

SOCIO-ECONOMIC TRANSFORMATION OF FARMERS THROUGH DIVERSIFICATION OF FARMING BUSINESSES IN THE DIGITAL ERA

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Abstract

This research aims to examine the socio-economic transformation of farmers through the diversification of farming businesses that are integrated with the use of digital technology. A descriptive qualitative approach was used with data collection techniques through in-depth interviews, participatory observations, and documentation studies in several agricultural areas in Indonesia. The results of the study show that farmers have begun to carry out various forms of diversification, such as processing agricultural products, integrating agriculture-livestock, and utilizing agricultural services. Digital technology is used for promotion, sales, and business management through e-commerce platforms, social media, and agricultural applications. The positive impacts that have emerged include increasing income, business independence, changing mindsets, and increasing the role of women in the farmer household economy. However, there are still obstacles such as limited digital infrastructure and low technological literacy. These findings underscore the importance of cross-sectoral support to create an inclusive and sustainable digital agriculture ecosystem. This transformation shows the great potential of modern agriculture in driving rural economic and social development in the digital age.

Keywords: *Social Transformation, Diversification of Farming, Digital Agriculture, Farmers, Rural Economy*

INTRODUCTION

Agriculture is a sector that has a vital role in the national economy, especially in agrarian countries such as Indonesia (Arifin, 2004). This sector not only provides food needs, but also becomes a source of livelihood for millions of people, especially in rural areas. However, global dynamics and technological developments have brought new challenges to farmers. Dependence on one type of commodity and traditional planting patterns often leads to vulnerability to market price fluctuations, climate change, and crop yield uncertainty (Budiman & Suhendi, 2024). In the midst of these challenges, the concept of diversification of farming has emerged as one of the strategic solutions to increase the economic resilience of farmers (Surasmi et al., 2022). Diversification of farming refers to efforts to expand the type of business run by farmers so that they do not depend on just one commodity or activity (Hidayat, 2023). This diversification can be in the form of planting various types of plants, livestock, fisheries, and processing agricultural products. More than just expanding the type of business, diversification also opens up opportunities to increase income and economic stability of farmers' households.

Along with the advancement of the times, the digital era has brought significant transformations in various aspects of life, including the agricultural sector. Digital innovations such as the internet, social media, e-commerce, and application-based technology have opened up new opportunities in the development of farming businesses (Marsini, 2025). The use of digital technology allows farmers to access market information, weather forecasts, modern cultivation techniques, and product marketing opportunities more widely and efficiently. This encourages the creation of an agricultural ecosystem that is more inclusive and adaptive to change. Digital transformation also creates space for farmers to become more independent and competitive business actors (Yazid et al., 2022). By utilizing digital platforms, farmers can now reach consumers directly, cut the distribution chain, and increase the added value of their products. The socio-economic transformation of farmers is not only related to material aspects such as increased income, but also includes changes in mindsets, skills, and social networks (March, 2024). Farmers

who used to rely only on conventional methods are now required to be able to innovate and manage their businesses in a modern way. In this context, diversification of farming in the digital era is the entrance to the socio-economic transformation of farmers. This change does not happen instantly, but through a process of learning, adaptation, and support from various parties, including the government, the private sector, and educational institutions. Diversification integrated with digital technology can change the face of agriculture from the subsistence sector to a productive, efficient, and sustainable sector. In fact, farmers can be part of a high-value agriculture-based creative economy. The social changes that occur are also seen in the relationship between farmers, between farmers and consumers, as well as farmers and supporting institutions. This relationship is increasingly open, transparent, and collaborative thanks to the use of rapidly developing communication technology (Marsini & Dwikoranto, 2022). Farmers who are able to adapt to digital transformation tend to be more progressive, open to innovation, and active in community networks.

This shows a shift in the role of farmers from just producers to smart and skilled farm business managers. In addition, this transformation has also increased the participation of the younger generation in the world of agriculture. When agriculture is seen as a modern and promising sector, the interest of the younger generation to return to the village and develop farming business becomes greater (Marsini & Dwikoranto, 2022). Digitalization also accelerates the flow of information and education for farmers. Online trainings, video tutorials, and digital discussion forums provide wider and more flexible access to learning (Marsini, 2023). However, this socio-economic transformation also faces a number of challenges, especially related to the limitations of digital infrastructure in rural areas, digital literacy of farmers, and access to financing and markets. Therefore, the role of the government is very important in creating an ecosystem that supports this transformation, through participatory policies, infrastructure development, and the provision of ongoing training and mentoring. The role of the private sector is also equally important in developing inclusive and innovative business models that actively involve farmers, both as business partners and as key actors in the agricultural value chain. Educational and research institutions have a strategic contribution in providing data, technology, and research-based policy recommendations to support the socio-economic transformation of farmers. This research aims to examine how diversification of farming businesses, supported by the use of digital technology, can encourage socio-economic transformation of farmers. This study also wants to look at the dynamics of change that occurs as well as its supporting and inhibiting factors. By understanding the transformation process, it is hoped that various policies and programs will be born that can strengthen the position of farmers in facing the challenges of the digital era, while accelerating the development of inclusive, competitive, and sustainable agriculture.

