



## Innovation Management Model in Supporting Healthy Food Availability Through the Development of Zoning-Based Organic Farming

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### ABSTRACT

The importance of providing healthy food has become a great concern in agricultural development. The innovation of zoning-based organic farming development is the prospective solution not only to increase the production capability of healthy food but also to improve the quality of land and the environment, as well as to increase business efficiency and improve agricultural product prices. The development of zoning-based organic farming is also in line with the national policy in agriculture, namely the corporate-based agricultural zoning approach. Apart from that, the development of organic agriculture must be an upstream-downstream approach so that an integrative management system is strongly needed, starting from on-farm processing to marketing of the organic products. The implementation of zoning-based organic farming management will involve many related stakeholders, especially farmers, farmer groups, cooperatives, affiliated local government agencies, and business partners. This approach certainly requires a clear legal basic support related to the organic agriculture zoning so that the sustainability of organic farming can be appropriately maintained. Therefore, the idea of making District Head Regulation (called *Peraturan Bupati*) the legal protection for the management system for organic farming zoning is the right choice. Thus, if the design of this governance model can run well, then the hope that the zoning-based organic farming approach will improve the welfare of farmers may come true.

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## I. INTRODUCTION

Management innovation in the provision of healthy food is very important considering the massive application of chemical pesticides used by farmers, which will endanger the health of people who consume the agricultural products. An increase must also follow healthy food production in the welfare of farmers and a sustainable agricultural system. The idea of organic farming is the answer to solve this problem. Organic farming has proven to be more productive in the long term than conventional farming. However, it still needs to be emphasized again about what kind of organic farming development model should be implemented appropriately.

The experience of developing organic agriculture in various places in a scattered pattern provides important lessons (lessons learned) on the emergence of barriers to standardization of production processes and the quality of agricultural products, as well as barriers to production effectiveness and efficiency. Łuczka & Kalinowski (2020) argue that scattered land conditions cause low production capacity and obstacles to the effectiveness and efficiency of organic agricultural production.

A previous study by Irham et al. (2020) showed that organic farming in Sleman Regency was carried out in various farmer groups scattered in relatively small areas, reducing farming efficiency and increasing certification costs for each organic farmer group. Therefore, the determination of organic farming areas needs to be realized to improve farming efficiency and ensure the sustainability of the organic farming system. The development of zoning-based organic farming is based on several justifications, including (Devi et al., 2021; Irham et al., 2020; Nurhayati et al., 2020; Nurhayati & Irham, 2020; Wirakusuma et al., 2019): (1) As a sustainable agricultural system (ecological, social, and economic multiplier effects), (2) Having a higher selling price (premium), (3) Efficient use of inputs, (4) high export opportunities to other countries, (5) opportunities to improve farmer welfare, and (6) development of a farm record system as part of a modern farming system will be easier to implement the organic zone as management innovation system

becomes attractive as a strategic solution in producing healthy food, as well as improving the quality of land and the environment as well as improving the welfare of farmers through increasing food production, increasing business efficiency, and improving food prices. Organic farming is technically more efficient if it is carried out by recommended organic practices and is carried out within an area. In zoning-based development, the process of coordination, synchronization, and integration between components and processes or stages of organic farming can be managed better. In addition, various related services such as agricultural extension and farmer guidance, certification, and product marketing will be more effective and efficient.

From a management point of view, an organic zone will facilitate better organic farming management. Referring to SNI Organic Year 2013, organic farming demands a barrier with non-organic (conventional) areas around it. The dividing line can be in the form of a ditch or plants that are also managed organically. The organic area will make it easier for farmers to determine the organic zone because the location of organic land is not in the form of parcels. The determination of this agricultural area is needed to facilitate the growth and development of agribusiness-based agricultural zone starting from the provision of production facilities, cultivation, post-harvest processing, and marketing as well as supporting activities in a coordinated, integrated, and sustainable manner.

However, the process of an organic farming system requires an effort that is not simple. In Indonesia, to get recognition as a commodity produced through an organic process, it is necessary to have an organic certification issued by an Organic Certification Agency (LSO). The obstacle faced by farmers in conducting certification is the high cost. For this reason, efforts are needed to distribute these fixed costs by forming an organic zone. The zoning-based organic farming system will reduce the cost of certification, which has been a major obstacle for organic farmers, considering that the cost is the same no matter how large a commodity is .

The development of zoning-based organic farming is in line with the national policy in agriculture, namely the food estate approach, which is none other than zoning-based. Apart from that, the development of organic agriculture must be upstream-downstream so that an integrative management system is needed, starting from on-farm, processing, to downstream of organic products. The implementation of organic area management will involve stakeholders, especially farmers, farmer groups, farmer groups, cooperatives, related local government agencies, and business partners managing the area. The condition of a system like this certainly requires clear legal protection. Legal certainty regarding the organic zone is expected as an effort to remain sustainable organic agriculture. Therefore, the idea to produce a Regent Regulation (*Peraturan Bupati/PERBUP*) as a legal basis or legal protection for the management system of organic farming zones then became an option.

Thus, if the design that has been carried out can work well, then the zoning-based organic farming management model is expected to improve the welfare of farmers sustainably in producing healthy food. This study aims to: (1) describe the current condition of organic agriculture in Sleman, (2) justify the importance of zoning in the development of organic agriculture, and (3) formulate an innovative management system model for zoning-based organic agriculture management in terms of governance, institution and regulation.

