AGRIBUSINESS-BASED FARMER EMPOWERMENT MODEL WITH A SUSTAINABLE INTEGRATED FARMING SYSTEM APPROACH TO INCREASE INCOME MULTIPLIER EFFECT

Ngatindriatun[1,*] and Fauzul Adzim[2]

Abstract

This study aimed to develop an agribusiness-based farmer empowerment model with a sustainable integrated farming system approach in order to increase the income multiplier effect. This research consists of a mixed methods approach combining qualitative and quantitative methods. The data used in this study consist of both primary and secondary data. Secondary data used in the study were obtained from publications, reports, and other sources to support the analysis. Primary data were obtained from Focus Group Discussion (FGD). The first analytical method used in this research is descriptive statistical analysis, while the second analysis consisted of a Matrix of Alliances and Conflicts: Tactics, Objectives and Recommendations (MACTOR). The results showed that the agricultural potential in Kopeng Village includes the availability of extensive and fertile land, abundant human resources, and a highly abundant variety of agricultural commodities. Meanwhile, existing problems include high production costs, difficulty in accessing capital, low competence of human resources, a volatile climate, the perishable nature of horticultural commodities, dependence on middlemen, and a lack of post-harvest innovation. The efforts to empower agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village requires collaboration and synergy from various stakeholders. The actors who have the highest influence are organic farmers, while the actors who have the highest dependence are the processing industry and agricultural services. Meanwhile, the actors with the highest

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influence and dependence include organic farmers, inorganic farmers, vegetable agents, farmers' groups and women's farmers' groups. In an effort to empower farmers in Kopeng Village, the issues of greatest concern are reducing the use of chemical fertilizers and pesticides, reducing poverty, conserving biodiversity, and increasing farmers' income. Meanwhile, the most mobilized actors are inorganic farmers, organic farmers, and vegetable traders. Actors who have high competitiveness include vegetable traders, organic farmers, and vegetable agents.

Keywords*:* Kopeng Village, Farmers, Actors, Sustainable integrated farming system

INTRODUCTION

The agricultural sector has an important role in the Indonesian economy. In 2020 the agricultural sector contributed 13.79 percent to the Gross Domestic Product (GDP). In addition to contributing greatly to the formation of Gross Domestic Product (GDP), this sector is the largest energy-absorbing sector in Indonesia. The number of workers working in the agricultural sector reached 8.23 million workers (around 29.76%) in 2020 (Central Bureau of Statistics, 2021). However, if you look at its development, the contribution of the agricultural sector has tended to decrease each year. This is because the sector is considered less profitable and has a high risk.

One area that has abundant agricultural potential in Indonesia is Semarang Regency. The area of Semarang Regency contains agricultural land located at the foot of Mount Ungaran and the foot of Mount Merbabu, which is very fertile agricultural land due to the proximity of the volcanoes. The agricultural sector has an important role for the economy of Semarang Regency. In addition to contributing to the formation of Gross Regional Domestic Product (GRDP), the agricultural sector in Semarang Regency has an important role in providing employment for the population, with 133,947 people working in the agricultural sector, this sector is ranked third in the regency, after the manufacturing sector and the trade sector. This shows that the existence of the agricultural sector must continue to be considered as it plays an important role for the people's source of income. The existence of the agricultural sector must be maintained in order to improve the welfare of the community.

There are several environmental problems accompanying the large contribution of the agricultural sector to the economy of Semarang Regency. The agricultural sector, which tends to exploit nature, is reducing soil fertility and ultimately reducing its productivity. Simultaneously, floods, landslides, air

pollution, and other disasters, continue to occur at an increasing rate in Semarang Regency.

The agricultural sector in Semarang Regency is the sector which provides the largest contribution to the economy, both in terms of the formation of Gross Domestic Product (GDP) and in terms of employment opportunities. However, the performance of the agricultural sector continues to decline from year to year due to the degradation of agricultural land, especially regarding land located on the slopes of the mountains. This land has steep slopes, causing high erosion.

Meanwhile, agricultural production in Semarang Regency continues to decline. In 2019 the production of lowland rice in Semarang Regency was 237,180 tons, reduced from 247,761 tons in the previous year. Upland rice production also decreased by 785 tons over the same period, with 4,490 tons being produced in 2019. Additionally, agricultural land in Semarang Regency has also decreased. In 2019, the harvested area of lowland rice was reduced from the previous year to 40,583 ha, while the harvested area of upland rice was reduced to 1,104 ha.

Agriculture in Semarang Regency plays an important role in the community's economy. Many people in Semarang Regency depend on the agricultural sector for their livelihoods. Therefore, the existence of the agricultural sector must be maintained. The decline in the productivity of the agricultural sector has a negative impact on the welfare of farmers. Farmers must be empowered immediately in order to improve their welfare. However, farmer empowerment must cover both upstream and downstream processes and must be oriented towards sustainable agriculture. Efforts to implement sustainable agriculture can preserve agricultural land so that it will not reduce future benefits. Sustainable agricultural development must be realized so that the existence of agriculture is maintained. Innovation and technology in agriculture are required in order to shift conventional agriculture to modern agriculture (Laurett, Paço, & Mainardes, 2021; Saravia-Matus & Gomez Y Paloma, 2015).

Sustainable agricultural development efforts must involve various aspects. Identification of strengths, threats, and opportunities must be carried out. Economic development must be in line with environmental and social development (Ali, Agyekum, & Adadi, 2021; Streimikis & Baležentis, 2020). Sustainable agricultural development efforts can be influenced by local government policy factors, such as the policy of providing modern agricultural infrastructure, increasing agricultural productivity with nanotechnology and also increasing investment in agriculture (Gómez-Villarino & Ruiz-Garcia, 2021; Strielkowski et al., 2020). In addition, sustainable agricultural development can be carried out by implementing low-carbon agriculture. Low carbon agriculture is agriculture that produces low carbon emissions or

can be said to be environmentally friendly (Moghazy & Kaluarachchi, 2020; Wiśniewski & Mariusz, 2017).

One effort to realize sustainable agriculture that can improve the welfare of farmers is the implementation of sustainable integrated farming systems. An Integrated Farming System (IFS) is a sustainable system which does not stand alone, and which adheres to the principle that everything produced will return to nature. This means that the resulting waste can be reused as a resource for production (Siswati and Nizar, 2014). In essence, the Integrated Agricultural System (IAS) is able to utilize the total agricultural potential so that it can be utilized in a balanced way (Massinai et al., 2013). IAS can solve many problems, not only from an economic and ecological perspective, but also by providing the necessary production facilities such as fuel, fertilizer, and food, in addition to increased productivity. It can change a risky farming system towards an economical farming system, while also generating a balanced ecological condition (Nurhidayati et al., 2008).

Consequently, this study aims to develop an agribusiness-based farmer empowerment model with a sustainable integrated farming system approach in order to increase the income multiplier effect. The model that will be developed uses the Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations (MACTOR) approach which will identify aspects and supporting actors in farmer empowerment.