RESEARCH METHODS

1. Approaches and Types of Research

This research uses a descriptive qualitative approach with the aim of understanding in depth the process of social and economic transformation of farmers through the diversification of farming businesses in the context of the use of digital technology (Agustianti et al., 2022). This approach was chosen because it is appropriate to explore the social dynamics, subjective experiences, and behavioral changes that occur among farmers.

2. Location and Research Subject

The research was carried out in several agricultural villages that have implemented digital-based farming diversification, for example in Sleman Regency (DIY), Malang Regency (East Java), and Garut Regency (West Java). The selection of the location was carried out purposively with the consideration that the area has relatively good digital access and there is a farming community that is active in farming innovation.

The research subjects consisted of:

- Farmers who diversify their farming businesses.
- Agricultural Companion (Extension Officer).
- Digital-based agricultural business actors (agricultural start-ups, agricultural e-commerce).
- Village/sub-district officials related to agricultural development.

3. Data Collection Techniques

Data is collected through the following methods (Data, 2015):

- In-depth interview: conducted with farmers, extension workers, and agricultural digital business actors to obtain qualitative data on experiences, challenges, strategies, and impacts of the transformation that occurred.

- Participatory observation: the researcher also observed farming activities that have diversified and utilized digital media, such as the use of online buying and selling platforms, social media for product promotion, and agricultural applications.
- Documentation study: collecting secondary data from village documents, government reports, scientific articles, statistical data, and reports of agricultural organizations related to the development of digitalization and diversification of farming businesses.

4. Data Analysis Techniques

The data that has been collected is analyzed using thematic analysis techniques (Miles & Huberman, 1992).

The analysis procedure includes:

- Data reduction: filtering relevant information from interviews and observations.
- Categorization: grouping data based on themes such as forms of diversification, technology utilization, social change, and economic change.
- Interpretation: interpreting the meaning of the findings according to relevant theories (e.g. modernization, sustainable development, and social innovation theories).

5. Data Validity Test

To ensure the validity of the data, triangulation techniques are carried out, namely:

- Source triangulation: comparing data from different informants.
- Triangulation method: comparing the results of the interview with observations and documentation.
- Member check: the findings are confirmed back to the informant to avoid misinterpretation.

6. Research Ethics

Researchers uphold the ethical principles of research, by:

- Seek approval from the informant before the interview or data collection.
- Maintain the confidentiality of the identity of the informant.
- Avoid misuse of data for purposes outside of academic contexts.

RESULTS OF RESEARCH AND DISCUSSION

1. Pattern of Diversification of Farming Businesses in the Digital Era

The results of observations and interviews show that most farmers have started to diversify their businesses in the form of:

- Multicommodity cultivation (e.g., rice, horticulture, and medicinal plants).
- Integration of agriculture with livestock (e.g.: goats, catfish, and poultry).
- Processing of agricultural products into ready-to-consume products (e.g., banana chips, herbal drinks, liquid organic fertilizers).
- Agricultural services such as farm equipment rental and organic farming training.
- This pattern is driven by the need to increase revenues, reduce the risk of crop failure, and capture broader market opportunities.

These results show that digital cooperatives are starting to attract the interest of the young generation who are technologically literate and relatively well educated, so that it is easier to accept digital service innovations. The diversification of farming carried out by farmers reflects a form of adaptation to market dynamics and agricultural risks. These findings are in line with the theory of Rural Livelihood Diversification by (Ellis, 2000), explaining that rural households tend to develop diverse economic strategies to strengthen livelihoods, including by expanding sources of income from agriculture and non-agriculture. In the context of this study, farmers not only rely on staple crops but also start processing agricultural products, raising livestock, and even offering agricultural services. This shows that farmers are able to play a dual role, as producers and innovative micro business actors. This diversification also shows a transition from traditional farming systems to modern agriculture that is more responsive to market needs (Soedarto & Ainiyah, 2022). In the framework of sustainable development, diversification plays a role in optimizing local resources and reducing pressure on the environment because rotation and variation of commodities can improve soil health and input efficiency.

2. Utilization of Digital Technology in Farming

Farmers are starting to utilize digital technology in various aspects of farming. Digital adoption includes:

- Weather and cultivation applications: to determine the planting time and use of fertilizers.
- Agricultural e-commerce platforms: such as TaniHub, SayurBox, Shopee for direct sales.
- Social media (Facebook, WhatsApp, Instagram): used for promotion and communication with consumers.
- E-wallet and QRIS: in transactions of buying and selling agricultural products.