In addition, to pay strong attention to innovative management systems or models for zoning-based organic agriculture management, it is also important to deeply understand the framework and critical situation of the Indonesian rice industry. The problems and challenges faced by the Indonesian rice industry are quite complex covering aspects of resources, access to innovation and governance as well as human resource capacity of the governmental apparatus and farmers. Subejo (2022) identified problems and challenges related to rice industry development, including the average ownership and management of small rice fields of less than 0.3 ha per farm family. The other problem is the scattered location of farming land so that the production

efficiency is low. Access to innovation, irrigation services and financing is also very diverse where in Java Island it is quite good but outside of Java is relatively less favorable. The human resource capacity of the governmental apparatus related to farming services and producer farmers is also very varied where some of the agricultural extension officers are old. On the farmer's side, the farmer regeneration process is also not going well.

A study on the competitiveness of the rice industry in Asia has been reported by Bordey et al. (2016). In general, Indonesian rice production is less efficient and less competitive with a small-scale business. Indonesia's average rice land ownership is below China, India, and Vietnam. The proportion of ownership of tillage tractors is also below that of Thailand, India, and the Philippines. Irrigation services for agricultural land managed by the government in Indonesia are still below China, Thailand, and Vietnam. The proportion of farming capital originating from credit in Indonesia is also below the Philippines, Thailand, and India. On the other hand, the use of N, P, and K fertilizers are higher than in Vietnam, Thailand, India, and the Philippines. The use of agricultural labor in Indonesia per ha is also higher than in Vietnam, Thailand, India, and the Philippines. From the aspect of human resources, the proportion of farmers who have attended agricultural training in Indonesia is also relatively low, lower than in China, Vietnam, Thailand, and the Philippines. The average cost of rice production in Indonesia is higher than that of China, India, Vietnam, Thailand, and the Philippines.

The great concern is not only on the challenges of the Indonesian rice industry in the broader perspective but also in developing organic rice farming. Some problems and challenges are also being faced in developing organic farming. A study by Sujianto, Gunawan, and Datta (2020) has identified the essential challenges for organic rice farming in Indonesia. The first challenge is adopting Good Agricultural Practices (GAP) to produce excellent quality rice. On another side, organic rice farming also should mitigate the adverse effect on the environment. Some technical constraints were also found, such as

limited organic fertilizer, difficulties preventing contamination of water, and the cost of organic certification. The domestic organic fertilizer is still not enough for national consumption. Farmers should make their fertilizer from compost, dung, green manure, and active microorganism. Farmers have a minimum of government endorsement and scaling up an opportunity. The issue of how organic rice could produce high yield and quality and at the same time could mitigate emissions in all cultivation processes is also a substantial challenge. The challenge faced is also linked with market issues and consumer behavior constraints. Even though the market demand for organic rice is increasing, the consumers still assume that organic rice is expensive due to buyer power parity.

## II. ANALYTICAL FRAMEWORK

The concept of sustainable agriculture refers to the use of all resources to produce agricultural products (food and its derivatives), to provide for the needs of the present, and to ensure that future generations' needs are met. This provides an understanding that the use of resources should not be carried out in an exploitative manner. Especially in the farming system, the process of plant cultivation is closely related to the existing ecosystem. In the cultivation process, it must pay great attention to the balance of the ecosystem in a sustainable manner. It is not allowed to manipulate the resources by eliminating existing natural elements and replacing them with new ones in large quantities. Currently, the agricultural sector's development and fulfillment of food needs are increasingly leading to healthy and sustainable agriculture that maintains a balance with environmental conservation. One of the healthy, environmentally friendly, and sustainable agricultural technologies is organic farming. Charina, Kusumo, Sadeli, & Deliana, (2018) explained that organic farming is one of the types of agricultural systems which is the implementation of a sustainable farming system.

Organic agriculture is an agricultural production system that supports the health of soil, ecosystems, and people. It more relies on ecological processes, biodiversity and cycles adapted

to local conditions, rather than using chemical inputs with adverse effects. Organic Agriculture combines local tradition, innovation, and science to provide environmental benefits and good quality of life for all involved (IFOAM, 2005).

Susanto (2002) and Samun, Rukmana, & Syam (2011) stated that some agricultural experts in the western countries conclude that the organic farming system is the law of return, which means a system that seeks to return all types of organic matter to the soil, in the form of crop waste or waste of livestock/manure to feed the crops. Astuti, Sudarsono, Sulaeman, & Syukur (2016) explained that the basic concept of organic farming is a method of crop production by avoiding or as much as possible preventing the use of synthetic chemical compounds (fertilizers, pesticides, and growth regulators).

Yuriansyah, Dulbari, Sutrisno, & Maksun (2020) in his research revealed that the basic principles of organic agriculture include (1) keeping the ecosystem healthy, (2) applying the principle of efficiency to the cultivation system, (3) carrying out production activities with the concept of sustainable agriculture, (4) producing a pesticide-free product, and (5) preserving the environment. Suparta & Kartini (2001) explained that in the development of organic farming systems there are several principles, one of which is a healthy ecosystem through (a) optimizing the empowerment of natural resources, (b) using environmentally friendly materials, (c) increasing ecosystem diversity; and (d) crop rotation. The second principle is to apply eco-efficiency principles such as (a) minimization of tillage, (b) eliminating the use of synthetic materials originating from outside the ecosystem (low external input). The third is to build a decision-making system (commodity selection and use of inputs) based on the results of the analysis of agricultural systems (agroecosystems) and markets. Another principle is to establish sustainable production, produce food ingredients free of toxins (pesticides), and ensure environmental sustainability. Conceptually the organic farming system developed must have ecological, economic, social, and conceptual stability to get support from policymakers, especially those related to produc-



tion facilities, technology, price incentives, and market opportunities for the products produced.