RESEARCH METHODS

This research utilizes a mixed methods research approach, combining qualitative and quantitative methods. The research was conducted in Semarang Regency, specifically Kopeng Village. The reason for choosing this location is based on the potential for sustainable farmer empowerment in Kopeng Village, considering that the majority of people work in the agricultural sector. The data used in this study include both primary and secondary sources. Secondary data used in the study were obtained from publications, reports, and other reputable sources to support the analysis in the study. Meanwhile, primary data were obtained from Focus Group Discussions (FGD). The results of the FGD were used as the material for the analysis with a factor and actor (stakeholder) approach using the MACTOR analysis tool (Fauzi, 2019). The FGDs in this study were conducted with relevant informants and stakeholders relevant to the research; these consisted of:

a. Bappeda Semarang Regency
b. Semarang Regency Agriculture Service
c. Semarang Regency Environmental Service
d. Non-Governmental Organizations (NGOs)
e. Environmental Activists in Semarang Regency
f. Semarang Regency farmers group
g. Agricultural Cooperatives
h. Village Owned Enterprises
i. Local Village Apparatus

The data collection methods used in this study consisted of in-depth interviews and questionnaires. Questionnaires in this study were distributed to relevant informants to obtain data on the contributions and interaction of actors in empowering farmers.

The first analytical method used in this research was a descriptive statistical analysis to describe the opportunities and problems of the agricultural sector in Kopeng Village, Semarang Regency. Descriptive statistical analysis is a tool used to analyze data via description, describing the data that has been collected as it is without intending to make any conclusions which apply to the population or any generalizations. This analysis occurs only in the form of accumulation of basic data existing only as descriptions in the sense of not seeking or explaining interrelationships, testing hypotheses, making predictions, or drawing conclusions.

In the process of prospective strategy, and scenario thinking, various actors play important roles. The prospective analysis intends to rank stakeholder positions on many strategic issues, assess convergence and divergence, and anticipate coalitions and conflicts (Fauzi, 2019). In the long-term view, policy makers must anticipate justifications for future prime movers that may affect key variables (Omran, Khoris & Saleh, 2014). The prospective analysis approach stems from the work referred to as "a prospective", and in particular from formal scenario planning methodologies (Godet, 2001).

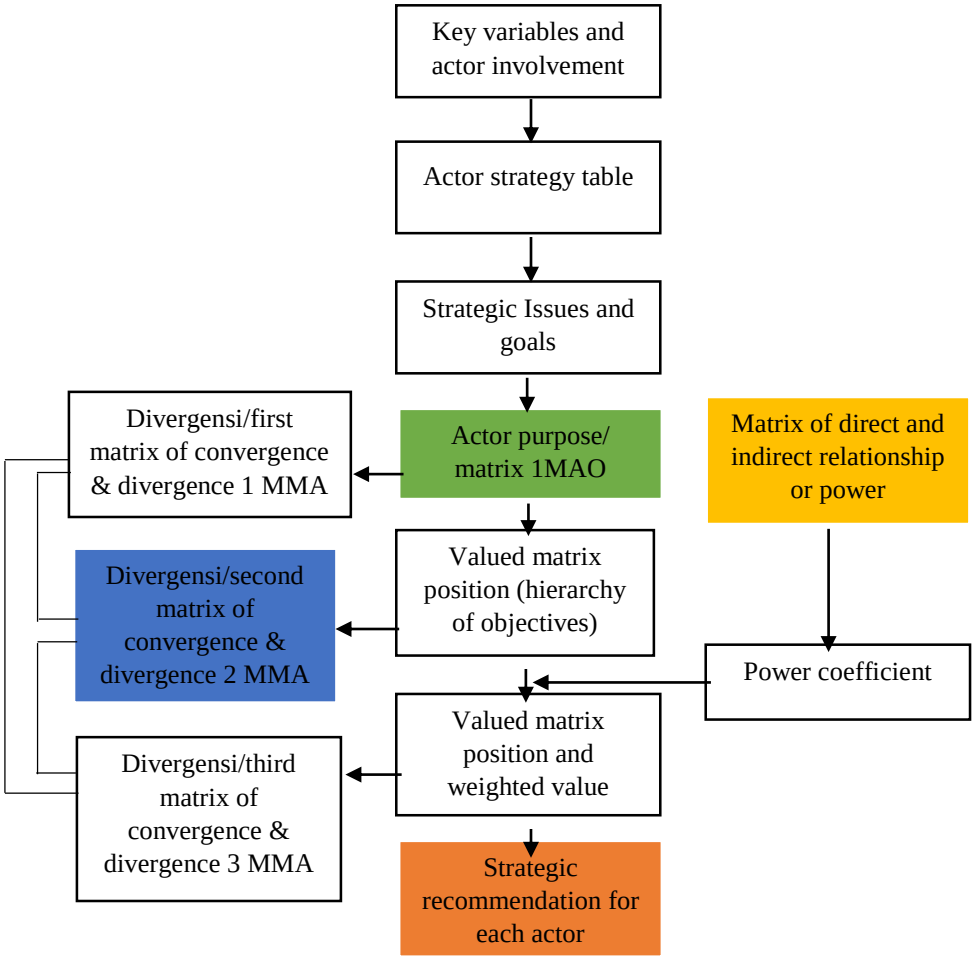
The Matrix of Alliance and Conflict: Tactics, Objectives, and Recommendations (MACTOR) method was developed in response to the increasing criticism made with traditional extrapolation-based forecasting methods. Godet (2000) contributed to this method by further developing the methodology and procedures of MACTOR for use in scenario analysis. The MACTOR method is an analytical method based on an alliance and conflict matrix, which makes better use of the value-added information contained in the principal's strategy table (Godet, 1991).

The MACTOR method performs a thorough analysis of the actors' strategies and initiatives. MACTOR is based on inter-actor influences, attempting to provide a global picture of the importance and likely outcomes of various issues, as well as expected actor strategies, power relations and potential alliances and conflicts. This method is aimed at obtaining the possible evolution of the system being studied in order to build a better and more coherent scenario. The MACTOR method can be used to look at the preferences of each stakeholder and the levels of support for the identified goals (Ahmed et al., 2009). This method also determines the level of support each stakeholder has for each goal and group.

In this study, the MACTOR method will identify all the actors and stakeholders involved in efforts to

implement an integrated and sustainable agriculture in Kopeng Village, Semarang Regency. After the actors are identified, they can be grouped based on their respective roles, so that it will be known whether the actor is included as a main actor, key actor, or supporting actor. In this study, the MACTOR analysis is also used to explain the relationships and interactions between actors. In general, the MACTOR analysis follows the framework developed by Goded (1991) as shown in Figure 1.

The MACTOR method has been applied to various situations involving many actors and issues such as supporting decision makers to identify and choose between strategic options (Fauzi, 2010). The issues identified in this study include the problems of the agricultural sector and the interrelationships between stakeholders in Kopeng Village, Semarang Regency.



