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Agricultural Economic Policy Model for Increasing Agricultural Digitalization Performance in Boyolali Regency

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ABSTRACT
Boyolali Regency is one of the areas in Central Java. Boyolali Regency itself has enormous potential in the agricultural sector. Agricultural economic policy is one of the things that is currently important for the government sector to formulate. This agricultural economic policy functions to bridge important strategies between farmers and the community and local government to determine the right steps in optimizing agricultural potential itself. This research aims to examine agricultural economic policy models for improving agricultural digitalization performance in Boyolali Regency. The method used in this research is an analytical descriptive method using primary and secondary data. Currently, the Boyolali Regency regional government is quite active in developing the agricultural sector, starting with infrastructure development, providing intensive care and assistance, and transforming into the digital sector. Digital development or transformation in the agricultural sector has a vital role in supporting the optimization of agricultural products in the Boyolali Regency. Even though this program has been carried out quite massively by the Boyolali regional government, it is important to continue to carry out further development. This digitalization also includes the use of appropriate and appropriate agricultural tools to make agricultural activities more effective.

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INTRODUCTION

Agricultural economic policy is one of the things that is currently important for the government sector to formulate. This agricultural economic policy functions to bridge important strategies between farmers and the community and local government to determine appropriate steps in optimizing agricultural potential itself (Arnott *et al*, 2021). Agricultural economic policies in Boyolali Regency are closely adapted to the potential of the region and the aim of improving the welfare of farmers (Anggorowati and Darwanto, 2021). Several common policies are implemented, such as improving agricultural infrastructure, subsidies and incentives for farmers, developing the downstream sector and processing agricultural products, as well as technological assistance and agricultural extension or digitalization.

The current development of information and communication technology has many impacts on people's daily lives. Basically, technological advances make human life easier and more practical, whereas things that were previously done manually can now be done more easily and quickly with the help of technology (Diamandis and Kotler, 2020). One

aspect of technology that is currently developing is digitalization. Digitalization is interpreted as a technology that involves communication and information activities carried out by society (Khaustova *et al*, 2024). In ancient times people used conventional media as a tool to communicate and disseminate information such as letters, newspapers, and radio broadcasts (Ogidi and Anthony, 2016). The use of conventional media to communicate and disseminate information is very ineffective, a lot of time, money and resources must be spent to access it. This digitalization helps the community and government in formulating good public policies, to optimize every potential that exists in each region, as well as described by Sira and Kuzio (2025).

In the contemporary world, characterized by globalization and invisible physical thresholds, the demands of new economic models within the framework of digitalization are becoming increasingly clear. Information and Communication Technology (ICT) opens up space for strategies that focus on automation and the continuous creation of information and knowledge (Agrawal *et al*, 2021). The traditional strategic planning process, which is based on episodic actions of vision definition and fixed priorities, for a period of four or five years, needs to be revisited (Bryson, 2018). This economic policy model in agriculture needs to be adapted and improved to meet market globalization, export regulations, and consumer desires, and to plan innovation systems. It is important to envision digitalization as a strategic tool that generates value, not as a resource end.

This article will examine how the agricultural economic policy model implemented by the Boyolali Regency government improves agricultural digitalization performance for farmers in Boyolali Regency.

LITERATURE REVIEW

Agriculture, as well as industry, is developing and accumulating traditional actions, automated processes, and intelligent machines. Digital agriculture is becoming a way to modernize, integrate and automate agriculture and promote it as economical, mechanized, intelligent, high quality and high yield. However, automating farming mechanisms only generates data for farming. Handling data with parsimony does not guarantee scientific practice or efficient application of agronomic knowledge. Digital farming overcomes concerns about cyberphysical clustering and arrives at Agriculture 4.0. Agriculture 4.0 as a technology capable of automating cyber-physical systems through networks and various machines. Changing this scenario requires a new vision of strategy that influences workforce operations culture, human and professional relations, and agricultural business models. There is no way to confirm the widespread adoption of Digital Agriculture and its derivatives because data alone only supports the timing of agricultural data collection and is not enough for their strategies. Changing this scenario requires a strategic vision that influences work culture, human, social and professional relationships, as well as agricultural business strategies. Consequently, Digital Transformation is a tool that reduces the complexity of emerging digital agriculture, offering opportunities for value creation in agricultural scenarios. Digital transformation as a means to revitalize businesses and increase effectiveness, sustainability and efficiency through innovation in product and service offerings (Hrustek, 2020; Skobelev *et al*, 2020; Duncan *et al*, 2021 ; Kadry *et al*, 2024.