Organic farming avoids genetically modified seeds or seedlings. Fertilizers and pesticides used are derived from organic materials. The water source is cultivated as a source pure, clean, free of contamination or does not pass through non-organic cultivation areas. When passing through non-organic land, efforts must be made to neutralize input contamination from non-organic cultivation. Organic farming is not recommended using herbicides or other chemicals. Methods of controlling pests or diseases in organic farming use varieties resistant to pests and diseases, biological control (increasing natural enemy populations), and land management (management). There is Integrated Pest Management (IPM) which incorporates ecological and economic factors into agricultural system design and decision making and responds to community concerns regarding environmental quality and food safety. In addition, there is pest control in organic farming based on the concept of Organic Integrated Pest Management, namely good integrated pest control based on healthy soil (Astuti et al., 2016).

Organic agricultural production and organic food sales have grown rapidly (Alotaibi et al., 2021). A fairly high price appreciation compensates organic agricultural products. In the current market, organic rice has a price of 50 to 125% higher than the price of ordinary rice (Astuti et al., 2016).

Even though some reports on organic farming development highlight positive impacts, still various obstacles face in organic farming development. As reported by Łuczka & Kalinowski (2020), the common condition of the scattered land of organic farming practices causes low production capacity as well as barriers to the effectiveness and efficiency of organic agricultural production. The solution to various obstacles and problems due to the scattered structure of organic farming businesses is to develop zoning-based organic agriculture. In zoning-based development; the process of coordination, synchronization, and integration between components and processes or stages of organic farming can be managed better. In addition, various related services such

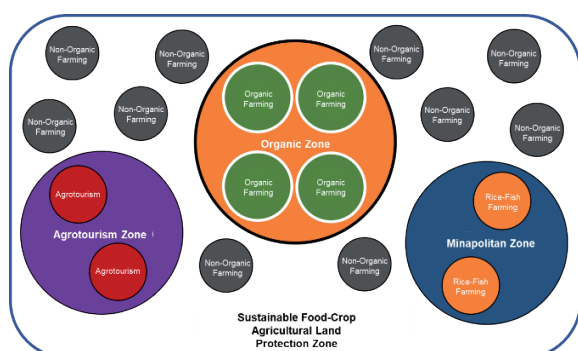
as agricultural extension and farmers' guidance, certification, and product marketing will be more effective and efficient.

The development of organic agriculture in a scattered pattern is also found in Sleman Regency, Special Region of Yogyakarta Province. A previous study (Irham et al., 2020) showed that, in Sleman Regency, organic farming was carried out in various farmer groups scattered in relatively small areas, thereby reducing farm efficiency and increasing the cost of certification for each organic farmer group. Therefore, the determination of zones or areas for organic farming needs to be realized to improve farming efficiency and ensure the sustainability of organic farming systems. The results of intensive discussions with the Department of Agriculture, Food and Fisheries of Sleman Regency confirmed the need for a regulatory scheme that can be used as the basis for the formation as well as the legal basis for the establishment of the organic farming zone in Sleman Regency. The organic farming zone must also be designated as part of the Sleman Regency spatial plan. With the establishment of zones or areas for organic agriculture and supported by appropriate policies and regulations, it is hoped that the organic farming system in Sleman Regency can economically achieve high efficiency.

The existence of this organic zone requires a clear legal certainty. Legal certainty regarding an organic area is expected to be an effort so that organic farming can continue. Organic farming is technically more efficient if it is carried out by recommended organic practices and is carried out in an organic area with legal certainty. Farming Land Protection for Sustainable Food (widely known as PLP2B) is one of the policies in the zoning-based agriculture sector in Indonesia. The basis of all laws and regulations regarding PLP2B is Law No. 41 of 2009 concerning the Farming Land Protection for Sustainable Food. The PLP2B Law covers the following matters: 1) the principles and objectives of the PLP2B implementation; 2) a series of PLP2B which includes planning and determination, development, research, utilization, development, control, supervision, protection, and empowerment of farmers; 3) PLP2B information system; 4) financing and 5) community participation.

Zoning-based agricultural development began to be developed in 2012 through the Minister of Agriculture Regulation (PERMENTAN) No. 50 of 2012 concerning Agricultural Areas as a combination of agricultural centers that are functionally related to land, geography, agro-climate, infrastructure and institutions as well as human resources. Physically the land must support the development of leading commodities; geographically it must be in a strategic area; agro-climatically supported by climatic and weather conditions; infrastructure must be suitable such as access to transportation; institutionally can be a facilitator for the development of human resources (farmers) in the context of developing leading commodities. Then this regulation was refined by Minister of Agriculture No. 56 of 2016 concerning Guidelines for the Development of Agricultural Zone supported by the Master Plan prepared by the Regional Government.