Source: Godet, 1991

Figure 1. Analysis Framework Using MACTOR

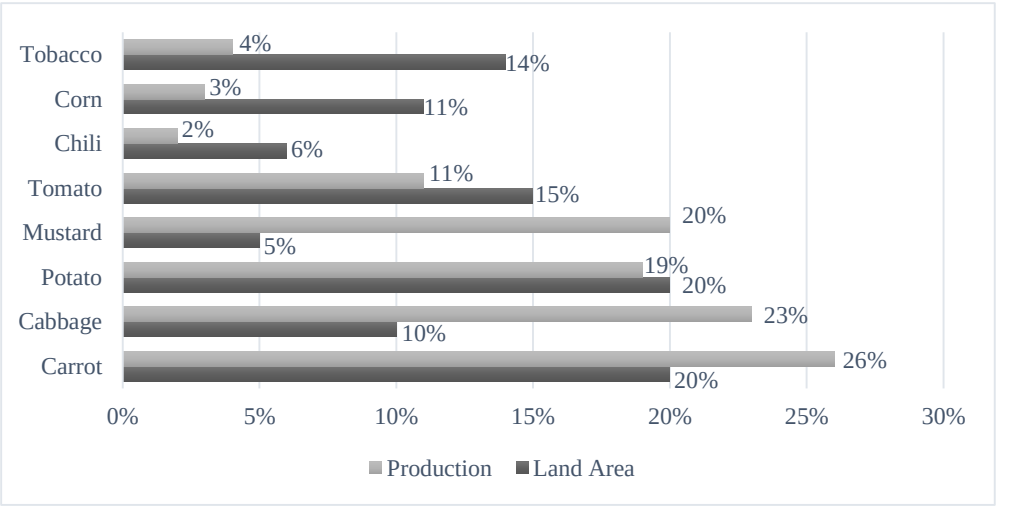
RESULTS AND DISCUSSION

Descriptive Analysis of Horticultural Agriculture Potential and Problems in Kopeng Village

The agricultural sector has an important role in contributing to the economy in Central Java, which ranks third after the manufacturing and trading industries, restaurants, and hotels (Central Bureau of Statistics, 2021). Agriculture in a broad sense is not just agriculture concerning food crops and horticulture, but also includes plantations, forestry, fisheries, and animal husbandry. People who live in the highlands in general are more likely to plant horticultural crops due to the relief of the land and the favorable climate. One of the villages in Central Java that has the potential for horticultural agriculture is Kopeng Village, which is located in Getasan District, Semarang Regency**.**

Kopeng Village is located in a mountainous area, namely Mount Merbabu, Mount Telomo, and Mount Andong. With unique geographical conditions and a humid climate, it has strong potential for cultivation of horticultural crops. The horticultural land area in Kopeng Village reaches 281 ha or 66% of the total land area, with production reaching 155.7 tons/ha (2%). In detail, the horticulture potential in Kopeng Village can be explained by the graph in Figure 2.

Based on Figure 2, it can be explained that the highest horticultural potential is carrots with production reaching 26% or about 45 tons/ha of total production in Semarang Regency. The commodity with the second largest potential is cabbage with production reaching 23% or about 38 tons/ha of total production in



Source: Agricultural Census, 2013

Figure 2. Land Area and Horticultural Agricultural Production in Kopeng Village

Semarang Regency. When viewed from the frequency of planting, each commodity has a different frequency of planting as presented in Table 1.

As Table 1 explains, each horticultural commodity has a different planting and harvesting period. When viewed from the frequency of planting, the average horticultural commodity has a planting frequency of 3 times per year, while chili and corn only have a planting period of 1 time per year. When viewed from the frequency of harvesting, chili has the highest frequency of harvesting per planting, which is 15-20 times. The farmers in Kopeng Village have a strategy to increase agricultural productivity by using a variety of cultivation systems, namely monoculture, intercropping and mixed cultivation. This strategy is applied to optimize land use in order to increase agricultural productivity. This monoculture cultivation system is carried out by planting only one type of plant at a time on the same land. Monoculture cultivation systems are usually carried out by vegetable farmers, such as those growing broccoli and carrots. Meanwhile, tobacco farmers mostly use the intercropping system, considering that tobacco plants take up little space, so that other crops can be planted between the tobacco plants, even if they produce fruit.

As a village that has abundant potential in the agricultural sector, the majority of people living in the village work as farmers. The number of farmers in Kopeng Village has reached 1,227 people. The majority of farmers in Kopeng Village cultivate their land using labor from their own families in order to minimize production costs in terms of labor, but there are also those who use labor from other people.

Horticultural agriculture in Kopeng Village has great potential for development. The growing period of horticultural commodities tends to be short, which benefits farmers in generating income and a faster turnover of money. In addition, land

Table 1. Frequency of Planting and Harvesting Horticultural Commodities in Kopeng Village

No.	Commodity	Planting Frequency Within 1 Year	Frequency of Harvesting in One Planting
1	Carrot	2	2
2	Cabbage	3	1-2
3	Potato	3	1
4	Mustard	3	3
5	Tomato	3	5
6	Chili	1	15-20
7	Corn	1	1-2

Source: Processed primary data, 2021

requirements for horticultural commodities are also flexible and not very specific. When viewed from its marketing potential, horticultural commodities have high market demand which tends to be consistent so that they have very good market potential. Horticultural agricultural products in Kopeng Village are not only distributed and marketed in the Semarang Regency area but also outside the area such as in Magelang, Magetan, Temanggung, and others.

However, behind the potential of horticultural agriculture in Kopeng Village, there remain many obstacles and problems that must be addressed immediately as mentioned in Figure 2.

As illustrated in Figure 2, the agricultural sector in Kopeng Village still faces various obstacles and problems in both upstream and downstream processes. From the upstream side, problems that remain include high production costs, difficulties in accessing capital, low competence of human resources, a volatile climate, and the dependence of the cultivation system on chemical fertilizers and pesticides. Meanwhile, from the downstream side, problems include fluctuating prices, the perishable nature of horticultural commodities, dependence on middlemen, the lack of post-harvest innovation, and knowledge of conventional marketing models.

The high potential of horticulture in Kopeng Village has not been able to overcome the economic conditions of the Kopeng Village community. The agricultural sector does have an important role in the community's economy. Apart from being a provider of food products and a source of income, the agricultural sector is also

Source**:** Processed primary data, 2021

Figure 3. Agricultural Problems in Kopeng Village

a sector that provides a multiplier effect for the village economy. Although Kopeng Village has local wisdom in agriculture, it is not able to prosper the lives of the local people. The high cost of production in the agricultural sector makes it difficult for farmers to access capital. In addition, horticultural commodities that tend to be perishable causes their selling prices to drop if they are not immediately sold, especially when there is a big harvest, there will be oversupply, such that the selling price of the harvest falls freely and this of course harms the farmers.

Actors in Agribusiness-based Farmer Empowerment with A Sustainable Integrated Farming System Approach

Efforts to empower agribusiness-based farmers with a sustainable integrated farming system approach requires collaboration and synergy from several relevant stakeholders or other actors. These stakeholders come from local government groups, village governments, communities, entrepreneurs, farming organizations, and non-profit organizations. Involvement of these stakeholders occurs under the following considerations:

1) These stakeholders and actors have the authority to develop the agricultural sector in Kopeng Village
2) These stakeholders and actors will be affected by the empowerment of agribusiness-based farmers with a sustainable integrated farming system approach
3) These stakeholders and actors are prerequisites for success in the development of the agricultural sector in Kopeng Village

Table 2. Stakeholder/Actor Mapping

No	Stakeholder/Actor	Issue	Objective/Purpose
1	Organic Farmers	Empowerment of agribusiness-based farmers with a sustainable integrated farming system approach	**Economic Aspects:**
2	Non-Organic Farmers		1. Farmer's Income
3	Women's Farmers Group		2. Production Increase
4	Vegetable Agent		3. Efficiency and Competitiveness
5	Agricultural Processing Industry		**Social Aspects:**
6	Vegetable seller		4. Economic equity
7	Farmers		5. Equitable Agribusiness Opportunities
8	Department of Agriculture		6. Poverty Reduction
9	Agricultural Extension		**Environmental Aspects:**
10	Village Apparatus		7. Reducing the use of chemical fertilizers and pesticides
11	Non-governmental organizations		8. Preservation of biodiversity

Source: Primary Data, 2021

4) There are stakeholders and actors have the competence to empower agribusiness-based farmers with a sustainable integrated farming system approach

Based on these considerations, the stakeholders and actors who are the sources of data in this study are as shown in Table 2.

