

The Role of Stakeholders in the Development of Organic Rice Agribusiness in Gentungan, Karanganyar

Suminah^{1,*}, Akbarudin Arif¹, Sapja Anantanyu¹, Agus Kristiyanto², Haryani Saptaningtyas¹

¹Department of Development Extension, Graduate School, Sebelas Maret University, Jl. Ir. Sutami 36A, Surakarta, Central Java, 57126, Indonesia

²Department of Sports Science, Faculty of Teacher Training and Education, Sebelas Maret University, Jl. Ir. Sutami 36A, Surakarta, Central Java, 57126, Indonesia

*E-mail correspondence: suminah@staff.uns.ac.id

Received: 28 October 2025 | Revised: 07 May 2026 | Accepted: 24 May 2026 | Online Publication: 29 May 2026

ABSTRACT

Organic farming in Indonesia is promoted more intensively as it benefits economically and environmental conservation. Gentungan Village, Mojogedang Sub District, Karanganyar Regency has embarked on organic rice farming practice since 2009, with many stakeholders' support. This research aims to study the role of stakeholders in developing organic farming in the village, using MACTOR analysis to map each of actors' influence and role and their objective. The result of research shows that the Mentor of Farmer Group has the largest influence, followed with the head of Farmer Group and UNS (University), with the mentor of Farmer Group contributing to coordinating and motivating other actors, while UNS provides training. Central Office of Agricultural Affairs functions as a dominant actor, while the Mentor of Farmer Group and UNS serve as relay actors. Cooperation between the head of Farmer Group, UNS, and the Mentor of Farmer Group indicates strong potency with very low possibility of conflict due to the same objectives.

Keywords: *agribusiness, mactor, organic rice, role, stakeholders*

INTRODUCTION

Agricultural development is an integral part of national development. It is because agricultural sector plays a strategic role as the provider of food, industrial basic material, bioenergy, and job opportunity in Indonesia. Agricultural sector kept growing positively in Covid-19 pandemic era. This growth is supported by various commodities, including organic rice. In the context of extension science, the development of organic farming is viewed through the empowerment paradigm, where farmers are not passive objects but active subjects in the decision-making process. Sadono (2008) emphasizes that agricultural extension has shifted from a transfer-of-technology approach to a participatory empowerment model, requiring the active involvement of various stakeholders to ensure sustainability. However, the success of this empowerment depends on how actors interact. According to data from the Badan Pusat Statistik (BPS) in 2022, Indonesia had 40.64 million workers employed in the agricultural sector. Central Java Province has been on the second rank following East Java Province as the province that can absorb workers in agricultural sector in Indonesia, with 4,608,261 workers. A successful sustainable agricultural development is dependent on the quality of human resource in its commitment to build agricultural sector (Ibrahim & Mufriantje, 2021).

Indonesia is known as rice producer with the first largest rice consumption in the world (Girsang et al., 2021). Rice is an important food commodity with economic value and an opportunity of being developed for its position as staple food to Indonesians, and an important part of national food resilience system (Pratasik & Maulida, 2021). Organic farming is present is a sustainable alternative to conventional farming using an environment-friendly strategy, including the application of organic fertilizer made of manure and plant waste, and plant-based pesticide made of plant and microbial extracts. Organic farming can be described as the form of farming utilizing sustainable natural resource and such strategies as applying plant and animal waste-based fertilizer, controlling pest biologically, and plant rotation (Dur et al., 2020).

Organic farming in Indonesia is promoted continuously as it benefits economically and environmental conservation. The Minister of Agriculture's Regulation about Organic Farming System Number 64/Permentan/Ot.140/5/2013, in Article 1, states that organic farming gives emphasis on the application of management practices prioritizing more the use of input resulting from the waste of cultivation activity in the land by considering the adaptability to local conditions. Organic farming is called "law of return", meaning a system seeking to return the organic material to the soil in the form of organic residues and wastes from farming and animal husbandry as the fertilizer (Rizki et al., 2022).

Gentungan village is in Mojogedang Sub District known widely as one of pioneers in organic rice farming in Karanganyar Regency, Central Java Province since 2009. Farmer group "Mulyo 1" is a farmer group institution driving organic farming from upstream to downstream. The development of organic farming in Gentungan Village needs synergy among farmers, young farmer group, village government, agricultural extensionist, university, Office of agricultural affairs of Karanganyar Regency and other stakeholders.

The Mulyo 1 farmer group has been established for a long time, but it has not yet developed as expected. This presents a challenge for all parties involved in agricultural development. The development of a farmer group is influenced by many factors, including the involvement or role of stakeholders, including agricultural extension workers and related village stakeholders, such as the village government, farmer group associations, farmer group leaders and members, and other relevant institutions. Extension workers as agents of change have the task of acting as a forum for farmers to accommodate the needs of farmers through agricultural extension which is expected to have dominant technical, legitimacy and urgency functions in increasing the development of farmer groups. What are the roles and objectives of each stakeholder involved in developing organic rice farming in Gentungan village?

Stakeholders can be defined as those having distinctive interest and decision, as either individual or group representative (Heryadi et al., 2022). Theoretically, different stakeholders have varying functions and roles to achieve the same objective (Qin et al., 2022). All stakeholders should support the government in developing policies and strategies for developing organic farming (Adil et al., 2022).

The development of an organic rice agribusiness in Gentungan Village, Karanganyar, faces not only technical cultivation challenges but also complex interactions among the actors involved. From a development extension perspective, the success of agricultural transformation depends heavily on how innovations are distributed through effective social networks (Rogers, 2003). However, role imbalances

often occur, hampering program sustainability due to differing interests and the dominance of certain forces.

To examine these dynamics, this study uses Stakeholder Salience Theory (Mitchell et al., 1997) as a theoretical foundation to identify the degree of actor interest based on attributes of power, legitimacy, and urgency. The use of this theory is crucial to complement MACTOR analysis, as it allows researchers to understand why certain actors have a dominant influence on the convergence and divergence of agribusiness strategic goals.

Bram (2022) highlights that Karanganyar Regency has made organic agriculture a priority, continuously innovating in this field. Charina et al. (2018) emphasize that organic farming encourages farmers to pay more attention to environmental aspects, integrating these concerns into every farming activity. Research by Pratiwi et al. (2019) indicates that Desa Gentungan has been a leader in certified organic rice farming since 2011, although the village faces challenges such as the regeneration of young farmers. Furthermore, Wahyuni et al. (2023) discuss the importance of local wisdom and community participation in strengthening both agriculture and cultural tourism potentials in Gentungan, reflecting the need for inclusive and multi-stakeholder collaboration for sustainable development. These studies demonstrate that long-term success in Gentungan's organic farming depends not only on government policies but also on active engagement and cooperation among various community actors and institutions.

The presence of stakeholders can help optimize the expansion of organic land in Gentungan Village and improve the farmers' welfare. The farmers applying organic farming get higher profits because the price of organic rice is more expensive than that of non-organic one. From the perspective of extension science, agricultural development is no longer viewed merely as a linear transfer of technology but as a complex social process involving multiple stakeholders. This study aligns with the participatory extension paradigm, which emphasizes the active engagement of actors as a platform for social learning and innovation diffusion (Sadono, 2008). In this context, the role of extension is not limited to disseminating information but extends to facilitating the convergence of goals among diverse actors—ranging from farmer groups to government agencies. By employing MACTOR analysis, this study contributes to the state of the art in agricultural extension by visualizing how power dynamics and actor alliances (such as Mentors and Universities) function as 'relay actors' to bridge the gap between policy and grassroots implementation, thereby ensuring the sustainability of farmer empowerment programs. Therefore, this research was carried out to find out the role of stakeholders in supporting the development of organic farming in Gentungan Village, Mojogedang Sub District, Karanganyar Regency. Strengthening these collaborations is considered essential for the long-term success and resilience of organic farming initiatives in the region (Triyono et al., 2025).