Then again the Minister of Agriculture Regulation No. 18 of 2018 was issued concerning Guidelines for the Development of Farmers' Corporation-Based Agricultural Zone. In the Ministerial Regulation, it is stated that the Regional Government is obliged to prepare the Agricultural Zone Master Plan Document based on the Farmers Corporation. The existence of this document is expected to provide direction for planning agricultural areas in line with national and provincial policies in a directed, integrated, measurable manner supported by the necessary facilities and infrastructure.



**Figure 1.** Organic Agriculture Zone as Part of PLP2B Area

At the provincial level, Yogyakarta Special Region already has the Regional Regulation Number 10 of 2011 concerning PLP2B. Specifically for the development of organic agriculture in Sleman Regency, it is supported by the Regional Mid-term Development Plan (RPJMD) 2016-2021 of Sleman Regency concerning Organic Agriculture and Rice-fish area (*Mina Padi*) (Figure 1). With the existence of regional autonomy, regional administration can make its own rules regarding the management of areas or organic agricultural land. This rule is necessary for the following reasons. First, the determination of the area or organic agricultural land is included or mentioned in the detailed spatial plan of the Sleman Regency. The area of organic agricultural land will be part of the sustainable food agriculture area. The second is the management of organic farming areas. In this case, a District Head Regulation is needed to emphasize the need for a separate management model for organic agricultural areas or lands that will distinguish them from other land or zoning contained in sustainable food agriculture areas. Separate management is needed to ensure that organic agricultural areas or lands can play their specific functions, namely in addition to supporting the achievement of food security and sovereignty, as well as maintaining sustainability.

In addition to the absence of a particular zone or area for organic agriculture that is supported by government regulations in the Sleman Regency, there is also no management model for the development of organic farming areas. The development of zoning-based organic farming requires the support of a governance system based on the principles of good governance characterized by transparency, participation, accountability, and coordination. Therefore, this study seeks to initiate the formation of organic areas that are legally regulated by regulations and to design appropriate policies and governance monitoring to support the creation of organic farming areas to the availability of healthy food and sustainable organic farming systems.

The design of the organic rice development model in Sleman Regency seeks to integrate macro, meso, and micro aspects which are represented by a policy, institution, and operation. Although the basic design can be defined

theoretically and conceptually, however, it has limitations if there is a diversity of commitments between involved parties related to the development of organic agriculture. It requires a strong commitment and support from the regional leadership of Sleman Regency, which is then realized in adaptive institutional support and is applied in operations in the field with well standardized operational procedure guidelines to ensure the process will run well and produce competitive and high-quality organic products. The compliance of all stakeholders involved in standard procedures and innovative creativity that the competitive organic rice products will be a determining factor in the design of the basic framework for the development of regional-based organic agriculture in Sleman the Regency.

## II. METHODOLOGY

The data used in the study are based on primary and secondary sources through quantitative and qualitative approaches. Primary sources consist of respondent farmers and the Office of Agriculture, Food and Fisheries of Sleman Regency, while secondary sources come from formal legal documents. This collection was conducted in Cangkringan and Pakem Subdistricts, Yogyakarta in 2021. Pakem and Cangkringan subdistricts are geographically close to each other and are included in the organic agriculture development area according to the regional development design of the Sleman Regency. Topographically, these two areas are relatively close to water sources, making them suitable for the development of organic farming areas. In particular, this study aims to explore the condition of organic farming in the Sleman Regency, determine farmers' responses to the importance of organic zone zoning, and design innovations in area-based organic farming management.

The field survey involved 121 farmers in the two research districts. Respondent farmers were also the subject of in-depth interviews. In addition, data were obtained through a Focus Group Discussion (FGD) involving agricultural extension workers in Pakem and Cangkringan Subdistricts, the Regional Planning and Development Agency (BAPPEDA), the Spatial Planning

Office, the Study Team for the Protection of Sustainable Food Agricultural Land (PLP2B) in Sleman Regency, and the officers of the Office of Agriculture, Food and Fisheries of Sleman Regency. Comparative studies were also conducted to explore deeper information on best practices of organic farming development. In detail, the various data collection techniques and research subjects are presented in Table 1.

**Table 1.**

Data collection techniques and research subjects

Data collection technique	Subject of Research
Field survey	In-depth
In-depth interview	Field Agricultural Extension (PPL) and farmer group administrators
Comparative study	Boyolali organic rice farmers' association (APPOLI Boyolali, Central Java)
Focus Group Discussion (FGD)	Relevant Regional Apparatus Organizations (OPD) in Sleman Regency and agricultural extension workers

Qualitative research analysis was used in this study. Three lines of qualitative data analysis were employed according to Miles, Huberman, & Saldana (2014), covering: (a) Data reduction, namely the selection process, focusing attention on simplification, abstracting and transforming rough data, (b) Presentation of rough data, namely presenting data which has been reduced and compiled the data to help conclude, and (c) Concluding.

## III. RESULTS AND DISCUSSION

### A. Governance of Organic Agriculture Development

The macro problems identified in the study of organic agriculture development in Sleman Regency include: (1) organic agricultural cultivation lands are generally on a small scale with scattered conditions, (2) the governance model is still weak and has not been oriented to the integration of sustainable production and economic benefits, and (3) the development of organic agriculture

has not fully integrated with the mission of providing healthy food for the community. The obstacles and problems in the development of organic agriculture caused by the places or lands of organic agricultural production being scattered in the two study locations in Sleman Regency are in line with the findings of Łuczka & Kalinowski (2020) which show that the condition of the scattered land causes low production capacity as well as barriers to the effectiveness and efficiency of organic agricultural production.