Table 2 illustrates the mapping of actors involved and interested in empowering agribusiness-based farmers with a sustainable integrated farming system approach, consisting of 11 actors. The composition of the actors involved in the empowerment shows heterogeneous characteristics and the involvement of cross-sectoral, cross-governmental organizations and non-governmental institutions. These actors are entities that have an interest and have a role in mobilizing their resources to influence the empowerment of farmers in Kopeng Village. An understanding of the relationships between actors in farmer empowerment is required in order to understand the efforts and strategies of agribusiness-based farmer empowerment with a sustainable integrated farming system approach in Kopeng Village. To understand the relationship between actors and stakeholders in empowering farmers the MACTOR software was used. The subsequent relationships between actors in empowering farmers in Kopeng Village is presented below.

Mapping Relationships Between Actors in Agribusiness-Based Farmer Empowerment with a Sustainable Integrated Farming System Approach in Kopeng Village

A comprehensive understanding of the relationships between various actors in supporting the development of the fisheries sector in Banten Bay begins with mapping of the relevant relationships. The results of the processing of the influence data between actors with the MACTOR tool can be seen in Table 3 below, which shows the Matrix of Direct and Indirect Influence (MDII). Numbers in column Ii indicate influence scores, while numbers in row Di indicate dependencies between actors.

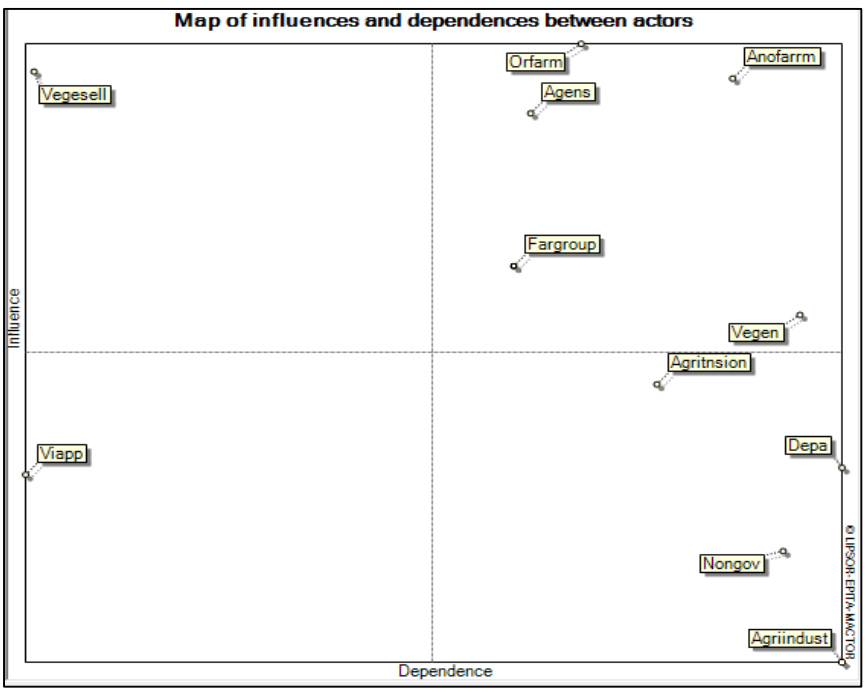
Table 3 shows that the stakeholders with a high influence in empowering agribusiness-based farmers with a sustainable integrated farming system approach are organic farmers, with a score of 213; non-organic farmers, with a score of 208; and vegetable traders, with a score of 209. Meanwhile, the stakeholders who have the lowest influence are individuals in the agricultural commodity processing industry, with a score of 124.

The stakeholders who have a high tendency of dependence are the processing industry and agricultural services, both with a score of 206. Meanwhile, the stakeholders who have the lowest dependence are village officials. This can also be seen in Figure 3 below which maps the

Table 3. Matrix of Influence and Dependency Between Actors

MDII	Orfarm	Anofarrm	Vegen	Agens	Agriindust	Fargroup	Depa	Vegesell	Agritnsion	Viapp	Nongov	Ii
Orfarm	22	24	26	21	26	20	26	12	22	13	23	213
Anofarrm	22	24	26	20	25	19	25	12	22	13	24	208
Vegen	18	24	20	17	20	17	19	11	18	9	21	174
Agens	20	23	24	21	23	20	24	12	22	13	22	203
Agriindust	14	12	14	14	13	11	15	8	14	8	14	124
Fargroup	19	19	21	19	20	16	21	11	20	11	20	181
Depa	15	17	17	15	17	16	17	11	16	11	17	152
Vegesell	20	24	23	20	23	20	23	13	20	12	24	209
Agritnsion	17	18	18	16	19	16	19	12	17	11	18	164
Viapp	16	15	16	14	17	14	17	11	15	11	16	151
Nongov	14	17	16	13	16	14	17	10	15	8	14	140
Di	175	193	201	169	206	167	206	110	184	109	199	1919

Source: Processed Primary Data, 2021



Source: Processed Primary Data, 2021

Figure 4 Map of Influence and Dependency Between Actors

stakeholders in influence and dependency quadrants.

Based on Figure 3, it can be seen that the actors who have the highest influence and dependence in agribusiness-based farmer empowerment strategies with a sustainable integrated farming system approach include organic farmers, inorganic farmers, vegetable agents, farmers' groups, and also women's farmers' groups**.**

Actor's Preference to Goals

The actor preference matrix for goals, presents the preferences of actors involved in efforts to empower farmers in Kopeng Village towards the expected goals or targets which are included in three aspects, namely economic aspects, social aspects, and environmental aspects. Economic aspects include increasing income, increasing productivity, increasing efficiency and competitiveness. Social aspects include economic equality of the community, equitable distribution of agribusiness opportunities, and poverty reduction. Environmental aspects include reducing the use of chemical fertilizers and pesticides, and conserving biodiversity. The degrees of actor mobilization and objectives are presented in Table 4.

Table 4 contains the Matrix Actors-Objective 2 (2 MAO), which presents the position of each actor regarding each target or objective (objective) by considering the degree of opinion of the actors on the competitiveness targets and the hierarchy of targets. There are two outputs of this matrix. The first is the degree of mobilization which explains

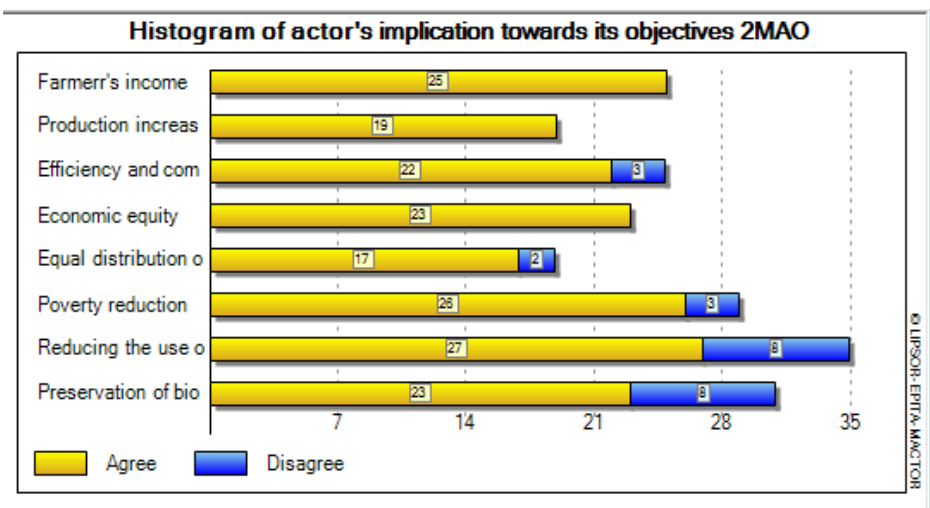
Table 4. Degree of Actor Mobilization and Goals