The presence of stakeholders can help optimize the expansion of organic land in Gentungan Village and improve farmer welfare. Farmers who practice organic farming experience higher profits, as organic rice is more expensive than non-organic. By integrating stakeholder theory into the extension context, this study aims to formulate a strategy for strengthening the role of more inclusive actors to support the independence of organic rice farmers in Gentungan..

METHODS

This research employed mixed methods, a combination of qualitative and quantitative approaches. The location of research was selected purposively, Gentungan Village, Mojogedang Sub District, Karanganyar Regency. Gentungan Village is selected as the research site as it has excellent potency in organic rice farming since 2009. Based on the initial survey of stakeholders involved in the development of organic rice farming, there were 9 research informants including the head of the Mulyo 1 Farmer Group, the mentor of the Mulyo I Farmer Group, farmer cadets, farmer group members, Gentungan Village Farmers, universities, the Gentungan Village Government, Field Agricultural Extension Officers (PPL), and the Karanganyar Regency Agriculture Service.

Data collection was through direct interviews with informants. Then the results of the interviews were presented in a focused discussion on the role of stakeholders with stakeholders (FGD). Data validation in this research was carried out using source triangulations. In addition, researchers also conducted direct observations during group meetings and analyzed documents in the farmer groups.

Data analysis was conducted using Miles and Huberman's interactive analysis and actor analysis was conducted using MACTOR (Matrix of Alliances and Conflicts: Tactics, Objectives, and

Recommendations). MACTOR analysis was used to map the influential actors, the role of actors, and the objective of each actor. This model allowed us to analyze the relationships and influence among stakeholders (Ayu et al., 2025; Makmun et al., 2024). Meanwhile, data validation in this research was carried out using source triangulations.

The scoring procedure in this MACTOR analysis was conducted using the Expert Judgment technique involving nine purposively selected key informants. The scoring process was carried out in two stages: first, the informants completed the questionnaire themselves, and second, score validation through a Focus Group Discussion (FGD) to reach a collective consensus. The scoring scale refers to Godet (2011) and ranges from 0 (no influence) to 4 (very dominant). To ensure objectivity and inter-rater reliability, researchers triangulated sources by comparing perceptions across actors to minimize subjective bias in completing the MDI and 2MAO matrices.

Actor analysis was conducted on the organic rice farming development strategy in Farmer “Group Mulyo 1”, Gentungan Village, Mojogedang Sub District, Karanganyar Regency. The identification of actors’ role is explained below:

The head of Farmer Group “Mulyo 1” (A1). The head of Farmer Group “Mulyo 1” is one of those initiating organic rice farming. He also plays an important role in bridging farmers and extensionists. The head of Farmer Group “Mulyo 1” seeks various positive activities to keep the members of farmer group doing organic rice cultivation vigorously.

Agricultural Extensionist (PPL) of Gentungan Village (A2). The agricultural extensionist is an agent of farmers’ behavior change, through encouraging the farmer communities to change their behavior into the farmers with better abilities who can make their own decision and then will get better life. The agricultural extensionist of Gentungan Village contributes to facilitating the farmers in the development of organic rice and participates in the programs implemented by the farmers to keep the productivity of organic rice improving well.

Mentor of Farmer Group “Mulyo 1” (A3). The mentor of Farmer Group plays many roles in developing Organic Rice in Gentungan Village, Mojogedang Sub District. The mentor of Farmer Group along with the head of Farmer Group “Mulyo 1” initiated the organic rice cultivation. He did it recalling the problem occurring related to the difficulty of finding fertilizers so that organic method is one of solutions that can be taken. The mentor of Farmer Group “Mulyo 1” also becomes the collector of organic rice for rice farmers in Gentungan Village.

Members of Farmer Group “Mulyo 1” (A4). All members of Farmer Group “Mulyo 1” are the farmers who carry out organic farming. The members of farmer group contribute to giving input and expressing opinion in each of activities related to the development of organic rice.

Farmers of Gentungan Village (A5). Gentungan Village farmers support the development of organic rice by carrying out farming activities organically.

Central Office of Agricultural Affairs (A6). Central Office of Agricultural Affairs is a governmental element supporting organic farming and providing direct aid to the farmers through the Farmer Group “Mulyo 1”. The aid is provided in the form of rice milling machines and ovens that can be used by the farmers in Gentungan Village.

Gentungan Village Apparatus (A7). Gentungan Village Apparatus is an element of government that has the authority to administer village government and develop Gentungan Village. Gentungan Village officials play a role in supporting the development of Organic Rice in Gentungan Village by assisting in the form of Tyto Alba bird cages. The Tyto Alba bird or better known as the barn owl, is used to eradicate rat pests in the rice fields.

UNS Higher Education (A8). Higher education is an agent of social change in society in all aspects of life. Higher education contains intellectual candidates who have the ideas, time and energy to make a change in society. UNS Higher Education has several useful programs to improve the development of Organic Rice, including COPK, MBKM, and Matching Fun. Apart from that, UNS also carries out several community development trainings such as training in making organic fertilizer from animal waste which is used as fertilizer in organic rice cultivation.

Taruna Tani (A9). Taruna Tani was formed to answer the challenges of farmer regeneration. Taruna Tani is a forum for young people who want to be more active in the agricultural sector to further develop and be able to increase the potential of existing organic farming. Training and production of organic fertilizer from animal waste is one of the programs that is being actively carried out by members of the

farmer cadets, this is to support organic farming in Gentungan Village and increase the interest of young people in Gentungan Village in the agricultural sector.

Identify the actor's goals; 1) Facilitating organic rice production (O1), 2) Facilitating organic rice marketing (O2), 3) Increasing farmers' knowledge and skills (O3), 4) Providing places to learn about organic rice (O4), 5) Regeneration of millennial farmers (O5). After filling in the actors and objectives, the initial matrix of MACTOR analysis is filling in the MDI (Matrix of Direct Influence) table which describes the influence between actors on other actors in matrix form. Filling in the numbers or scores in the MDI matrix is carried out using Godet's (1991) rules, where the influence of one actor on another is calculated based on a score from 0-4. The level of influence of actors on each other is measured with the values 0 (no influence), 1 (influence operational procedures), 2 (influence work), 3 (influence actor's mission), and 4 (influence existence). The next stage is filling in the 2MAO table. The same as the MDI table, the 2MAO table is filled with scores 0-4. The actor's position towards this goal is reflected by the actor's attitude and assessment of whether he supports or rejects the goal. This matrix is filled with the values 0 (the goal has a gloomy outcome), 1 (the goal interferes with the actor's operational procedures), 2 (the goal interferes with the success of the actor's work), 3 (the goal interferes with the achievement of the actor's mission, and 4 (the goal interferes with the actor's existence). MACTOR software then processes the data into various features which are graphical representations that help interpret relationships between actors, actor competitiveness, and actor relationships with goals (Fauzi, 2019). These methods enhance understanding of stakeholder roles, influence, and objective congruence to optimize development programs in complex agricultural settings.