Digital technology makes it easier for farmers to access information, expand market reach, and improve the operational efficiency of farming. The results of the study show that digital technology has become an important catalyst in accelerating the transformation of farming businesses. The use of weather applications, e-commerce platforms, social media, and digital payment systems is a form of technology integration in agricultural practices. This is in line with the Diffusion of Innovation theory of (Rogers, 2003), which states that innovation will be adopted faster if it is felt to provide immediate benefits, is easy to use, and can be tried first. The farmers involved in the study showed that they adopted the technology because of its practical benefits, such as improving market access and distribution efficiency. This is proof that digital agriculture is not just a concept, but has become a real practice that supports the productivity and competitiveness of farming businesses. Furthermore, digital technology shortens the distribution chain and opens up wider market opportunities (Hasanah et al., 2024). This model strengthens the bargaining position of farmers in the market, as they can directly interact with consumers without going through intermediaries. This situation is in line with the idea of market empowerment which emphasizes the importance of the direct involvement of small businesses in the digital market system.

3. Social and Economic Impact of Digital Farming Business Diversification

Digital transformation and diversification of farming businesses have a number of significant impacts on the social and economic life of farmers. The data from the interview results are presented in the following table:

Table 1. The Impact of Digital Farming Business Diversification on Farmers

Aspects	Positive Impact	Information
Income	Increased 20–50% in 1 year	Coming from a variety of new revenue streams
Independence	Farmers are more confident in managing their business independently	Not depending on middlemen
Social Networks	Forming a community of digital farmers, sharing information and markets with each other	Communication via WA/Telegram group
Mindset	More adaptive to technology and innovation	Open to training and updates
Gender Roles	Women are actively involved in digital processing and marketing	Manage social media and financial accounts

Digital transformation combined with the diversification of farming businesses has a real impact on improving farmers' welfare. As seen in the table of research results, there is an increase in income, independence, and participation of women and the younger generation in farming. This phenomenon supports the theory of Social Transformation by (Vrontis et al., 2022), explaining that technological changes can affect the social structure, values, and role of individuals in society. Farmers' independence in managing farming digitally also shows a shift from dependence on third parties (such as middlemen) to full control over the production and distribution cycle. In addition, women's involvement in the management of social media and the finances of farming indicates a change in the division of domestic and economic roles at the farmer household level. From an economic perspective, the increase in income from digital business diversification is proof that digital transformation is able to increase business efficiency and provide added value for agricultural products. This is in line with the modern agribusiness approach, where agriculture is no longer just seen as a production activity, but as an integrated business system from upstream to downstream.

4. Implementation Obstacles and Challenges

Despite much progress, farmers face a number of obstacles, including:

- Limited digital infrastructure in rural areas (internet signals, electricity).
- The level of digital literacy of farmers is still low, especially in the older generation.

- Business capital and access to digital platforms are not evenly distributed.
- Gap between farmers, where farmers who are connected to the community and extension workers adapt faster than those who do not.

Farmers said that continuous training and assistance from external parties are needed so that this digital transformation can be felt evenly. Although the results achieved are quite positive, the socio-economic transformation of farmers through digital diversification also faces a number of structural and cultural barriers. Limited infrastructure such as internet access and electricity in rural areas are the main challenges in equitable technology adoption. In addition, low digital literacy, especially among elderly farmers, hinders the maximum use of technology. This constraint can be analyzed through the Digital Divide Theory approach, which suggests that the gap in digital access and capabilities will create new disparities in society (Van Dijk, 2013). In this context, farmers who have training connections and support tend to be more advanced than those who do not have similar access. Therefore, a collaborative approach is needed between the government, the private sector, and educational institutions in providing infrastructure, continuous training, and access to business capital and markets. Intensive assistance is key so that all farmers, regardless of background, can benefit from digital transformation in a fair and sustainable manner.