2MAO	Farinc	Prodincrea	Effcompe	ecoequity	Edustriagr	Poreduc	Redcemipes	Prebio	Absolute sum
Orfarm	2	4	3	4	3	2	4	4	26
Anofarrm	3	3	4	2	4	4	-4	-4	28
Vegen	4	4	1	0	3	4	3	4	23
Agens	3	0	-3	3	2	3	-4	3	21
Agriindust	1	3	2	2	-2	-2	3	2	17
Fargroup	2	1	4	0	0	4	2	-4	17
Depa	1	0	0	3	0	0	2	0	6
Vegesell	2	2	3	2	3	4	2	2	20
Agritnsion	4	2	2	3	1	3	4	3	22
Viapp	0	0	0	2	0	-1	4	2	9
Nongov	3	0	3	2	1	2	3	3	17
Number of agreements	25	19	22	23	17	26	27	23	
Number of disagreements	0	0	-3	0	-2	-3	-8	-8	
Number of positions	25	19	25	23	19	29	35	31	

Source**:** Processed Primary Data, 2021

the goals or objectives that most move the stakeholders or actors. Second, is mobilization which explains the actors who are most mobilized to use resources to achieve these objectives or goals.

The degree of mobilization (bottom row) indicates which goals are expected to be the main issues which provoke stakeholder reactions. In an effort to empower farmers in Kopeng Village, the issues of greatest concern are reducing the use of chemical fertilizers and pesticides (35), biodiversity conservation (31), poverty reduction (29) and increasing farmers' incomes (26). Meanwhile, the most mobilized actors are non-organic farmers (28), organic farmers (26) and vegetable traders (21). These actors are the actors who are most actively mobilized in answering problems in empowering farmers in Kopeng Village. Figure 4 shows the preferences of the actors on the issues and goals in empowering farmers in Kopeng Village. Based on the perception mapping between the actors, it can be further explored that the objective of the area is to achieve little resistance or rejection from some actors. Nevertheless, more actors agree with the targets to be achieved in empowering agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village. Objections that exist, include the distribution of agribusiness (processing industry and vegetable traders) with an agreement score of 17 and a disagreement score of 2; reducing the use of chemical fertilizers and pesticides (organic farmers and processing industries) with an agreement score of 27 and a disagreement score of 8; and increased efficiency and competitive-ness (vegetable agent) with an agreement score of 22 and a disagreement score of 3. These



Source: Processed Primary Data, 2021

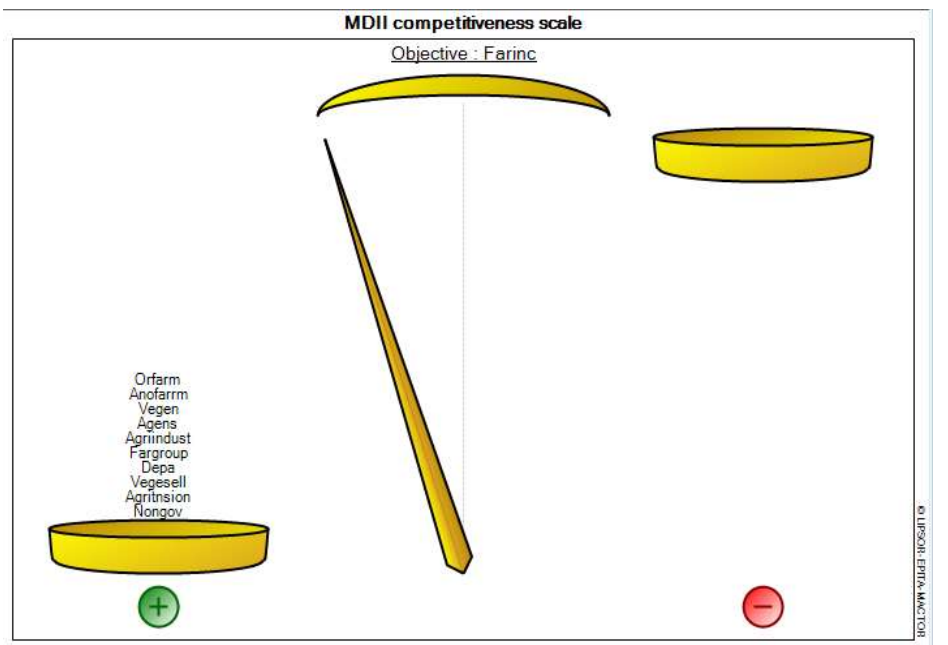
Figure 5. Histogram of Actor's Perception of Goals

various rejections arise because the stakeholders concerned feel that the goals to be achieved in empowering farmers can interfere with the achievement of the business they are currently running.

The mapping of actors who agree and disagree with the goal of empowering agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village can be seen in the picture of the scales between actors and goals in Figure 5.

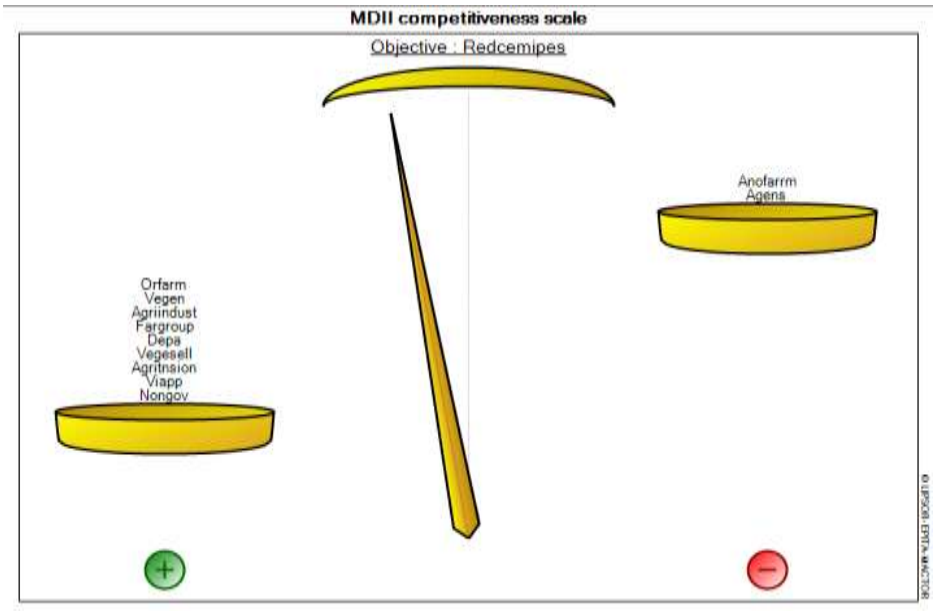
Figure 5 shows the "scales" of agreeing and disagreeing actors for conservation purposes. Actors and stakeholders who agree with the conservation goals are on the "scales" + sign (positive), while actors who reject the conservation goals are on the "scales" – (negative). The "scales" analysis for the aim of increasing farmers' income shows that all actors agree that one of the goals to be achieved in agribusiness-based farmer empowerment with a sustainable integrated farming system approach in Kopeng Village is to increase farmers' incomes.