RESULTS AND DISCUSSION

Degrees of Influence and Dependence between Actors

The result of MACTOR analysis shows, firstly, the degrees of influence and dependence between actors. The actor's influence represents the actor's ability to influence other actors, design, planning, and implementation of organic farming development in Gentungan Village. The power of actor's influence can be defined by the actors' ownership of material resource, social position, and knowledge on the future of a system (Tronvoll, 2017).

Direct and indirect influences between actors can be seen in Table 1. The figures put in the fifth column (the last column in the right) indicate net direct and indirect influences, while the indicator in the last bottom line indicates the degree of net direct and indirect dependence). The values shown represent direct and indirect dependence of actors. The higher the value, the more the influence of an actor is on another. This provides insight into the power structure and relational dynamics that shape collaboration and decision-making among actors. The result of analysis on the degrees of influence and dependence between actors is presented in Table 1.

Table 1. The Result of Analysis on the Degrees of Influence and Dependence between Actors

MDII	Head of Farmer Group	Agricultural Extensionist	Mentor of Farmer Group	Members of Farmer Group	Farmers	Agricultural Office	Village Officials	Sebelas Maret University	Young Farmers	ii
Head of Farmer Group	20	17	19	20	19	14	10	19	16	134
Agricultural Extensionist	17	17	16	17	15	13	9	16	14	117
Mentor of Farmer Group	22	18	19	21	20	14	10	20	16	143
Members of Farmer Group	18	16	17	18	17	14	10	17	16	125
Farmers	14	13	14	14	14	12	10	14	13	104
Agricultural Office	16	17	15	17	15	13	9	15	14	118
Village Officials	9	9	9	9	9	9	8	9	9	72
Sebelas Maret University	19	17	19	19	18	13	10	19	17	132
Young Farmers	18	16	17	17	16	12	10	17	16	123
Di	133	123	126	134	129	101	78	127	117	1068

From Table 1, it can be seen that the actors with highest value in direct and indirect influence is the mentor of farmer group with score of 143, followed with the head of farmer group with score of 134, UNS (University) with score of 132, members of farmer group with score of 125, young farmers with score of 123, Office of Agricultural Affairs with score of 118, Extensionist with score of 117, farmers with score of 104, and Village Government with score of 72. The nine actors are the ones highly influential in the strategy of developing organic rice in Farmer Group “Mulyo 1”.

The mentor of farmer group achieves the highest direct and indirect influence because he serves to motivate all members, farmers, and other actors in the development of organic rice. All internal and external activities are coordinated by the mentor of farmer group. Then, the head of farmer group serves to coordinate the members of farmer group and group activities along with the mentor of farmer group. This is strongly supported by findings from agricultural empowerment models such as the Meutaloe Wareeh model in North Aceh, which emphasize the critical role of mentors or facilitators in motivating and guiding farmers through active participation, knowledge sharing, and social cohesion that leads to higher productivity and sustainability in organic rice farming. Mentors facilitate cooperation and trust-building within farmer groups, enhancing collective action and reducing dependency on external inputs. This mentoring role is indispensable to the overall success and welfare improvement of organic rice farming communities, as documented in recent studies on organic farmer group dynamics and empowerment strategies (Suadi et al., 2025). Mustopa et al. (2023) state that the head of farmer groups serves to provide innovation, information, and non-formal education to the members in the implementation of farming activities to achieve the objective efficiently. UNS (Sebelas Maret University) can support the development of organic rice through such programs as *MBKM* (Freedom to Learn-Independent Campus), *PPK Ormawa*, and matching funds with the help of facilities and training to improve the farmers’ knowledge and skill. The farmers can be the partners of university in applying *Tri Darma* (Three Pillars) of university, particularly in the service program with educative approach involving socialization and training (Nik et al., 2023).

The members of farmer group also have high influence because their opinion and suggestion can influence the implementation of organic rice development (Wardani, 2024). Young farmers serve to motivate the young farmers in developing organic rice and facilitating joint learning activity. Office of Agricultural Affairs as a governmental institution has some policies and facilitates any activities done by farmer groups through giving aids in the form of farming production tools and facilities. Agricultural extensionist relates to the role of it as facilitator, supervisor, and evaluator. In this case, agricultural extensionist (Hasan et al., 2021) plays a very strategic role in supporting and escorting the program (Abdullah et al., 2021). Moreover, the regeneration of young farmers is crucial to sustaining high-quality organic rice production, as young farmers introduce innovation and ensure the continuity of farming practices. Additionally, active participation and cooperation within the farmer group strengthen the implementation of organic farming policies and programs (Santi et al., 2022).

The actors with highest direct and indirect dependence on other actors, as shown in Table 5.1, are the members of Farmer Group with score of 134, followed with the head of Farmer Group with score of 133, the farmers with score of 129, UNS (university) with score of 127, the mentor of Farmer Group with score of 126, the agricultural extensionist with score of 123, the young farmer with score of 117, the Office of Agricultural Affairs with score of 101, and the Village Government with score of 127. The actors with highest dependence are the members of farmer group. As the implementer, the members of farmer group need others’ help and motivation. The head of Farmer Group has high dependence because he needs partner’s help to establish cooperation in the development of organic rice. The farmers have high dependence because the activity of organic rice development implemented in Farmer Group “Mulyo 1” can benefit the farmers through the facilities of organic rice production provided. The high dependence of farmer group members on internal dynamics aligns with findings by Wahyuni et al. (2017), who state that strong group dynamics and effective communication networks are critical factors in increasing farmers’ capacity to adopt organic rice farming practices. This suggests that the ‘Mulyo 1’ group serves as a vital learning platform for its members.

UNS (Sebelas Maret University or in Indonesian, *Universitas Sebelas Maret*) has high dependence because in implementing the activity of organic rice development, it needs members and farmers’ participation. The mentor of Farmer Group has high dependence because he needs all actors’ participation in the implementation of organic rice development. Agricultural extensionist has high dependence because the facilitation performed is dependent on the farmer group. Young farmers have high dependence because all activities are still based on the activities of farmer group “Mulyo 1”.

Map of Actors' Influence and Dependence

The map of influence and dependence between actors are the graphic representation of actors' position in relation to (direct and indirect: Di and Ii) influence and dependence between one and another. Based on its strength, the actors are position in the map of actors' influence and dependence that can be divided into dominant actors (high influence), dominated actors (high dependence), isolated actor (low influence and high dependence), and relay actor (high influence and high dependence) (Elmsalmi & Hachicha, 2014). This categorization is widely used to analyze stakeholder roles and power dynamics in agricultural development projects, illustrating how dominant actors drive initiatives, dominated actors rely on others, isolated actors operate independently, and relay actors both influence and depend on multiple stakeholders, enabling coordination and decision-making processes (Sartika et al., 2023).

The position is calculated automatically by MACTOR software. The actors with high degree of influence and low degree of dependence (influential stakeholders) are in the first quadrant. The actors with high influence and high dependence (Relay Stakeholders) are in the second quadrant. The actors with low degree of influence and high degree of dependence (Dependent stakeholders) are positioned in the third quadrant (Bundy et al., 2018). This quadrant analysis provides a clear visualization of stakeholder power and dependency, enabling more effective strategy development and resource allocation to strengthen organic rice farming initiatives. Such categorization helps identify which stakeholders can lead, which require support, and how interdependencies shape collaborative efforts in agricultural development (Mukhlis et al., 2025). The actors with low influence and low dependence on other actors (autonomous stakeholders) are positioned in the fourth quadrant. This mapping is intended to confirm the position of actors (stakeholders) from the result of data processing related to direct and indirect influence and direct and indirect dependence on other actors, as shown in Figure 1.