CONCLUSION

The socio-economic transformation of farmers through the diversification of farming businesses in the digital era shows that agriculture is no longer a traditional sector that is left behind, but can adapt and develop dynamically along with technological advancements. Diversification of farming businesses run by farmers, such as the merger of agriculture and livestock, processing of agricultural products, and the provision of agriculture-based services, is a strategic step to reduce business risks and increase income in a sustainable manner. The use of digital technologies, including agricultural applications, social media, and e-commerce platforms, provides wider access to information, markets, and efficient transactions. This proves that farmers are not only producers of foodstuffs, but also as adaptive and competitive business actors. Agricultural digitalization has triggered significant changes in social aspects, ranging from increasing farmers' confidence, the formation of digital social networks, to the active role of women in the management of technology-based farming businesses. Increased income, independence, and openness to innovation are the main indicators of economic transformation that occurs. However, this change has not occurred evenly. Obstacles such as limited digital infrastructure, low technological literacy among older farmers, and access to capital and markets are challenges that need to be overcome immediately. The digital divide between farmers who have access to technology and those who have not been reached is a serious concern in efforts to equitably distribute development. Therefore, support from various parties government, private, academics, and the public is critical in creating an inclusive and sustainable digital agriculture ecosystem. Collaborative efforts in the form of training, mentoring, and infrastructure development will strengthen this transformation process. Thus, diversification of farming businesses integrated with digital technology can be a way for farmers to achieve economic welfare, social independence, and a strategic role in national development.

REFERENCES

- Agustianti, R., Nussifera, L., Angelianawati, L., Meliana, I., Sidik, E. A., Nurlaila, Q., Simarmata, N., Himawan, I. S., Pawan, E., & Ikham, F. (2022). *Metode Penelitian Kuantitatif Dan Kualitatif*. Tohar Media.
- Arifin, B. (2004). *Analisis ekonomi pertanian Indonesia*. Kompas.
- Budiman, L., & Suhendi, D. (2024). Resiliensi penguatan ketahanan pangan daerah di Indonesia. *Jurnal Perlindungan Masyarakat: Bestuur Praesidium*, 1(2), 63–71.
- Data, T. P. (2015). Instrumen Penelitian. *Kisi-Kisi Instrumen*.
- Ellis, F. (2000). *Rural livelihoods and diversity in developing countries*. Oxford university press.
- Hasanah, A. U., Andaryani, S., Sari, F. H., & Dwikurniawati, I. U. (2024). *Inovasi Pelayanan Publik Berbasis Teknologi Digital : Tantangan dan Peluang di Pemerintah Daerah*. 4, 5228–5235.
- Hidayat, A. (2023). *Diversifikasi Usaha Tani Dalam Meningkatkan Pendapatan Petani Dan Ketahanan Pangan Lokal*.
- Majid, A. (2024). *Kehidupan Sosial Ekonomi Petani: Studi Perubahan Sosial Masyarakat Di Desa Ulu Saddang*. IAIN Parepare.
- Marsini, M. (2023). Pengaruh Penggunaan Metode Proyek Pada Mata Pelajaran IPS di SDN Ngujung 2 Kabupaten Magetan Terhadap Prestasi Belajar Siswa Kelas IV. *Indonesian Journal of Social Science Education (IJSSE)*, 5(2), 104. <https://doi.org/10.29300/ijssse.v5i2.4016>

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- Marsini, M. (2025). Empowering young minds: Transforming social studies education to foster digital ethics in elementary schools. *Jurnal Civics Media Kajian Kewarganegaraan*, 22(1). <https://doi.org/10.21831/jc.v22i1.1352>
- Marsini, M., & Dwikoranto, D. (2022). Using Google Meet in Group Discussions to Improve Learning Activities And Students's Problem-Solving Ability During the COVID-19 Pandemic. *IJORER International Journal of Recent Educational Research*, 3(5), 584–597. <https://doi.org/10.46245/ijorer.v3i5.249>
- Miles, M. B., & Huberman, A. M. (1992). *Analisis data kualitatif*. Jakarta: UI press.
- Rogers, E. (2003). *Diffusions of Innovations* 5th ed Free Press. New York.
- Soedarto, T., & Ainiyah, R. K. (2022). *Teknologi Pertanian Menjadi Petani Inovatif 5.0: Transisi Menuju Pertanian Modern*. Uwais Inspirasi Indonesia.
- Surasmi, W. A., Suparti, S., Dwikoranto, D., Setiani, R., & Marsini, M. (2022). Pemberdayaan Karang Taruna Sri Tanjung Melalui Usaha Berbagai Olahan Dari Bunga Telang Di Masa Pasca Pandemi COVID-19. *Jurnal Inovasi Penelitian Dan Pengabdian Masyarakat*, 2(2), 160–171. <https://doi.org/10.53621/jippmas.v2i2.202>
- Van Dijk, J. A. G. M. (2013). A theory of the digital divide 1. In *The digital divide* (pp. 29–51). Routledge.
- Vrontis, D., Chaudhuri, R., & Chatterjee, S. (2022). *Adoption of Digital Technologies by SMEs for Sustainability and Value Creation : Moderating Role of Entrepreneurial Orientation*.
- Yazid, A. A., Rofiq, A., & Ismail, M. (2022). Transformasi Digital Dan Industri Halal Pada UMKM Kabupaten Banyuwangi. *Jurnal Istiqro*, 8(2), 215–224.