In Figure 6, it can be seen that the analysis of "scales" for the aim of reducing the use of chemical fertilizers and pesticides includes several actors who disagree, namely inorganic farmers and vegetable agents. This is because inorganic farmers still depend on chemical fertilizers and pesticides for the productivity of their horticultural agriculture.



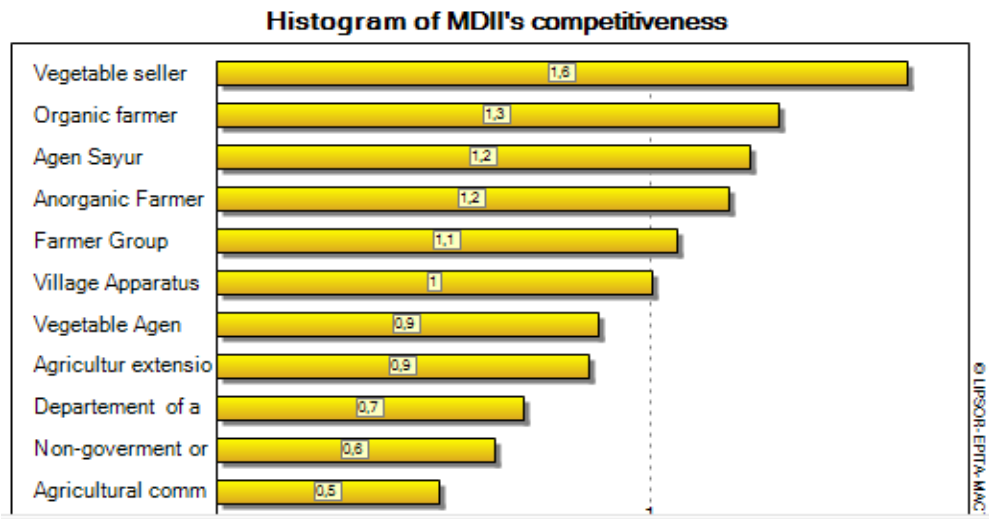
Source: Processed Primary Data, 2021

Figure 6. Balance between Actors and Goals of Increasing Farmers' Income



Source: Processed Primary Data, 2021

Figure 7. Balance between Actors and Goals of Reducing Use of Chemical Fertilizers and Pesticides



Source: Processed Primary Data, 2021

Figure 8. Actor Competitiveness

Actor Competitiveness

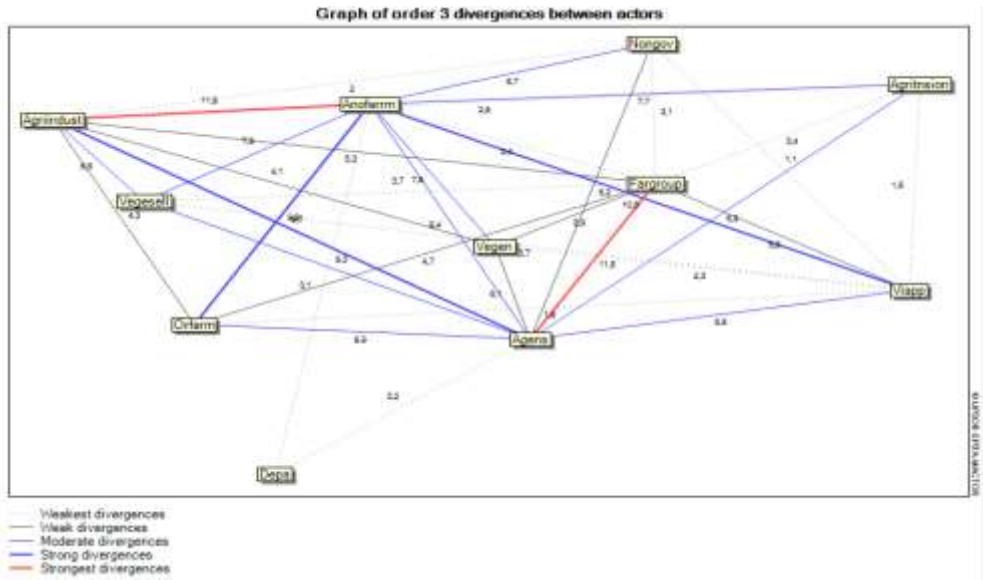
To see the competitiveness of the actors, we can look at Figure 8. This table describes the competitiveness of actors as indicated by the level of direct and indirect influence of the actors on other actors in empowering farmers.

Based on Figure 8, it can be seen that actors who have high competitiveness include vegetable sellers (1,6), organic farmers (1,3), and vegetable agents (1,2). These actors have an important role both directly and indirectly in empowering agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village. Meanwhile, the actor who has the lowest competitiveness is the agricultural commodity processing industry**.**

Potential Conflict Between Actors

Analysis of potential conflicts between actors aims to determine the actors with the greatest possible conflict in their interactions in empowering farmers in Kopeng Village. The results of the analysis of potential conflicts between actors can be seen in Figure 9.

Figure 9 shows that in an effort to empower agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village, a conflict of interest has the potential to arise. The activities of the actors that are most powerful in causing conflict are non-organic farmers, farmers' groups, vegetable agents and the agricultural commodity processing industry. This actor has the potential to create strong divergences. In addition, the actors who are also prone



Source: Processed Primary Data, 2021

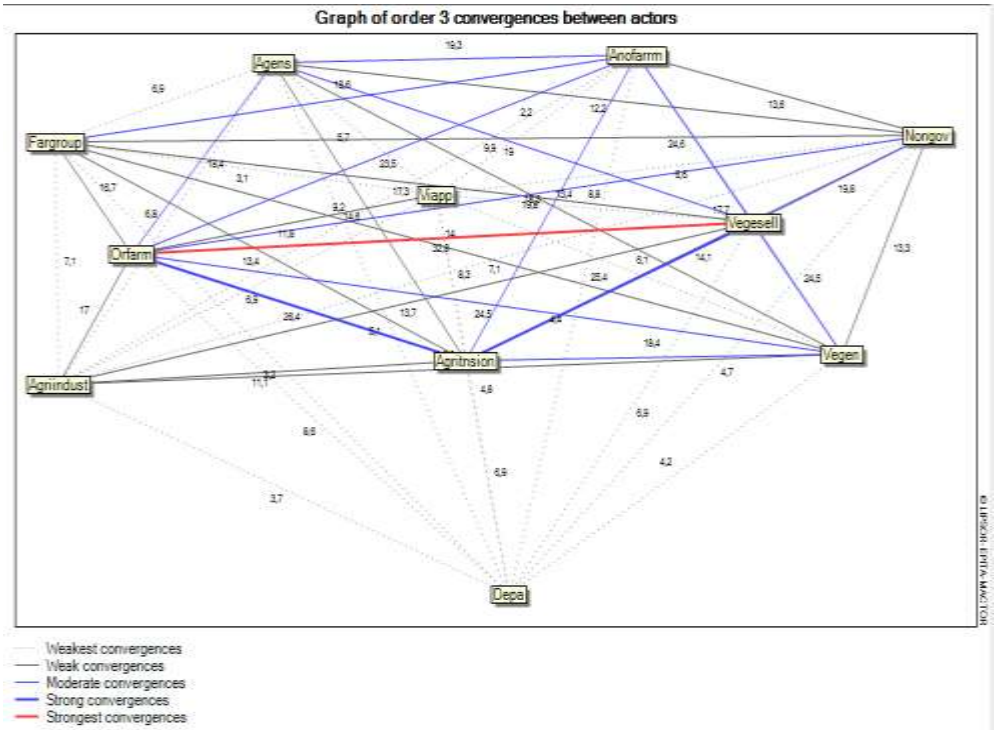
Figure 9. Inter-actor Divergence Matrix

to conflict with other actors such as farmers' groups, are organic farmers and the processing industry. In implementing the empowerment strategy, it is therefore necessary to prioritize a participatory approach and in-depth discussion so that potential conflicts that may arise can be minimized.