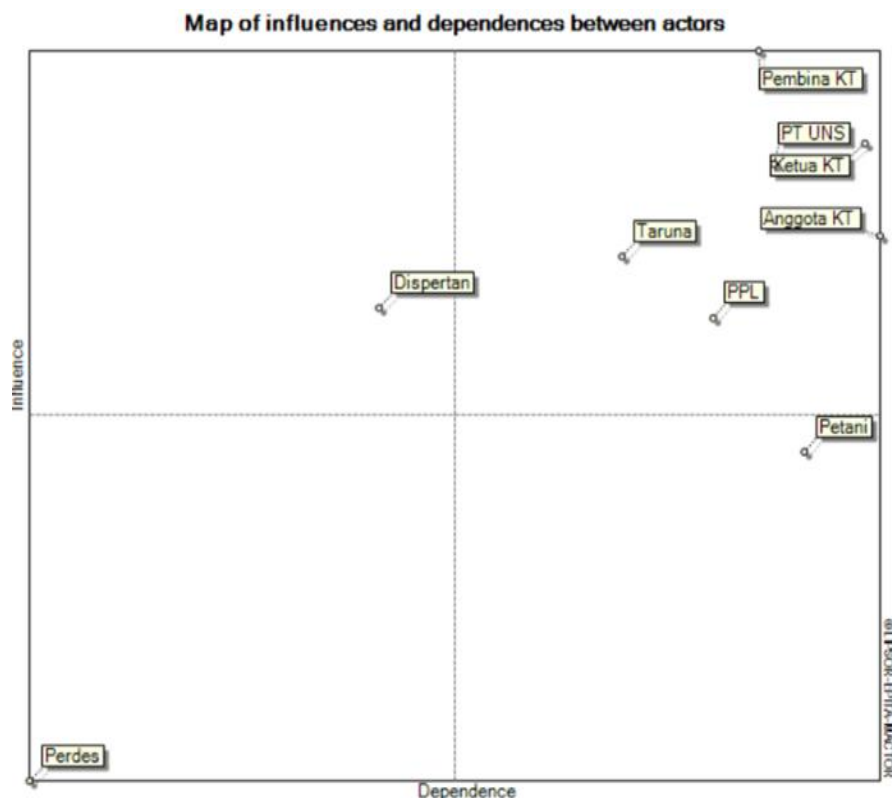


Figure 1. Map of Actors' Influence and Dependence

From Figure 1, the actor with high influence and low dependence positioned in the first quadrant (upper left) is the Central Office of Agricultural Affairs. This result implies that the actor has high influence because it is a governmental actor authorized to make policy and provide aid. It is not dependent on any single farmer group. Government policies, such as those documented by Raintung et al., (2021), support organic rice development by facilitating education, provision of organic fertilizers, marketing guidance, and certification programs. The Central Office's role in socializing these policies and providing technical assistance to farmer groups ensures the successful implementation and scaling of organic rice

programs. This comprehensive support system strengthens the agency’s influential position in advancing organic rice initiatives (Triyono et al., 2025).

The actors with high influence and high dependence positioned in the second quadrant (upper right) are mentors of Farmer Group, UNS (University), Head of farmer group, young farmer, and agricultural extensionist. The actors belonging to the second quadrant are directly related to the development of organic rice so that they have high influence and dependence. Then, the actor with low degree of influence and high degree of dependence positioned in the third quadrant (lower right) is the farmers. It is because farmers as the actors of cultivation do not have power to express opinion, but the farmers can benefit from this organic rice development activity as they can use the farming production facilities together.

The actors with low influence and dependence positioned in the fourth quadrant (lower left) are Gentungan Village officials. These actors are positioned in the fourth quadrant because Village Government do not have influence on policy and merely provide training and aid capital in the form of Tyto Alba bird and its cage to eradicate rat pests. This activity is funded by Village Fund. Government Regulation (Indonesian: *Peraturan Pemerintah*, thereafter called PP) Number 43 of 2014 containing the regulation of the implementation of Law (Indonesian: *Undang-Undang* or UU) No.6 o 2014 about Village mentions that village expenditure contained in Village Income and Expenditure Budget (Indonesian: *Anggaran Pendapatan dan Belanja Negara* or APBDes) is allocated with the following stipulation: 70% for village development and community empowerment and building costs, and the rest of 30% for funding the organization of village government (Imaningtyas, 2022).

Actors’ Competitiveness

The actors’ competitiveness is led by the direct and indirect influence of the actor on other actors. The actors with scores > 1 (100%) have high competitiveness and otherwise, the ones with score < 100 have low competitiveness (Wardono et al., 2019). The result of analysis on the actors’ competitiveness is explained in Figure 2.

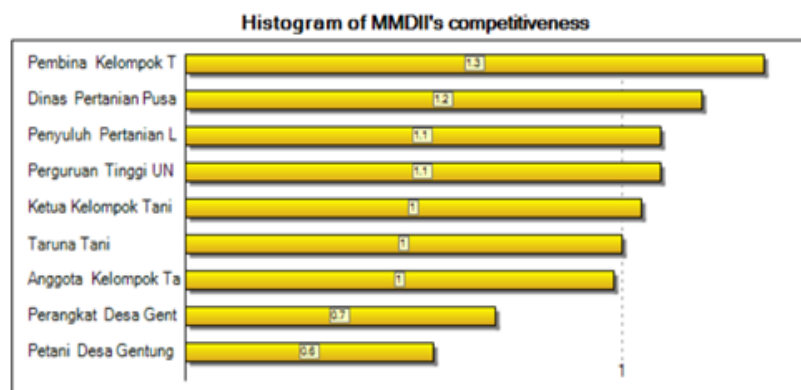


Figure 2. Result of Analysis on Actors’ Competitiveness

From Figure 2, the actors with highest competitiveness are the mentor of Farmer Group “Mulo 1” with score of 1.3, Central Office of Agricultural Affairs with score of 1.2, Agricultural Extensionist and UNS (University) with score of 1.1. The mentor of Farmer Group “Mulo 1” has very high competitiveness because it plays a very important role in the strategy of developing organic rice in Gentungan Village. The mentor of Farmer Group engages fully from the beginning of activities by initiating organic rice cultivation and inviting the farmers to apply organic rice farming. The mentor of group also supervises and evaluates every activity in the organic rice development program so that his role cannot be neglected.

There is another actor with high competitiveness, the Central Office of Agricultural Affairs. The Central Office of Agricultural Affairs is an actor playing an important role in providing direct aid to the farmer group to support the development of organic rice in Gentungan Village. Another actor with high competitiveness is Agricultural Extensionist as the facilitator of farmers and UNS (Sebelas Maret University) as the partner that holds various activities such as PPK Ormawa, MBKM, and *Matching fun* also supporting the development of organic rice through several programs and activities aids given to the farmer group.

Actors' Interaction and Objective

Weighted valued position matrix (3MAO) represents the position of each actor in every objective. This reckons their degree of opinion in each objective, objective hierarchy, and competitiveness among the actors. This matrix yields two outputs: firstly, degree of mobilization that will explain target/objective mostly driving the actors, and secondly, mobilization that will explain the actors mostly mobilized to use resource to achieve the objective (Cadith et al., 2019).

