Ligaj, 2020).

Zerrer & Sept's (2020) research discusses how digital social innovation can be implemented in rural areas through projects such as smart community centers and digitally managed car-sharing. This shows that digitalization in rural areas is not just about technology but also about addressing social problems such as limited mobility and decreased community interaction. Smart villages must prioritize community-centred development, where sustainable solutions are not only achieved through technology but through processes that are adapted and led by people's needs. They analyze three dimensions of smart living—energy, mobility, and waste management—by linking them to the linkages between rural and urban areas and the role of ICT in this. Zavratnik et al., 2020.

Based on previous research, Smart villages are able to stimulate social change by integrating village residents in the digital economy, increasing access to health and education services through technology, and strengthening community resilience to economic and environmental changes. This helps rural communities to not only survive in changing global market conditions but also to prosper in the long term (Komorowski & Stanny, 2020).

3.4 Supporting factors for implementing smart villages

Farmers who experience limited land and capital tend to have low bargaining power. Empirical evidence highlighting the differences in outcomes for farmers within smart villages versus traditional villages would provide a clearer picture of the effectiveness of these initiatives. Farmers' margins are low when selling their crops to middlemen because the farmer's position is weak, so it is the middleman who makes the biggest profit. This is a crucial problem, namely the lack of independence of farmers and dependence on middlemen. Increasing farmers' independence and income can be achieved through agricultural digitalization to connect agricultural producers with customers, land processing, production processes and post-harvest. This is in line with Paramitha and Sulomo (2018) where farmers are the parties who feel the most disadvantaged because farmers generally have a low bargaining position. The bargaining position of farmers is relatively low because farmers do not play a role in determining commodity prices. Farmers also tend to have difficulty finding price information. The application of information technology can be a solution in changing agriculture in Indonesia. Changes can be made through existing concepts in the area, one of which is through the smart village concept in the area where farmers live. The use of technology and information has a good but weak relationship with several indicators of community welfare (Casanova et al., 2021). Therefore, to maximize the results of the smart village concept, participation from various parties is needed.

Local community participation and the use of digital technology in villages, which means local community participation in improving their economic conditions and social environment, collaboration with other communities, and social innovation in the development of smart villages (McEldowney, 2021). Farmer corporation participation is an activity of combining farming land to be managed jointly by farmers and integrated into one management. This shows that the togetherness of farmers is a strength in forming corporations. The embodiment of this corporation is to improve the welfare of farmers from the grassroots. Farmer-Owned Enterprises are representatives of these corporations. The formation of BUMP is based on the cooperative spirit with the principle of share ownership by each farmer so that there is optimization of natural resources, human resources and social resources in rural areas through a cooperative process (Pakpahan, 2010). Farmer-Owned Enterprises (BUMP) are an institutional innovation for empowerment towards farmer independence. BUMP is also a farmer institution that is based on empowerment aspects based on meeting economic and social needs. BUMP is also a farmer institution that is based on empowerment aspects based on meeting economic and social needs. BUMP was formed based on the concerns of farmers who were always at the bottom because they did not have competitiveness in marketing and developing their products. This concern was accommodated by BUMP, where farmers were guided to form and run their business entities as a group, so that the profits obtained could be used to improve the farmers' standard of living. The BUMP foundation shows a bottom-up principle in its operation so that it is based on shared goals between farmers and decision making involves the whole community so that it can be carried out together.

The presence of BUMP is very profitable in terms of marketing, BUMP is a form of simplifying the marketing cycle for agricultural products. In fact, so far the marketing cycle for agricultural products from harvest to consumer hands can reach five or six chains. This has a big impact on price issues. The longer the marketing chain, the higher the price of agricultural products in the hands of consumers. With the existence of BUMP, the marketing chain can be shortened by sending agricultural products directly to BUMP. Where BUMP has collaborated with companies to establish business. Generally BUMPs are in the form of Limited Liability Companies (PT), so BUMPs are also protected by Law no. 40 of 2007, but it does not rule out the possibility of BUMP taking the form of a cooperative, it all depends on the wishes of the farmers. BUMP can be developed as a hybrid of a company and a cooperative, which means the spirit is like a cooperative but in the form of a company (PT).

Mardikanto (2009) introduced BUMP as a hybrid between business institutions and empowerment institutions. This means that BUMP is not just a professional business institution, but prioritizes the function of empowering the community, especially farmers. The benefits of empowerment are the various benefits felt by farmers and other stakeholders due to the existence of BUMP, both socially and economically. In the BUMP perspective, forms of empowerment efforts are divided into four "capacity development", namely human capacity development, business capacity development, environmental capacity development, and institutional capacity development. Human capacity development is related to how to increase farmers' resource capabilities, the presence of BUMP changes the behavior of farmers from subsistence farmers towards increasingly advanced commercial farmers. Business capacity development is related to how to increase economic capacity with various productive businesses, the presence of BUMP can shorten marketing channels for each agricultural product and develop networks and partnerships. Development of environmental capacity is more directed towards the sustainability of limited natural resources, and with the existence of BUMP it also pays attention to the maintenance and preservation of the agricultural environment. Development of institutional capacity is more related to farmer organizations which are able to become a forum that can encourage farmer independence and empowerment. With the existence of BUMP, existing institutions will be more effective. These various capacity developments facilitate farmers to improve their welfare. Weak institutional capacity will be strengthened by the existence of BUMP so that farmers' collective bargaining position will increase and they will be able to determine the price of their farming products so that the market will gradually stabilize and prioritize farmers' welfare. In the context of BUMP institutions, implementing the smart village concept can significantly increase farmers' bargaining power by supporting them through increased access to technology, market information and better public services. This helps in creating a more empowered and self-reliant ecosystem for farmers to optimize the value of their production. Therefore, BUMP can be directed towards digitalization in realizing a smart village. The orientation of the use of digitalization is on managing digital technology-based governance processes (Cahyarini, 2021).

4. Conclusions

The discussion regarding the influence of smart villages on social change in village communities can be concluded in several ways as follows 1) the smart village concept is a new representation for the community to create synergy between local wisdom and information technology systems; 2) social changes in village communities are based on the dynamism of village communities in an era of disruption, resulting in various changes in life, both evolution and revolution; 3) the influence of a smart village on village communities in general is changes in village communities to adapt to developments in the era, especially the disruption of the information technology system era, resulting in a shift in social habits carried out by the community. Smart villages offer a sustainable development model by integrating technology, social innovation and local wisdom. Smart villages will have a good effect on social change in village communities if social change prioritizes the local genius of local communities so agents are needed to preserve it.

Information technology system intervention in smart villages should be able to grow in a positive direction for village communities to support the economy and mobility so facilitators are needed in implementation. smart village, Social changes in smart villages tend towards evolution so that people must adapt quickly so as not to be affected by other changes. Smart Village is expected to reduce the ineffectiveness of existing marketing channels; so that farmers have information regarding prices of agricultural products, market conditions, raw materials, and market or agricultural developments, on the other hand, village communities get the best prices from farmers, so that the social and economic welfare of farmers and village communities can increase. The application of the smart village concept provides a great opportunity to improve the welfare of farmers through the

use of modern technology in agriculture which not only increases production but also ensures sustainability and a better quality of life. This shows the importance of technology integration in rural and agricultural development.

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