In addition to the problem of the condition of scattered organic agricultural production lands, the governance of organic agriculture developed in Sleman Regency is still weak so it has been fully able to guarantee the standardization of organic products and the institutional structure of the manager is still not stable. This condition is also in line with the findings of Łuczka & Kalinowski (2020) who have identified weak organic farming governance and institutions which are also strategic issues and problems in developing organic agriculture. Weak governance and unsteady institutional structures and roles will make it difficult to implement standardization of production processes and guarantee the quality of organic products as well as barriers to better market access and expansion of cooperation networks.

Based on the results of field surveys in-depth interviews and FGDs with related parties, the integration of the objectives of organic agriculture development in Sleman Regency is still poor. Profits or economic benefits are still a very dominant orientation in the development of organic agriculture. The condition of the orientation of the development of organic agriculture that has not been integrated is confirmed with the general condition of the development of organic agriculture as documented in the UNEP (2011) on organic agriculture which illustrates the still very strong orientation on economic incentives in the development of organic agriculture.

Based on field findings and the relevance of theoretical frameworks and perspectives, it seems that to realize the development of integrated organic agriculture with multi-aspect benefits in Sleman Regency, it is necessary to develop

a zoning-based organic agriculture development model with adequate governance and institutional support and integrate economic functions with the function of guaranteeing the provision of healthy food for the community and food security.

In summary, the problems and existing conditions of organic agriculture development in Sleman and the urgency of the introduction of new governance in the development of organic agriculture in Sleman Regency are presented in Table 2.

**Table 2.**  
Existing Conditions and Urgency of Organic Agriculture Development in Sleman Regency

Governance Aspects	Existing Condition of Organic Farming in Sleman Regency	Governance Model that needs to be development
Organic cultivation pattern	Small scale and scattered	Developed in the region (zoning system)
Organic production orientation	Main orientation on economic benefits (profits)	Integrating economic benefits, sustainable production, and providing healthy food for the community
Organic farming governance	Management standardization has not been implemented properly and organic farming institutions have not been established	Development of good governance and institutions concerning the principles of good governance

Source: Primary data survey, 2021

From the meso and micro perspective, problems faced in the development of the organic rice industry in Sleman Regency and other rice-producing areas in Indonesia can be grouped, namely small-scale farming, high use of fertilizers, high labor allocation, limited working capital, uncompetitive product prices and low capacity of human resources which include agricultural extension officers and farmers.

The small scale of farming land and business can be overcome by introducing the innovation on collective management of agricultural land that can be managed by farmer groups and the excess on-farm workforce can be directed to

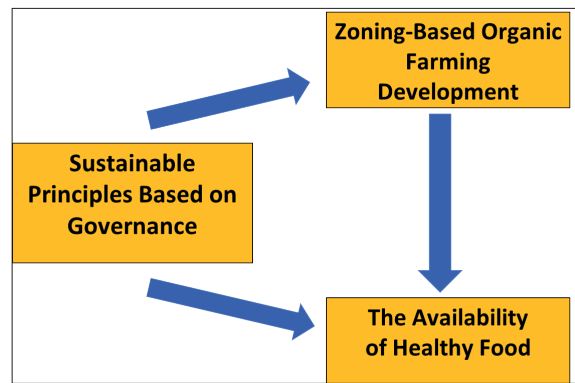


process various agricultural products and services related to agriculture in rural areas. The high use of fertilizers can be overcome by the use of local raw materials such as compost and manure which are processed properly into quality organic fertilizers. In the aspect of labor allocation, if the business scale of the group is large enough, it can be efficiently combined human labor with agricultural machinery. To get higher the rice of organic products, prospective innovation can be promoted through organic rice groups or associations, creating direct marketing to potential buyers or consumers and making networks with particular parties.

Meanwhile, to increase business the capacity of organic farming, financial support through various rural and agricultural credit schemes can be strengthened by various state-owned banks and local governments. Strengthening the capacity of the governmental apparatus and farmers can be done through training, internships, and comparative studies involving government agencies, universities, and NGOs. In addition, the effectiveness and efficiency of disseminating innovation and information related to the development of organic agriculture need support by the innovation in the form of application of information systems such as farm record applications that allow the process to run quickly, broadly, and flexibly.

Substantial main aspects in strengthening the prospective future organic farming development model in Sleman Regency include (1) zoning-based organic agriculture development, (2) application of good governance principles, and (3) providing orientation to the provision of healthy food. Broadly speaking, the relationship between the three key aspects in the development of organic agriculture is conceptually presented in Figure 2.

