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APPLICATION OF ANALYTIC NETWORK PROCESS (ANP) FOR THE IMPACT OF REDUCING PLANTING AREA ON SOYBEAN PRODUCTION OF KENDAL DISTRICT, INDONESIA

NGATINDRIATUN[1], ANGGUN RIZKI FATMASARI[2] and AVI BUDI SETIAWAN[3]

[1]Management Department, Binus Online Learning, Bina Nusantara University, Jakarta, Indonesia.
[2, 3] Economics Development Department, Economics Faculty, Universitas Negeri Semarang, Indonesia.

Abstract

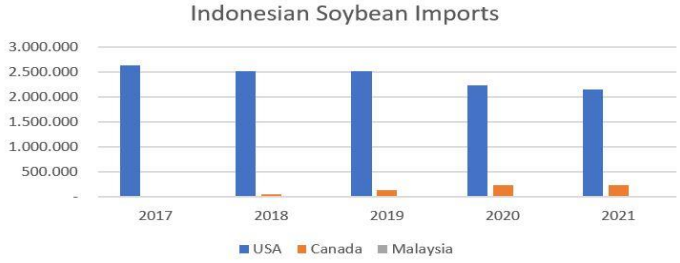
Land is a natural resource that is difficult to increase in quantity, but the demand for land is increasing. Efforts to expand acreage and support soybean production require careful and structured planning. The purpose of this study was to formulate a development strategy to increase the planting area and production of soybean farmers in Kendal, Central Java. Plans can be based on a number of criteria and alternatives that the analytical tool Analytic Network Process (ANP) meets. The survey targets are governments, farmers' group leaders, and farmers. This research was conducted through observations, interviews, and questionnaires. Findings from all sources indicate that alternative land is worth 75 percent of the impact of reducing soybean acreage, while the second priority market value is 25 percent. Impact of acreage reduction on soybean production by the Analytic Network Process (ANP) method as a critically important production factor for increasing yields other than seed and fertilizer.

Keywords: Analytic Network Process (ANP), Decrease in Planted Area, Soybean Production

INTRODUCTION

Indonesia is known as an agricultural country. Countries dependent on the agricultural sector for both livelihoods and development assistance. The population of Indonesia derives from soybeans to meet their needs for their main source of plant protein, so soybeans are her third most important food crop in Indonesia after morning crops and corn. Soybeans are therefore one of the strategically superior raw materials. The demand for soybeans continues to increase year by year, but land area is decreasing due to farmers who grow soybeans. Soybeans are the raw material for tofu, tempeh, soy sauce, etc. Soybean consumption in Indonesia reaches 2.6 million to 2.9 million tons per year, but domestic production can only meet about 6.7% of the demand, or 200.32 thousand tons. To make up the deficit, we still need to import 80% from the US, followed by Canada and Malaysia (Duffy et al., 2021).

Figure.1 Soybean Import Data



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Based on Figure 1, 86% of soybeans are still imported from the United States, then Canada and Malaysia. In 2019 imports amounted to 2,650.90 tons while in 2018 there were 2,585.19 tons so that there was an increase, but in 2020 and 2021 imports amounted to 2,474.48 and 2,390.19 tons so that it decreased. The high import soybean is due to the cheaper price of imported soybeans and the quality is considered above local soybeans supported by the quality and price of imported soybeans which are more friendly to the industry compared to local soybeans. Soybean is a type of legume plant that can be the main source of protein and vegetable oil in the world. The main food crop strategy after rice and corn is soybean (Muchlish Adie & Krisnawati, 2014). Soybean is dubbed as Gold from the Soil, or World`s Miracle because it has amino acid quality with complete, balanced, and high protein, so soybeans make a major contribution in providing nutritious food. The level of Indonesian people's consumption of soybean needs is certain to continue to increase every year, this can be seen from several considerations, one of which is an increase in population, an increase in per capita income, and public awareness of the importance of food nutrition (Obisesan, 2015).

Source: Indonesian Central Bureau of Statistics 2018-2022

Table 1: Central Java Soybean Consumption Data

No	Estimated Food Availability	Soybean Commodity						
		Year						
		2015	2016	2017	2018	2019	2020	2021
1	Production (Ton)	125.467	120.172	150.993	161.494	166.195	170.154	169.245
2	Preparation (Ton)	118.767	113.754	142.930	152.870	157.320	160.234	161.542
3	Needs(Ton)	190.255	340.191	319.779	324.214	324.214	331.765	319.563
4	Consumption per capita(kg/kap/th)	5,8	10	9,4	9,4	9,7	9,5	9,8

Source: Central Java Province Food Security Agency, 2022

Table 1 shows various increases in soybean consumption over the past five years. Demand for soybeans is also increasing year by year and is on a stable trend. Meeting demand for soybeans is driven by production and supply, which are also increasing.