Potential Cooperation Between Actors

Empowerment of farmers in Kopeng Village requires synergy and collaboration between actors. The potential for collaboration and cooperation between actors can be seen from the degree of convergence between actors as shown in Figure 9.

Figure 10 explains that the degree of convergence (agreement and agreement) between actors in empowering farmers in Kopeng Village generally tends to be moderate. Based on the objectives and their role in mobilizing resources, the actors can be mapped with the "strongest convergences" who have the most important role in empowering farmers. The actors with the strongest convergence are organic farmers and vegetable traders. Organic farmers must be able to become influencers for inorganic farmers who are still farming inorganically so that they are willing to switch to organic farming,



Source: Processed Primary Data, 2021

Figure 10. Convergence Matrix between Actors

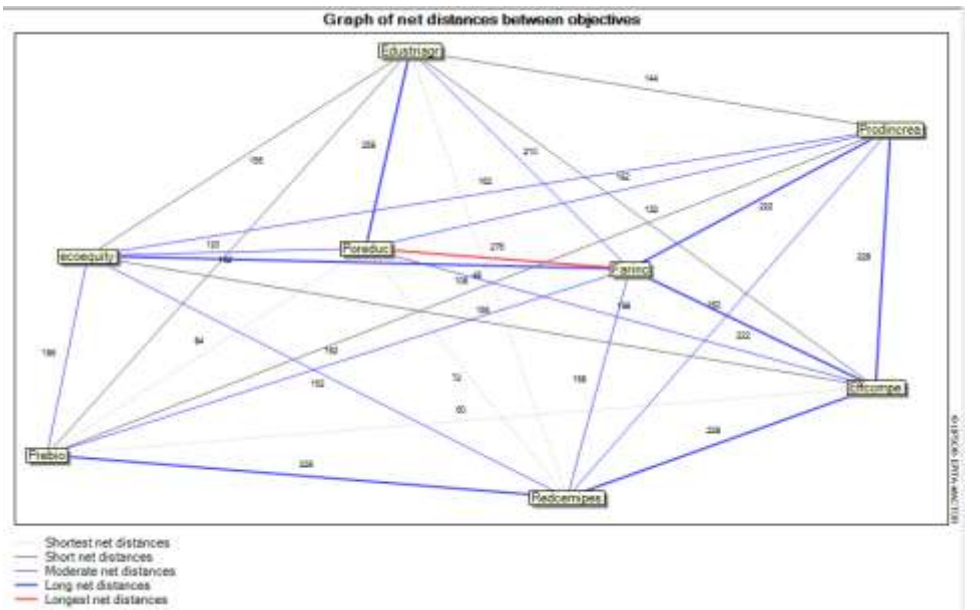
as currently the majority of farmers in Kopeng rely on inorganic farming.

The very important role of these actors will be supported by actors who are in the "strong convergences" category consisting of inorganic farmer actors, non-governmental organizations, women's farmers' groups, vegetable agents, farmers' groups, and agricultural extension workers.

Graph of the Distance Between Goals (Map of Net Distances Between objectives) in Empowering Farmers in Kopeng Village

A map of net distances between objectives is used to identify goals for which actors take the same position (either for or against). This graph maps the objectives with respect to the scale value. Difference between the value of the convergence matrix and the value of the divergence matrix is shown in Figure 11.

The image of the distance between the goal of empowering farmers based on integrated and sustainable agricultural systems presented in Figure 11 provides an overview of the relationships between the program objectives. Possible levels of closeness that occur between destinations are depicted in red and blue. The red colour indicates a stronger relationship distance than the blue colour. Based on the figure, the objectives of the farmer empowerment program that have the



Source: Processed Primary Data, 2021

Figure 11. Graph of Distance Between Destinations

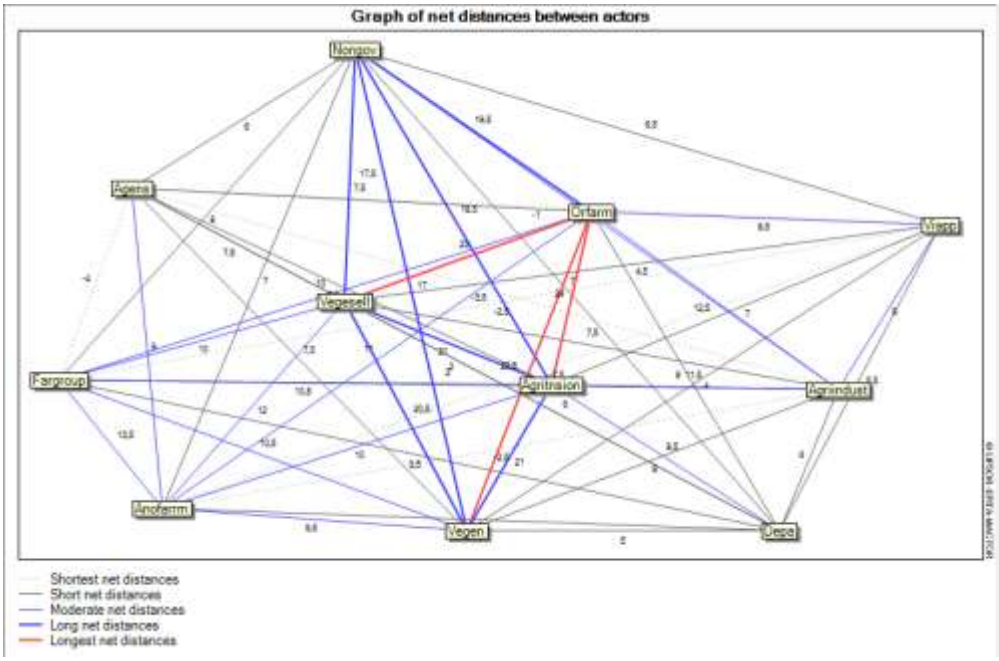
strongest relationship are increasing farmers' income and reducing farmer poverty. From these results it can be explained that the urgency of efforts to empower farmers is to be able to increase their income so that it helps them to escape the trap of poverty.

There is a strong link between the goals of empowering farmers, increasing farmers' income and reducing poverty.

Graph of the Distance Between Actors (Map of Net Distances Between Actors) in Empowering Farmers in Kopeng Village

The distance between actors gives an idea of the possibility of cooperation between actors. Possible levels of cooperation between actors are depicted in red and blue. The red colour indicates a stronger distance which allows for stronger cooperation. The distance graph between actors can be seen in Figure 12.