From Table 2, the Mentor of Farmer Group is the most active actor in the strategy of developing organic rice to achieve the existing objective with mobilization value of 25.6. Meanwhile, the objective of organic rice development to facilitate organic rice production is the one mostly driving the actors in which the objective will be the basic matter provoking other actors' reaction with Degree of Mobilization score of 33.8. This finding is supported by studies showing that farmer groups play a central role in coordinating organic farming activities, including regular meetings, cooperation, and managing production units, all of which are essential for sustaining organic rice production. The mentor's active involvement in initiating and supervising activities, as well as fostering knowledge sharing, is critical to achieving collective goals and encouraging continuous farmer participation (Santi et al., 2022). Furthermore, strong collaboration among stakeholders, such as farmer groups, government agencies, and academic institutions, is crucial for advancing sustainable organic rice farming, highlighting the importance of the mentor's mobilizing role in this network.

Table 2. Matrix Value of Actor Mobilization

MDII	Production	Marketing	Capability	Learning	Regeneration	Mobilisation
Head of Farmer Group	4.4	4.4	4.4	4.4	3.3	21.1
Agricultural Extensionist	3.8	2.8	3.8	3.8	1.9	16.1
Mentor of Farmer Group	5.1	5.1	5.1	5.1	5.1	25.6
Members of Farmer Group	4.0	4.0	3.0	4.0	2.0	17.0
Farmers	3.1	3.1	1.6	2.3	1.6	11.7
Agricultural Office	4.4	3.3	3.3	4.4	2.2	17.6
Village Officials	2.4	1.8	2.4	1.8	1.2	9.5
Sebelas Maret University	3.4	4.5	4.5	4.5	4.5	21.3
Young Farmers	3.2	3.2	4.3	3.2	4.3	18.1
Number of Agreement	33.8	32.3	32.3	33.6	26.0	
Number of Disagreement	0.0	0.0	0.0	0.0	0.0	
Degree of Mobilisation	33.8	32.3	32.3	33.6	26.0	

Potential Cooperation and Conflict between Actors

Actor convergence represents the similarity of actors' attitude to the objective. The convergence wants to reveal the intensity of each actor and how many actors do have similar objective (Faridz et al., 2024). Actors with similar attitudes will be convergent, while those with different attitudes will be divergent. Convergence analysis is intended to find out the possible points of potential actor alliance. Convergence graph can be used to determine the actors that can cooperate to avoid the potential conflict. This convergence mapping graph can help create alliance among actors because there are shared perception and specified objective (Puspita et al., 2024).

From Figure 3, the Head of Farmer Group "Mulyo 1" and Sebelas Maret University have high convergence relation to the mentor of Farmer Group "Mulyo 1". This indicates that the actors have high possibility to build cooperation. This information implies that cooperation between actors is very important in the strategy of developing organic rice in Farmer "Group Mulyo 1". The development of organic rice farming should engage various stakeholders to maintain commitment and cooperation between sectors (Fadlina et al., 2013). Arimbawa et al. (2024) also highlights that strong collaboration among farmers, government agencies, extension workers, and universities is essential for the successful adoption and sustainability of organic rice farming. Such multi-stakeholder convergence facilitates

shared knowledge, resource mobilization, and conflict resolution, thereby enhancing farmer motivation and improving agricultural ecosystems.

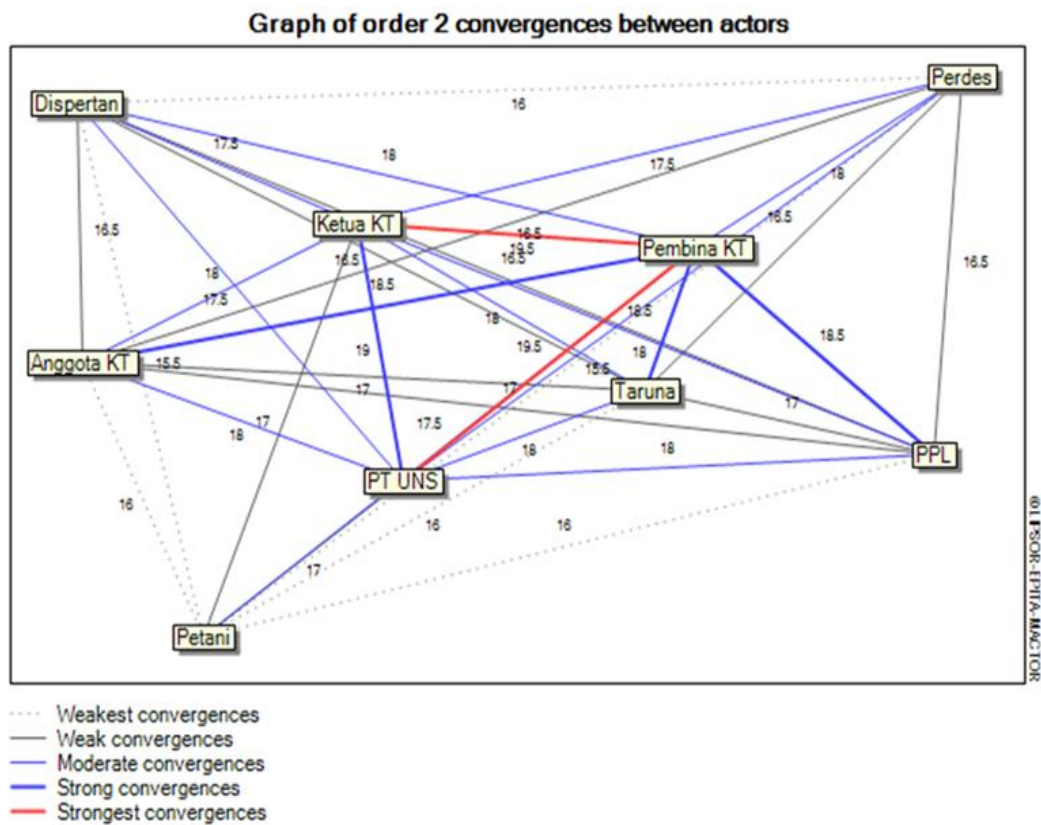


Figure 3. Graph of Convergence Mapping between Actors

Divergence is a discrepancy that can be potential conflict between actors because there is a difference in the number of positions of each actor to the objective formulated. Divergence between actors in MACTOR analysis explains that each actor has different and incompatible objectives (Puspita et al.,2024). The potential for strong cooperation between the Mentor, University, and Farmer Group Head demonstrates effective stakeholder communication. As noted by Fibriyanti et al. (2021), the success of agricultural programs heavily relies on the quality of communication and coordination among stakeholders, which accelerates the diffusion of innovation and ensures the sustainability of adoption. This analysis identifies the number of potential conflicts by considering the hierarchy of some actors' objectives. Degree of divergence between actors can be seen in Table 3.

Table 3. Matrix Value of Divergence Between Actors

MDII	Head of Farmer Group	Agricultural Extensionist	Mentor of Farmer Group	Members of Farmer Group	Farmers	Agricultural Office	Village Officials	Sebelas Maret University	Young Farmers
Head of Farmer Group	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agricultural Extensionist	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mentor of Farmer Group	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Members of Farmer Group	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Farmers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agricultural Office	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Village Officials	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sebelas Maret University	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Young Farmers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Di	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Degree of Divergence (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

From Table 3, the matrix value of convergence not only shows the degree of divergence between actors. In addition, the matrix also shows that there is no or there is only small potential conflict between actors involved. It is because the strategy of developing organic rice are accepted well by all actors involved and no actor resists it. All actors have similar objectives in the strategy of developing organic rice and thereby minimizes the conflict. If a conflict occurs, a clear understanding of the conflict can be helpful in taking some actions to prevent and to manage conflict effectively (Sari & Hardianti, 2019).