To realize the development of sustainable zoning-based organic agriculture with the orientation of being able to ensure the availability of healthy food for the community, a good governance model is required. The urgency and significance of good governance in agricultural development have been advocated by Juvvadi (2014) who states that in general governance is defined as the way a system or organization

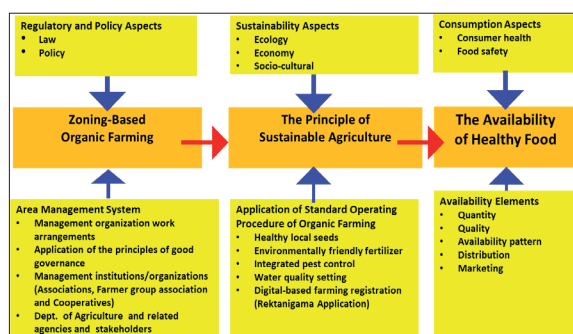


**Figure 2.** The interrelationship of the three key aspects in the development of organic agriculture in Sleman Regency

is guided and directed. Good governance is an important input for economic growth and sustainable development at all levels and in all sectors of administration and society including the agricultural and farming sectors. Agricultural Governance is concerned with enhancing the growth and development of agriculture and related sectors and managing the process through effective institutional functioning, application of technology and scientific innovation, providing services and support, implementation of policies, and compliance with applicable laws or regulations. Good governance in agriculture is important to formulate a conducive policy environment and implement various related policy agendas more effectively.

Good governance is very important to realize the development of organic agriculture with principles that refer to sustainable agricultural development. Juvvadi (2014) synthesized eight important steps or strategies to realize the governance of agriculture and related sectors that require multi-sectoral support, namely: 1. Strengthening agricultural input systems, 2. Expanding irrigation services quickly, 3. Improving rural infrastructure, 4. Increasing education, agricultural research, and development, 5. Improving soil health and bridging yield gaps with existing technologies, 6. Using information and communication technologies (ICTs) and other enabling technologies, 7. Building farmer capacity to meet emerging challenges and 8. Governance for strengthening partnerships and

scale agribusiness and industry. Broadly speaking Based on the analysis, the framework and components of zoning-based sustainable organic agriculture governance in supporting the availability of healthy food for the community that needs to be developed in Sleman Regency are presented in Figure 3.



Source: based on FGDs Analysis

**Figure 3.** Framework and components of zoning-based sustainable organic agriculture governance in supporting the availability of healthy food

Zoning-based organic farming will have a strong and strategic position and ensure sustainability if it is supported by relevant laws and policies. In 2020 Sleman Regency has ratified a Regional Regulation (called PERDA) related to Sustainable Agricultural Land as stated in the Sleman Regency Regional Regulation No. 6 of 2020 concerning the Protection of Sustainable Agricultural Land (PLP2B). PERDA PLP2B can be used as the main legal protection for zoning-based agricultural development. In the context of the development of organic farming areas and their governance model, they are currently in the process of drafting the Sleman Regency Regent's Regulation (called aturan Bupati or PERBUP). Operationally, regulatory and policy support needs to be supported by a solid regional governance system which includes working arrangements for managing organizations, application of good governance principles, structuring of management institutions, and consistent support from relevant stakeholders, including the Department of Agriculture, other technical related departments and the other related stake

The development of zoning-based organic farming underlies the principles of sustainable ag-

riculture. Conceptually and need to be realized in program operations, the principles of sustainable agriculture must meet the ecological, economic, and socio-cultural aspects of sustainability. Operationally, sustainability assurance can be carried out with strict implementation through organic farming standard operating procedures (SOPs) which include healthy local seeds, environmentally friendly organic fertilizers, integrated pest control, water quality regulation, and digital-based farming records (*Rektani Gama*).

The output of the implementation of the zoning-based organic farming development model that applies the principles of sustainable agriculture is the availability of healthy food for the local community could cover a broader area if the amount of production considerably over the local demand. Indicators of the availability of healthy food can be seen from the consumption aspect which includes consumer health and food safety. In addition, it can also be operationalized from the element of guaranteeing food availability which includes quantity, quality, the pattern of availability, distribution, and marketing of products.

The development of an organic agriculture zone initiated in the Sleman Regency is very prospective to overcome various problems typically faced by the Indonesian food agriculture sector and especially the development of organic agriculture. Through the support of policies and regulations that are the operational basis for organic agriculture development and facilitated by adaptive institutions that accommodate guarantees of product stability and increased income of producer farmers, the opportunity for strengthening the competitiveness of organic agriculture will be even greater in the future.

A study on the competitiveness of the rice industry in Asia has been reported by Bordey, Moya, Beltran and, Dawe (2016) showing that in areas that develop rice in the high-yielding season, rice productivity in Indonesia is quite good (5.42 tons/ha) although still below the average productivity of Vietnam (6.33 tons/ha) and China (6.10 tons/ha). The average Indonesian rice productivity is better than the average in Thailand, India, and the Philippines.

The development of zoning-based organic agriculture that integrates upstream to downstream aspects is very prospective to overcome the problems of small-scale businesses, wasteful labor, low access to capital, poor human resource capacity, and product prices that are less attractive for producer farmers.

Utilization of various local raw materials, more efficient use of labor and machinery, open access to business capital and improvement of technological innovation-information access, and better price incentives for organic products will be important factors to increase organic rice productivity. The study of organic rice in Central Java and Yogyakarta by Devi et al. (2021) showed the highest productivity in the Pakem area of Yogyakarta Province reaching 7.5 tones/ha and in the Sawangan area of Central Java Province reaching 8 tons/ha. This shows that if organic rice farming can be managed properly following standard procedures and supported by various appropriate conditions, it will be able to achieve high productivity exceeding the average rice production in Vietnam.

## **B. Institutional Development of Organic Agriculture**

The development of economic community-based institutions needs to adapt to the trends of contemporary global economic development whose principles do not only concern the production process but also include the institutional design. The Nobel Prize winner in Economics, Douglas North (1990) noted that in recent decades various groups have increasingly realized that the success of development, including agricultural development, is not only related to the success of building techno production innovation but the success of the development is closely related to the performance of institutions of the whole series of agricultural development activities. The important role of institutions is to facilitate the process and smooth economic transactions in development.