In cultivation to achieve maximum productivity, land is an important element in meeting the basic needs of the community. Central Java is one of the provinces with the greatest potential for national food crops, one of which is the potential for the soybean market to expand and development. However, domestic soybean growth will take longer than soybean demand. The government`s strategy is to meet the domestic demand for soybeans by importing soybeans from other countries. Indonesia has about 60% of soybean land which is in paddy fields and dry land. This situation illustrates that the area planted with soybeans is mostly in areas where the infrastructure is relatively well established and fertile than dry land (Duffy et al., 2021). Some of the problems faced by farmers in Kendal Regency related to food crop cultivation are declining land productivity, prices for factors of production that continue to rise and product prices fluctuate erratically during harvest. The government needs to increase efforts to increase the productivity of agricultural land for food crops to increase the productivity and welfare of farmers (Muchlish Adie & Krisnawati, 2014; Kurniati, 2015; Septiadi et al., 2020).

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Table 2: Harvested Area, Soybean Production and Productivity in Kendal Regency

No	Type	Year						
		2015	2016	2017	2018	2019	2020	2021
1	Harvested Area (Ha)	1.692	1.082	933	1465,5	722,7	1427,4	1234,6
2	Production	3.032	1.340	1.949	2206	1.466	2.106	1.976
3	Productivity	17,92	12,39	20,90	15,10	20,29	14,75	16

Source: Department of Agriculture and Plantation Central Java Province, 2022

Table 2 presents data showing that the soybean acreage harvested/planted experienced a staggering decline from 2018 to 2019 itself, with a fairly steep decline to 74.28%, but production This study is due to the fact that the majority of Kendal's population is farmers, but the reduction in planted acreage would result in changes in the farmer's structure in the Kendal district. This issue raises the idea that an economically relevant study analyzing the impact of reduced acreage could be conducted at the Kendal Regency in Central Java. The aim of this study is expected to be able to improve the economy and food security of Kendal District, Central Java.

LITERATURE REVIEW

Agriculture produces food, livestock, and agro-industrial products using plant and animal resources. In general, agriculture is a human activity that includes farming, animal husbandry, fisheries, and forestry (Biró, Csete, & Németh, 2021). Forms of agriculture in Indonesia:

a) Rice fields are a form of agriculture carried out in wetlands and require much water, irrigated rice fields, lebak rice fields, rainfed rice fields, and tidal rice fields.

b) Moorland is an area with dry land that depends on rainwater irrigation, is planted with seasonal or annual crops, and is separated from the environment around the house. Upland land is challenging to irrigate because the surface is not flat. During the dry season, the dry land will become dry, making it difficult for crops to grow.

c) The yard is a piece of land in the home environment (usually a fence) that is utilized/used for planting crops

d) Shifting Cultivation is an agricultural activity on many lands resulting from clearing forests or shrubs. After several harvests/planting, the Soil is no longer fertile, so it is necessary to move to another land with not been cultivated for a long time.

Benefits of Agricultural Land

Agricultural land has enormous benefits for human survival. The benefits come from the economy and other sectors, such as the environment and biology. Therefore, the increasing number of land use changes that have occurred so far will cause various problems (Ridha, Burhanuddin, & Wahyu, 2017).

Kim (2010) states that the benefits of agricultural land can be divided into two categories (Kim,

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2010). The first is use or usage values, also called personal use values. These benefits result from exploitation or farming activities on agricultural land. The second is non-use values which can also be referred to as intrinsic or innate benefits. Included in this category are various benefits created by themselves, even though they are not the goal of the exploitation activities of agricultural landowners (de Mendonça et al., 2022). From the theory above, it can be seen that the benefits of agricultural land are substantial for the survival of humans and other creatures. A large number of land conversions will disrupt the balance of nature (Mooney & Group, 2015).

Economic Growth David Ricardo

Herzog (2016) explains that David Ricardo's Theory of Economic Growth was developed by David Ricardo (1772-1823) (Herzog, 2016). In general, the outline of the growth process and the conclusions reached by Ricardo are not much different from Adam Smith's theory, which is still concerned with the interaction between the population growth rate and the output growth rate (Paganelli, 2022). In addition, Ricardo also considered that the number of production factors of land (natural resources) could not increase so that, in the end, it would become a "limiting factor" in the process of output growth (Badar Alam Iqbal & Mohd Nayyer Rahman, 2015).

The assumptions in David Ricardo's economic growth theory are that the amount of land is limited, labor will increase or decrease depending on the behavior of nominal wages, capital accumulation occurs if the rate of profit earned by capital owners is above the minimum profit level to attract investment, progress technology is happening all the time, and the agricultural sector is very dominant (Ramoni Perazzi & Merli, 2021).