Closeness between Objectives and Actors

Graph of distances between objectives (Map of net distances between objectives) is used to identify the objectives where the actors take the same position (either pros or cons). This graph maps the objective in relation to the scale value of difference between convergence and divergence matrix values. The graph of distance between objectives represents the interrelation between objectives and the interrelation between program objectives. The potential closeness occurring between objectives and between actors is explained in Figure 4.

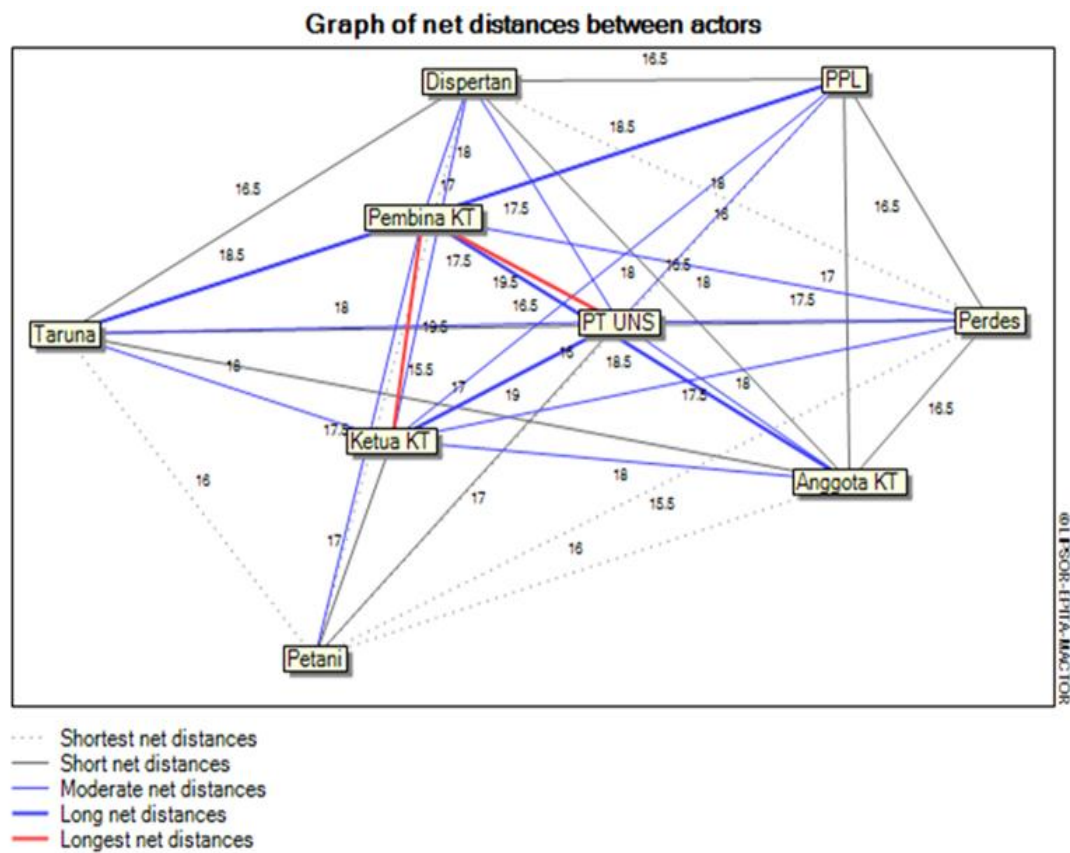


Figure 4. Graph of Distances Between Actors

Figure 4 presents the graph of distance between actors (Map of net distances between actors) indicating that the red line shows the closest relation. The head of Farmer Group “Mulyo 1” and UNS (Sebelas Maret University) has close distance relation to the mentor of Farmer Group “Mulyo 1”. This implies that the actors have highest potency to build alliance or cooperation. This information shows that cooperation between actors is very important to the strategy of developing organic rice. It is in line with a statement that the development of a farmer group is influenced by the engagement and the cooperation between stakeholders (Wijaya et al., 2023). Economically, this network of cooperation contributes to better farmer welfare, in line with evidence from Kolaka District showing the income improvement of organic farmers (Fyka et al., 2025). In addition to being viewed by the potential actor alliance/cooperation, it can be seen from the convergence of objectives as presented in Figure 5.

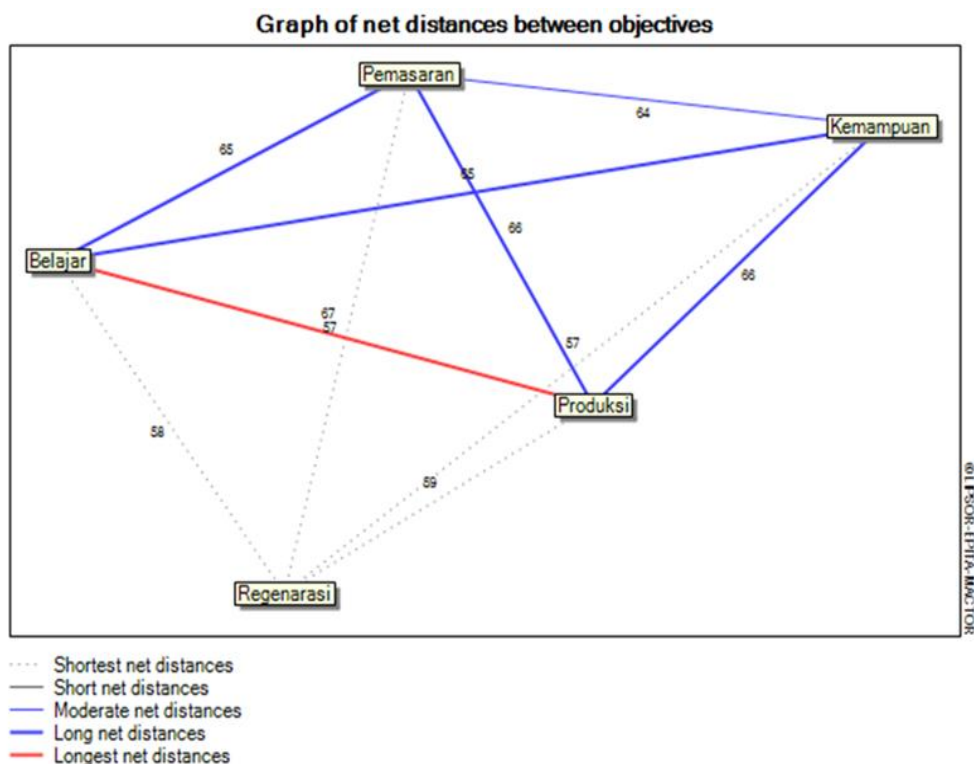


Figure 5. Graph of Convergence between Objectives

Figure 5 shows that the distance relation between objectives facilitates the production of organic rice and the procurement of place to learn organic has close relation. This indicates the strong relation between objectives in the strategy of developing organic rice. The closeness of relation between objectives is represented using red and blue lines. The red line indicates that the distance of relation between objective is closer than the blue line does (Kurnianingsih et al., 2024). This strong link aligns with Dinanti et al. (2022) emphasizing that combining practical learning spaces with production facilitation significantly enhances farmers' adoption of organic practices, leading to improved productivity and sustainability. Providing accessible learning environments alongside production support fosters knowledge transfer, innovation adoption, and community engagement, which are critical for successful organic rice farming development.