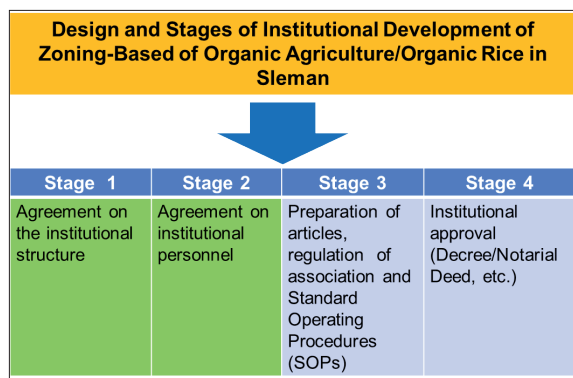
The design of economic community-based institutions needs to be designed to be able to play the significant roles and functions of economic institutions which include: (1) guaranteeing own-

ership rights and access rights for the members involved, (2) facilitating transaction processes between members and other related parties, and (3) encouraging cooperation economy and organization. The basic capabilities and prerequisites of economic institutions are in line with the concept of “economic institutions” developed by Wiggins & Davis (2006).

The concept and design of economic community-based institutional development are in line with and very relevant to the new movement in the economic field called the New Institutional Economics (NIE). Economic community-based institutions are not only focused on aspects of business and economic transactions but also give strong attention to the process of social transactions that accompany economic transactions. Yustika (2013) states that the condition or social structure is one of the factors that affect the economy, the development of the economic world is also always influenced by social conditions, followed by the surrounding institutions. Certain social and institutional conditions or institutions can always condition economic development directly or indirectly.

Based on the results of FGDs, field observations, and in-depth interviews; technically, the development of zoning-based organic farming institutions in Sleman Regency was designed in several stages which include: (1) institutional structure agreement, (2) institutional personnel agreement, (3) preparation rules of the game (the basic articles/AD and internal rules/ART of organizations) and (4) institutional approval. The procedures and stages of zoning-based organic farming institutional development in Sleman Regency are presented in Figure 4.

Strengthening community economic institutions is an effort to build mutual commitment, and motivate members to be self-reliant and not rely on the help of other parties. With the concept of this institution, it is hoped that public awareness will invest independently. Another thing related to the Institution concept is that it facilitates the establishment of program synergies from various ministries and local governmental agencies. Economic community-based institutions are not only focused on economic empowerment but are



Source: based on FGD Analysis

**Figure 4.** Zoning-Based Organic Agriculture Institutional Stage Procedure

followed by social and community development that upholds the value of rooted local wisdom (Subejo, 2016).

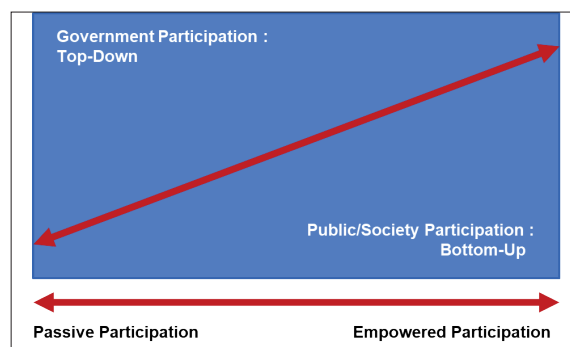
The analysis of the design and performance of economic institutions documented by Subejo (2016) describes the success story of pioneering the socio-economic institutional model of the community which shows the success of the integration model that combines the social and economic interests of the community.

The success of economic community-based institutions that accommodate two orientations (economic and social) is in line with the theoretical framework developed by Kirchler, Fehr, & Evans (1996) and Palameta & Brown, (1999) which states that a community activity will survive if it can accommodate social interests (homo socius) and economic interests (homo economicus) which is embodied in the integrated concept of the socio-economic interests of the community (homo socio-economic development of zoning-based organic agriculture in Sleman Regency, it is necessary to develop community economic institutions that can open barriers to the interests of individual farmers and groups at the village level or inter-village as well as the ability to mobilize local resources and open space for support and facilities for government programs through regional apparatus organizations is an effective mix of bottom-up and top-down strategies. The dynamics and existence of community economic institutions can also show the level of community participation that is getting stronger

towards empowered participation as conceptualized by Servaes (2008). The position of economic community-based institutions in the dynamics of the relationship between the role of government and public initiatives is already in a position of stronger participation (Figure 5).

The combination of the balance of economic community-based institutional orientation in the development of zoning-based organic agriculture in Sleman Regency is a combination of the economic and social interests of the community members of the organizations involved with the principle of ensuring the sustainability of agricultural businesses can be described in Figure 6. The social interests of farmer group members in the form of farming protection remain an important concern, but on the other hand, it is necessary to develop an institutional component that has a commercial orientation to encourage the creation of high added value to provide greater economic benefits for the farmer members of the organization.