RESEARCH METHOD

This research uses a qualitative descriptive approach with an analytical descriptive approach. Research with a qualitative approach is research that analyzes a specific current case or problem by relying on personal beliefs based on existing facts and historical data, then these facts and data are responded to, collected, analyzed and interpreted. The types of data used in this research are primary data and secondary data. Data collection methods for the analytical descriptive approach include documents, archival recordings, interviews, observations and physical devices (Mohajan, 2018).

The analysis technique used in this research is analyzed using data triangulation. Triangulation of data obtained through interviews, observation and documentation must be arranged systematically, organized into patterns, and selected which data are important for discussion and conclusions (Schlunegger *et al*, 2024). In this research, observations were carried out at the Boyolali Regency Government on farmers to observe various economic policy models in improving the performance of agricultural digitalization.

RESULT AND DISCUSSION

Currently our government is quite intensively developing digitalization technology for agriculture. The Boyolali district regional government, through its autonomy rights, can also adapt current agricultural policies into the digital realm, to further optimize existing agricultural potential. Apart from developing farmer infrastructure, providing training to farmers as well as providing subsidies and direct assistance, improving and digital transformation of the agricultural sector in Boyolali Regency is something that should be considered quite seriously.

Policies in the digital agricultural economic system, through the development of forms of remote work, can reduce gender bias and other forms of discrimination, this is because all agricultural economic actors can work over long distances in any form. such discrimination is far less entrenched in society, therefore, is less likely to influence the hiring process. The following are the results of research regarding economic policy models towards digitalization.

Table 1. Economic Policy Model

No.	Variables	Percentage
1	Digitalization training for farmers	20%
2	Integration of digitalization methods in the agricultural sector	33%
3	Budget Absorption in the Agricultural Digitalization Sector	24%
4	Digitalization campaign for farmers and policy makers	23%
	Total	**100%**

Sources : Author (2024)

Based on research results, economic policies in the agricultural sector have had a significant impact on the progress of digitalization. Among them, digitalization training for farmers contributed 20%, integration of digitalization methods in various sectors contributed 33%, budget absorption in the agricultural digital sector contributed 24%, and digitalization campaigns contributed 23%. Additionally, the agricultural digital economy can offer a new forum to facilitate integration within countries, which in addition to government-based initiatives, can encourage and facilitate social protection. For example,

online companies that seek to create platforms where people from minorities and different backgrounds can access training and engaging with technology companies.

Globalization in agricultural technology has led to the formation of complex and dynamic 'cross-border production networks'. By reducing costs and providing consumers with services at lower prices, digitalization of the agricultural economy can influence the structure of global value chains. For example, although the level of participation of small and medium enterprises (SMEs) is still limited, the digitalization of the agricultural economy can enable farmers to rely more on technology to advertise products, develop direct access to buyers by cutting intermediary costs, facilitate coordination mechanisms between buyers and sellers, and increase sales and using artificial intelligence and the Internet of Things (IOT) to promote and maintain efficiency and, therefore, competitiveness.

The development of the digital agricultural economy not only provides benefits but also triggers a number of polarization processes. These effects cannot be fully attributed to the digitalization of the economy and the economic developments within it. However, it cannot be denied that technological advances and the resulting delocalization of labor have a series of consequences both at the national and international levels. Policies on progressive economic digitalization can produce at least three forms: (1) between age groups; (2) skilled and unskilled labor; and (3) between and within regions. Some of these forms of polarization apply to different degrees to crowd-work services. When considering age groups, empirical research shows that individuals involved in the gig economy are relatively young (i.e. under 35 years old) and are better able to adapt to the changes introduced by the digital economy.