CONCLUSION

The result of MACTOR analysis shows that the Mentor of Farmer Group has highest influence on the development of organic farming in Gentungan Village, followed by head of Farmer Group, UNS, and other actors. The Mentor of Farmer Group plays an important role in coordinating and motivating other actors, while the Head of Farmer Group organizes the members' activities. UNS, as a university, supports it through training program, while the actors like members of Farmer Group, Head of Farmer Group, and Farmers are dependent on other actors' support. The map of influence classifies the actors into dominant, relay, dominated, and isolated categories, with the Central Office of Agricultural Affairs being dominant actor and the Mentor of Farmer Group and UNS being relay actors.

Competitiveness is also important, with the Mentor of Farmer Group "Mulyo 1" having highest competitiveness, followed with Central Office of Agricultural Affairs, Agricultural Extensionist, and UNS. Matrix 3MAO indicates that the main objective motivating the actors is to facilitate the production of organic rice, and the Mentor of Farmer Group is the most active actor in achieving the objective. Convergence between Head of Farmer Group, UNS, and Mentor of Farmer Group indicates strong cooperation potency, while divergence between actors is very low, leading to small potency of conflict. The objectives like organic rice production and the procurement of places to learn are closely related to each other in the strategy of developing organic rice.

Presenting conclusions that can answer the research objectives and show novelty or conceptualization of ideas. Don't write your conclusions in bullet points.

ACKNOWLEDGEMENT

The author would like to thank the Institute of Research and Community Service, Sebelas Maret University, for financial support. The author would like to thank the Institute of Research and Community Service, Sebelas Maret University, for financial support provided through the Community Empowerment Research Grant Group, Graduate School.

BIBLIOGRAPHY

- Abdullah, A. A., Rahmawati, D., Panigoro, M. A., Syukur, R. R., & Khali, J. (2021). Peran penyuluh pertanian terhadap meningkatkan partisipasi petani di Desa Ilomangga Kecamatan Tabongo. *Jurnal Agrinesia*, 5(2), 148–154.
- Adil, A., Syarief, R., Widiatmaka, & Najib, M. (2022). Stakeholder analysis and prioritization of sustainable organic farming management: A case study of Bogor, Indonesia. *Sustainability*, 14(24), 16706. <https://doi.org/10.3390/su142416706>
- Arimbawa, P., Arsana, I. M. W., Bande, L. O. S., Batoa, H., Taufik, Y., Kasim, S. (2023). Adoption of organic rice farming in East Kolaka Regency, Indonesia: Factors and Stakeholder Collaboration. *International Journal of Sustainable Development and Planning*, 19(4), 1461–1468. <https://doi.org/10.18280/ijstdp.19042>
- Bram, D. (2022, June 20). *Pemkab Karanganyar canangkan sebagai kabupaten penghasil pertanian organik*. Jawa Pos Radar Solo. <https://radarsolo.jawapos.com/karanganyar/841685856/pemkab-karanganyar-canangkan-sebagai-kabupaten-penghasil-pertanian-organik>
- Bundy, J., Vogel, R. M., & Zachary, M. A. (2018). Organization–stakeholder fit: A dynamic theory of cooperation, compromise, and conflict between an organization and its stakeholders. *Strategic Management Journal*, 39(2), 476–501. <https://doi.org/10.1002/smj.2736>
- Charina, A., Kusumo, R. A. B., Sadeli, A. H., & Deliana, Y. (2018). Faktor-faktor yang mempengaruhi petani dalam menerapkan standar operasional prosedur (SOP) sistem pertanian organik di Kabupaten Bandung Barat. *Jurnal Penyuluhan*, 14(1), 68–78. <https://doi.org/10.25015/penyuluhan.v14i1.16752>
- Dinanti, S. S., Nofriani, & Nefri, J. (2022). Implementation of SNI 6729: 2016 in organic rice cultivation and financial feasibility analysis. *Journal of Agri Socio Economics and Business*, 4(2), 95–106. <https://doi.org/10.31186/jaseb.v4i2.24734>
- Fibriyanti, D., Sadono, D., & Sarwoprasodjo, S. (2021). Komunikasi stakeholder pada kegiatan kaji terap budidaya padi toleran salinitas di BPTP Jawa Barat. *Jurnal Penyuluhan*, 17(1), 85–102. <https://doi.org/10.25015/17202133453>
- Durán-Lara, E. F., Valderrama, A., & Marican, A. (2020). Natural organic compounds for application in organic farming. *Agriculture*, 10(2), Article 41. <https://doi.org/10.3390/agriculture10020041>
- Elmsalmi, M., & Hachicha, W. (2014). Risk mitigation strategies according to the supply actors' objectives through MACTOR method. *Proceedings of the 2014 International Conference on Advanced Logistics and Transport (ICALT)*, 362–367. <https://doi.org/10.1109/ICAdLT.2014.6866339>
- Fadlina, I. M., Supriyono, B., & Soeaidy, S. (2013). Perencanaan pembangunan pertanian berkelanjutan: Kajian tentang pengembangan pertanian organik di Kota Batu. *J-PAL: Jurnal Aplikasi Dan Inovasi Ipteks*, 4(1), 43–57.
- Faridz, R., Kustini, R., & Fansuri, H. (2023). Analisis peran stakeholder dalam pengembangan garam menggunakan metode Matrix of Alliance Conflict: Tactic, Objective and Recommendation (MACTOR). *Industri Magister*, 10–19.
- Fyka, S. A., Limi, M. A., & Cristi, B. (2025). Impact of System of Rice Intensification (SRI) organic rice on farmer welfare in Kolaka District, Southeast Sulawesi, Indonesia. *Agro Bali: Agricultural Journal*, 8(2), 364–376. <https://doi.org/10.37637/ab.v8i2.2306>
- Girsang, M. A., Ramija, K. E., Marpaung, I. S., Manurung, E. D., Sipahutar, T., Haloho, L., & Nainggolan, P. (2021). Characteristics of rice agribusiness in rural areas of Serdang Bedagai