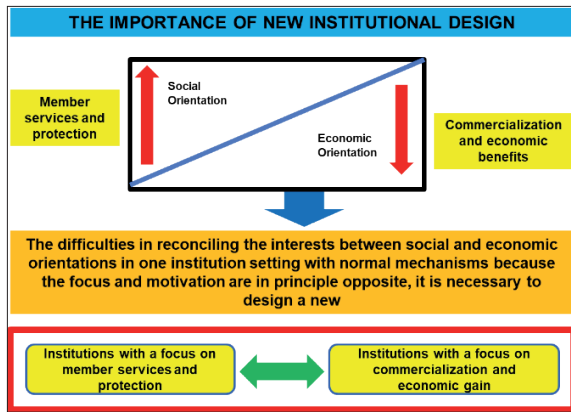
One of the important considerations in institutional management is identifying and utilizing existing institutions in the community and proven effective. Revitalization can be done by strengthening the capacity of human resource managers, structuring and strengthening institutional structures, structuring work procedures and monitoring, etc. The economic function of organic farming institutions that can be formed in cooperatives can be part of organic farming institutions that are members of the Association of Merapi Mt Slope Organic Farmers. The structure and work pattern of organic farming institutions can be depicted in Figure 7.



Source: Subejo (2021)

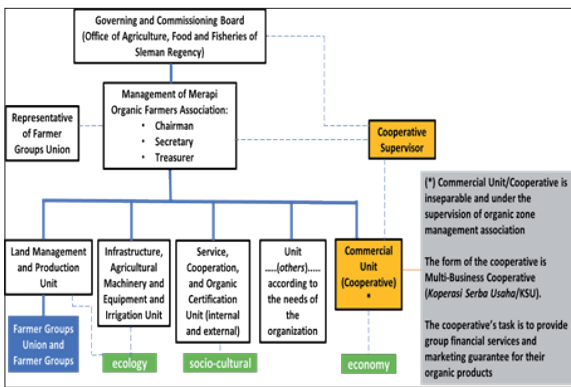
**Figure 5.** Dynamics of Government and Public/Society Participation Relations





Source: based on FGD analysis

**Figure 6.** Combination of Community Economic Institutional Orientation Balance



Source: based FGD Analysis

**Figure 7.** Proposed Structure and Work Patterns of Zoning-Based Organic Agriculture Institutions

### C. Legal Aspects of Organic Agriculture Development

An innovation management system in the management of zoning-based organic agriculture requires the support of legal aspects in addition to governance and institutional aspects. The preparation of a policy document in the form of a District Head Regulation related to the determination of organic farming areas and their instruments is expected to provide legal guarantees as well as various other facilities from the government for the community in general and farmers in particular. This policy instrument makes a real effort to realize a zoning-based organic farming area with excellent management to ensure the availability of healthy food and also increase the welfare of farmers in Sleman Regency. This legal

document was prepared with the idea of spatially the organic agricultural area or in a sustainable food agriculture area. The idea of developing the concept of an organic agricultural area is legally influenced by several regulations governing the management of sustainable agricultural land and agricultural areas.

The development of zoning-based agriculture has also become an important concern for the Ministry of Agriculture of the Republic of Indonesia. Since 2009 a regulation has been issued that regulates the provisions for zoning-based agricultural development. In the Regulation of the Minister of Agriculture Number 41/Permentan/OT.140/9/2009 concerning Technical Criteria for Agricultural Designated Areas, it is explained that the determination of this agricultural designation area is needed to facilitate the growth and development of agribusiness-based agricultural areas starting from the provision of production facilities, cultivation, post-processing, harvesting and marketing and supporting activities in an integrated and sustainable manner.

Meanwhile, related to the concept of sustainable agriculture, the Sleman Regency Government's policy regarding PLP2B has made sustainable food agriculture one of the development targets in agriculture (formally stated in document of RPJPD) through Sleman Regency Regulation Number 6 of 2020. The scope and discussion in the PLP2B Regional Regulation of Sleman Regency are no different from the Yogyakarta Special Region Regulation No. 10/2011 on PLP2B. These two regional regulations were made to implement the laws and regulations made by the central government.

The basic reference of all laws and regulations regarding the protection of LP2B is Law Number 41 of 2009 concerning the Farm Land Protection for Sustainable Food (UU PLP2B). This law itself has used the 1945 Constitution, Basic Agrarian Law (UUPA), and Law Number 26 of 2007 concerning Spatial Planning as the legal basis. About the Constitution, the PLP2B Law relates itself to several provisions regarding human rights and the right to control the state. PLP2B is associated with the fulfillment of citizens' human rights to obtain a decent living

(article 27 paragraph 2), maintain life and livelihood (article 28A), and maintain their quality of life (Article 28C paragraph 1). This law is also related to the right to control the state because it regulates the protection of land that functions as PLP2B. The land itself is the main element of agrarian resources. Although it has been designed in such a way, the PLP2B document has not specifically regulated the determination of Organic Agriculture zones. This later became a turning point for the importance of supporting legal aspects through the establishment of the Sleman Regent's Regulation which regulates the determination and management system of organic agricultural zones.

#### IV. CONCLUSION

The conclusion of this study is as follows:

- Application of zoning-based organic farming is important in the context of developing a sustainable healthy food system.
- Development of a sustainable zoning-based organic farming system needs to be supported by a governance system based on local needs and characteristics.
- Institutional innovation system is a much-needed aspect in supporting the development of a sustainable zoning-based organic farming management system.
- In the development of a sustainable zoning-based organic farming system, legal support is needed in the form of policies and legal umbrellas contained in the regional regulation (PERDA) and the District Head Regulation (PERBUP).

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