In an effort to propose effective solutions for agriculture in the digital era and propose ways to achieve competitive advantage, an analysis of various factors related to it is needed, especially those related to the policies of the Boyolali Regency government. The idea is that the integration of digital agriculture and digital transformation factors will support the development and implementation of Agriculture in the 4.0 era. The factors focused on knowledge, information sharing and human development are covered by different models in both situations. One does not negate the other and reinforces the idea that opportunities for sustainable agricultural development can be enhanced by integrating Digital Agriculture and Digital Transformation factors. The factors of digital agriculture focus on the application of tools that can be used in agriculture to capture, store and share field data. These tools are able to make the production process more manageable and oriented to field operations and sustainable. In addition to these tools, more than maintaining them, digital agriculture proposes data and metadata standards for resource integration, addressing the shortcomings of model integration. The factors of digital transformation, in addition to the technological cut, already mentioned by Digital Agriculture, present the idea of planning, growth and value creation. Based on the value delivery method

Digital agriculture is seen as a strategy for developing the agricultural landscape worldwide. With the aim of seeking competitive advantage in agriculture, a model is proposed that is aligned with the strategic objectives of the market and the driving forces of Digital Agriculture and Digital Transformation. The model has a macro view of five variables. The variables indicate the research, which maintains the cause and value relationship. The variables are: Political Regulatory Environment; Strategic Planning; Digital Transformation Roadmap, Digital Agricultural Transformation, and Competitive

Advantage. All variables considered in the research are recovered. Through continuous interaction, effective digital and business solutions for agricultural development are provided.

A second-level variable called Digital Agricultural Transformation was created. This variable consists of Digital Control and Integration Solutions, Business and Market Management, Value Creation, Partnership and Co-Creation and Human Development. Agriculture is a field composed of a large amount of information. This information comes from various sources and has different characteristics. This information has information on spatial domains, temporal variability, machines and production. Therefore, there is a need for digital tools that support the capture, processing and storage of industrial information and provide measurements that can be used reliably in agriculture. The application of digital solutions is based on the model as a practice that directly supports the revival of the agricultural sector, providing useful and timely information. New business models require partnerships and interdependencies to face market challenges. Collaboration networks are formed, both client networks and networks of contacts and collaborations between companies. Relationships with suppliers, consumers and universities, among others, are seen as organizational strategies to create value and gain competitive advantage.

On the other hand, the agricultural sector is under a global market regime. Agricultural producers present an inaccurate idea of the market. Moreover, this information does not even reach them in time. Nevertheless, the competition of the era consists of digital disintermediation sectoral boundaries are fluid, and the definition of competitors is complicated. Maintaining the system with market and business environment information optimizes farmers' decision-making, who are then provided with useful and timely information. Prices, harvests, world best practices, market analysis information, and industry forecasts can be shared.

The government can be characterized as a contributor, proposing funding and investment policies based on system data, conducting business transactions through, issuing alerts, and more.A fully automated and digitalized farm cannot be expected. Modern agriculture is expected to generate higher quality incomes at lower costs in a sustainable manner and is labor-dependent. In this regard, one must worry about the development and talent of the entire team. Farmers are often unaware of techniques and innovations and are not ready to understand the data provided by digital tools.

CONCLUSION

The Boyolali regional government's policy in the agricultural economy is certainly determined by various factors that influence the community's agricultural system itself. Currently, the Boyolali Regency regional government has been quite active in developing the agricultural sector starting from infrastructure development, providing incentives and assistance to transformation into the digital sector. Digital development or transformation in the agricultural sector has a very important role in supporting the optimization of agricultural products in Boyolali Regency. Although this program has been carried out quite massively by the Boyolali regional government, further development is important to continue to be carried out, this digitalization also includes the use of appropriate and precise agricultural tools to make agricultural activities effective.

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