The distance relationship between actors in empowering farmers in Kopeng Village shows a very strong relationship (shown in bold red). This shows the strong linkages between these actors in empowering agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village. The actors who have a very strong relationship are organic farmers, women's farmers' groups, vegetable traders, and agricultural



Source: Processed Primary Data, 2021

Figure 12. Graph of Distance Between Actors

extension workers. As explained in the research of Haryanti et al., (2017) agricultural instructors are stakeholders who have an important role in empowering farmers as they are directly related to farmers in the field. Meanwhile, research by Sumarti et al., (2017) explains that farmers are the most strategic actors in conducting farmer empowerment programs so that policy directions must be focused on farmers. However, Iryana's research (2018) explains different results, where efforts to empower farmers should focus on existing farmer groups so that the programs that are run can be well organized. Empowering agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village is not an easy thing; it requires the formulation of the right strategy.

Based on the results and previous discussions, an agribusiness-based farmer empowerment model with a sustainable integrated farming system in Kopeng Village can be arranged as follows:

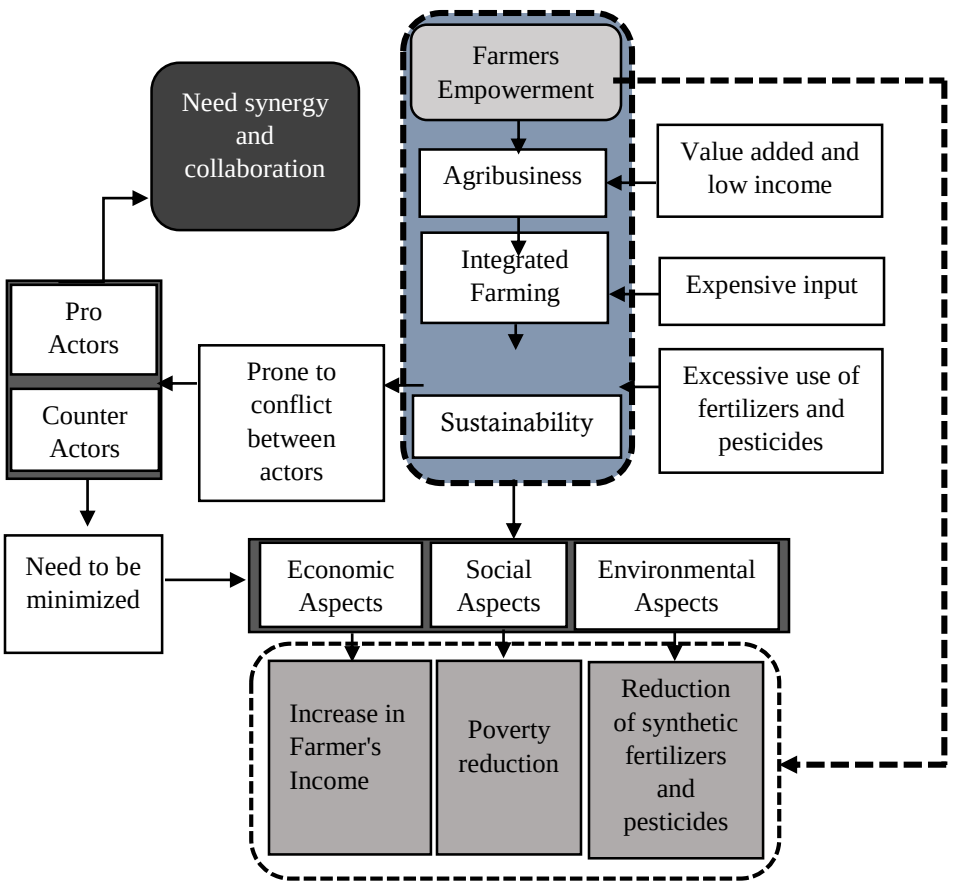


Figure 13. Agribusiness-Based Farmer Empowerment Model with a Sustainable Integrated Farming System

Figure 13 explains that the effort to empower farmers in Kopeng Village based on agribusiness with a sustainable integrated farming system approach is considered as very important in terms of urgency. The concept of agribusiness must be promoted as agriculture in Kopeng Village has not been able to provide equally distributed welfare for local farmers as there are still many farmers trapped in poverty. This problem is caused by the fact that local agricultural commodities have low added value and ultimately lead to low farmer incomes. The concept of an integrated farming system should be promoted as the implementation of existing agriculture requires expensive input costs and tends to be wasteful, such that agricultural efficiency is not achieved. The implementation of an integrated farming system is expected to make farming more efficient in terms of production input costs. Meanwhile, the concept of sustainability must also be promoted as the implementation of the existing agricultural system relies on excessive use of synthetic fertilizers and pesticides which is damaging to the local environment, biodiversity, and leads to reduction of soil fertility. Additionally, the portrait of agricultural land on the slopes of the mountains causes agricultural land to be prone to erosion.

Based on the results of the analysis, it was found that efforts to empower agribusiness-based farmers with a sustainable integrated farming system approach will not be easy as it is likely to be prone to conflict between stakeholders. The conflict that has the strongest potential is the conflict between organic farmers, inorganic farmers, and vegetable traders. This conflict has the potential to arise against the background of inorganic farmers who are not fully prepared to reduce their use of synthetic fertilizers and pesticides. The reason for this is that agricultural yields in the current system are lower if only organic fertilizers and pesticides are used. Meanwhile, another conflict that is prone to emerge is the conflict between vegetable traders and farmers, for the reason that, the selling price of organic agricultural commodities, which tends to be expensive, is expected to affect the profits of traders. The potential for conflict must be minimized by conducting socialization and assistance via the local government.

Efforts to empower farmers that are carried out with a sustainable concept are expected to provide a multiplier effect in various aspects, including social, economic, and environmental aspects. In the economic aspect, the most important goal is to increase farmers' incomes. In the social aspect, the most important goal is poverty reduction. Meanwhile, in the environmental aspect, the most important goal is to reduce the use of synthetic fertilizers and pesticides.

CONCLUSION

Based on the results and discussion, it can be concluded that

the potential of the agricultural sector in Kopeng Village, Semarang Regency is very abundant and has the opportunity to be developed in order to empower farmers. The existing agricultural potential includes the availability of extensive and fertile land, abundant human resources, and a highly abundant variety of agricultural commodities. Behind this potential, exist various problems. From the upstream side, existing problems include high production costs, difficulties in accessing capital, low competence of human resources, a volatile climate, and the dependence of the cultivation system on chemical fertilizers and pesticides. Meanwhile, from the downstream side, existing problems include fluctuating sales price, the perishable nature of horticultural commodities, dependence on middlemen, the lack of post-harvest innovation, and lack of knowledge in conventional marketing models.

Efforts to empower agribusiness-based farmers with a sustainable integrated farming system approach in Kopeng Village require collaboration and synergy from various stakeholders to achieve the desired goals. The actors with the highest influence are organic farmers, while the actors with the highest dependence are the processing industry and agricultural services. Meanwhile, the actors with the highest influence and dependence include organic farmers, inorganic farmers, vegetable agents, farmers' groups and women's farmers' groups. In an effort to empower farmers in Kopeng Village, the issues of greatest concern are reducing the use of chemical fertilizers and pesticides, reducing poverty, conserving biodiversity, and increasing farmers' incomes. Meanwhile, the most mobilized actors are inorganic farmers, organic farmers, and vegetable traders.

Actors who have high competitiveness include vegetable traders, organic farmers, and vegetable agents. The most powerful actors in causing conflict are non-organic farmers and vegetable agents. These two actors have the potential to create strong divergences. Meanwhile, the actors with the strongest convergence are organic farmers and vegetable traders. Organic farmers must be able to become influencers for inorganic farmers who continue to farm using non-organic methods, such that these farmers become willing to switch to organic farming. Currently the majority of farmers in Kopeng still rely on inorganic farming.

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