- regency, North Sumatra. *IOP Conference Series: Earth and Environmental Science*, 807(3), Article 032062. <https://doi.org/10.1088/1755-1315/807/3/032062>
- Godet, M., & Durance, P. (2011). *Strategic Foresight for Corporate Strategy*. Palgrave Macmillan.
- Hasan, N., Wardani, R. R. I. K., Fahmi, K. I., Ciptasari, S. A. A., Arfiansyah, Y. C., Widiawati, & Rusdiyana, E. (2021). Design of interactive agricultural extension media for student in the material of family medicinal plant utilization. *IOP Conference Series: Earth and Environmental Science*, 759(1), Article 012064. <https://doi.org/10.1088/1755-1315/759/1/012064>
- Heryadi, D. Y., Noor, T. I., Deliana, Y., & Hamdani, J. S. (2022). Model implementatif agribisnis padi organik berkelanjutan melalui pendekatan pentahelix. *Jurnal Agribest*, 6(1), 1–10. <https://doi.org/10.32528/agribest.v6i1.7525>
- Ibrahim, J. T., & Mufriantje, F. (2021). *Sumber daya manusia sektor pertanian dalam berbagai perspektif*. Penerbit Psychology Forum bekerjasama dengan DPPs UMM.
- Imaningtyas, E. (2022). Pengelolaan APBDES untuk meningkatkan pendapatan masyarakat desa. *Journal of Development Economic and Social Studies*, 1(3), 461–468. <https://doi.org/10.21776/jdess.2022.01.3.11>
- Kurnianingsih, T. (2024). *Identifikasi aktor dan peranannya dalam pengembangan agrowisata (studi kasus di desa jatirejo dan desa kemuning, kecamatan Nargoyoso, Kabupaten Karanganyar)* [Skripsi, Universitas Sebelas Maret]. UNS Pascasarjana / Institutional Repository.
- Maharani, I. G. A. A. B. S., & Suasih, N. N. R. (2025). Analysis of stakeholder roles in the sustainability of red rice farming in Jatiluwih Village. *International Journal of Economic Literature*, 2(10), 1237–1259.
- Makmun, M., Fahmid, I. M., Ali, M. S. S., Saud, Y. M., & Rahmadanih. (2024). Power relations among actors in laying hen business in Indonesia: A MACTOR analysis. *Open Agriculture*, 9(1), Article 20220334. <https://doi.org/10.1515/opag-2022-0334>
- Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review*, 22(4), 853–886. <https://doi.org/10.5465/amr.1997.9711022105>
- Mukhlis, I., Fauzan, S., Rahmawati, F., de Silva, S., & Melati, I. S. (2025). Stakeholder dynamics and sustainable waste management in peri-urban settings: A case study of actor interactions in Indonesia. *Frontiers in Sustainable Cities*, 7, 1509601. <https://doi.org/10.3389/frsc.2025.1509601>
- Mustopa, M., Rangga, K. K., & Aviati, Y. (2023). Peran ketua kelompok tani pada peningkatan produktivitas padi sawah di Desa Margosari Kecamatan Pagelaran Utara Kabupaten Pringsewu. *Indonesian Journal of Socio Economics*, 2(1), 1–6.
- Nik, N., Lelang, M. A., & Rusae, A. (2023). Pendampingan kelompok tani dalam budidaya tanaman hortikultura berbasis organik di Desa Sallu. *Communnity Development Journal*, 4(6), 13394–13403.
- Pratasik, S., & Maulida, S. (2021). Analisis rantai pasok beras di Tebing Tinggi. *Edutik: Jurnal Pendidikan Teknologi Informasi dan Komunikasi*, 1(5), 460–468. <https://doi.org/10.53682/edutik.v1i5.2759>
- Pratiwi, R. A., Suwanto, & Wijianto, A. (2019). Peran kontak tani dalam budidaya padi organik di Kecamatan Mojogedang Kabupaten Karanganyar. *AGRITEXTS: Journal of Agricultural Extension*, 43(1), 8–15. <https://doi.org/10.20961/agritexts.v43i1.41625>
- Puspita, K. M., Putri, R. A., Arisanti, W., & Istiqomah, N. (2024). Analisis stakeholder dalam pengembangan Desa Wisata Banyuanyar Boyolali. *Jurnal of Policy*, 15(1), 24–32.
- Qin, T., Wang, L., Zhou, Y., Guo, L., Jiang, G., & Zhang, L. (2022). Digital Technology-and-Services-Driven Sustainable Transformation of Agriculture: Cases of China and the EU. *Agriculture*, 12(2), 297. <https://doi.org/https://doi.org/10.3390/agriculture12020297>
- Raintung, A., Sambiran, S., & Sumampow, I. (2021). peran pemerintah desa dalam pemberdayaan kelompok tani di Desa Mobuya Kecamatan Passi Timur Kabupaten Bolaang Mongondow. *Journal*

Governance, 1(2), 1–9.

- Rizki, M. I., Wahyuni, A. A., Kholiq, N., Samsita, B., Difa, M. H., Oktavira, I. C., Fitriani, S. N., & Widiyanti, E. (2022). *Pembentukan Taruna Tani Desa Gentungan Guna Regenerasi Petani dan Pengembangan Pertanian Organik Berbasis Cooperative Farming*. UNS Press.
- Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.
- Wardani, R. I. K. (2024). Economic perspective in adopting corn (*Zea mays*) agroforestry patterns to increase income: Lessons learned from women forest farmers. *African Journal of Biological Sciences*, 6(8), 3202–3215.
- Sadono, D. (2008). Pemberdayaan petani: Paradigma baru penyuluhan pertanian di Indonesia. *Jurnal Penyuluhan*, 4(1), 65–74. <https://doi.org/10.25015/penyuluhan.v4i1.2172>
- Santi, I. W., Bakhtiar, A., & Agustina, Y. (2022). The roles of a farmer group in the development of organic rice (BRITANIC) in Krisik Gandusari Village. *Jurnal Social Economic of Agriculture*, 11(2), 100–108. <https://doi.org/10.26418/j.sea.v11i2.55889>
- Sari, G. G., & Hardianti, G. (2019). Implementasi excellence public relations dalam pengelolaan konflik oleh Energi Mega Persada Bentu Limited. *Jurnal Online Mahasiswa Fakultas Ilmu Sosial dan Ilmu Politik Universitas Riau*, 6(2), 1–15.
- Sartika, R. C., Purwaningsih, Y., Gravitiani, E., & Nitiyasa, P. (2023). The role of stakeholders in achieving sustainable agriculture: A case study in Sragen Regency, Indonesia. *Nature Environment and Pollution Technology*, 22(4), 2181–2188. <https://doi.org/10.46488/NEPT.2023.v22i04.044>
- Suadi, S., Nasution, A. A., & Isbahannur, I. (2025). Meutaloe Wareeh agricultural empowerment model in organic rice farming groups in North Aceh. *Indonesian Journal of Religion and Society*, 7(1), 1–14. <https://doi.org/10.36256/ijrs.v7i1.457>
- Triyono, Alamsyah, N., Widodo, Riptanti, E. W., Rozaki, Z., Kamarudin, M. F., Jayanti, T. L., & Yunanto. (2025). The collaborative roles of stakeholders in advancing sustainable organic rice farming in Yogyakarta. *Organic Farming*, 11(3), 135–151. <https://doi.org/10.56578/ofl10301>
- Tronvoll, B. (2017). The actor: The key determinator in service ecosystems. *Systems*, 5(2), Article 38. <https://doi.org/10.3390/systems5020038>
- Wahyuni, A. A., Audria, A. M., Kirana, B. N., Oktavira, I. C., Arifuddin, M. F., Rizki, M. I., Haurelia, N. F. S., Latifah, N., Amin, S. D. A., & Hudan, Y. N. (2023). Pengembangan potensi pertanian organik berbasis kearifan lokal di Desa Gentungan, Kecamatan Mojogedang, Kabupaten Karanganyar. *COSMED: Journal of Cooperative, Small and Medium Enterprise Development*, 2(2), 1–12. <https://doi.org/10.20961/cosmed.v2i1.92398>
- Wahyuni, S., Sumardjo, Lubis, D. P., & Sadono, D. (2017). Hubungan jaringan komunikasi dan dinamika kelompok dengan kapasitas petani dalam agribisnis padi organik di Jawa Barat. *Jurnal Penyuluhan*, 13(1), 110–120. <https://doi.org/10.25015/penyuluhan.v13i1.15115>
- Wijaya, R. J., Suminah, & Suwanto. (2023). Peran stakeholders dalam pengembangan Kelompok Tani Ngudi Utomo di Desa Karangasem Kabupaten Klaten. *BULLET: Jurnal Multidisiplin Ilmu*, 2(4), 1049–1056.