With a limited amount of land, population growth (labor) will reduce marginal product, known as the law of diminishing returns. As long as the labor force employed on the land can accept wage rates above the natural rate of wages, the population (labor force) will continue to grow. This will further reduce the marginal product of his labor force and, in turn, lower the wage rate (Boushey, 2020).

METHOD

The types of research used are descriptive, qualitative and quantitative approaches. Data collection techniques used in this study were interviews, observations, questionnaires, and documentation. In this study, data will be analyzed qualitatively and quantitatively in a descriptive manner (Christensen, Johnson, & Turner, 2014).. A qualitative descriptive analysis was used to identify the factors that caused the decline in Kendall Regency soybean acreage. Quantitative analysis showed that the decrease in planted area was declustered using the analytical tool ANP (Analytic Network Process), and the software 'Super Decision' was used to derive the strategy to increase the planted area to give an estimated value. Soybean acreage Kendal district. Data analysis using ANP aims to make decisions to obtain the best alternative from multiple alternatives determined using a number of criteria (parameters) developed by Thomas L. Saaty (Chen et al., 2019). This study is an effort to find a solution to solve the

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problem of reducing planted area. We help you prioritize andCC set strategies and make the best decisions considering quantitative and qualitative aspects. The steps of the ANP method are as follows:

1. Modeling stage

Determination of nodes and clusters based on the problem of soybean acreage decline in Kendall Regency to identify and provide an overview of the network model. This was done through discussions with soybean farmers, government facilities and infrastructure experts from Kendall Regency's Food Crops and Horticulture (TPH) division in Kendal Regency to determine the dominance or influence of the elements and the magnitude of the difference on a numerical scale of 1-9.

2. Weight Determination Stage

Determination of the weight of the relationship between nodes and clusters to show the influence of each element on each of the criteria and alternatives that are affected in decreasing the planting area in Kendal Regency.

3. Supermatrix Preparation Stage

Compile a matrix sourced from the key person which is then processed using Super Decision software.

4. Result Analysis Stage

The next step is to determine alternative priorities in order to get the best alternative in reducing soybean planting area in Kendal Regency.

RESULT AND DISCUSSION

a. Kendal Regency Overview

Kendal Regency can be referred to as a district that has an agricultural area. Because of the total land area in Kendal Regency, 75.92 percent is used for agriculture (rice fields, fields, ponds & ponds) and forests and plantations, while the rest is used for yards (land for buildings and the surrounding yard), pastures and gardens. Which is currently not working.

Agriculture is the second contributor to GRDP after the industrial sector, where agriculture is cultivated by residents of Kendal Regency. But in general, many farmers in Kendal Regency have multiple professions, meaning that apart from being farmers they also work as traders or others.

b. Ringinarum District

Ringinarum sub-district has an area of 23.50 km_2, most of which is used for agricultural land of 47.36 km_2 (47.36%), for non-rice field land of 12.07 km_2 (28.09%), and non-agricultural land of 5, 46km_2 (24.55%). The Ringinarum area which is included in the lowlands, currently agriculture is the mainstay sector in the region where most of the majority of the population

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work as farmers. Besides agricultural land in Ringinarum sub-district is fertile land suitable for planting various types of crops such as soybeans, corn, shallots and various types of vegetable crops, and even types of fruit.

c. Kangkung District

Kangkung sub-district is a lowland area with a height of 2 to 5 meters above sea level. There are 15 villages in Kangkung District. The population in Kangkung District in 2015 consisted of 48,016 people, 24,063 male residents and 23,953 female residents.

d. Characteristics of Respondents Analytic Network Process

The Analytic Network Process (ANP) in this study is used to determine alternative priorities to overcome the decline in soybean planting area in Kendal Regency.

Table 3. Characteristics of Respondents in the Analytic Network Process (ANP)

Position	Institution	Gender	Education	Number Of People
Kepala Bidang Lahan	Dinas Pertanian Kabupaten Kendal	Male	College	1
Kangkung Village Government	Kangkung Village Government	Male	Senior High School	1
Ringinarum Village	Ringinarum Village Government	Male	Senior High School	1
Soybean Farmer	Kangung Village	Male	Junior High School	1
Soybean Farmer	Ringinarum Village	Male	Primary School	1

Source: Processed collected by the researcher, 2021

e. Criteria for Impact of Decreasing Soybean Planted Area in Kendal Regency

Based on the results of the study, that the impact of decreasing soybean planting area in Kendal Regency has an effect on the criteria. Price is the main factor affected by the decline in planted area with a value of 57%. Then the production factor criteria with a value of 18.6%. Cultivation criteria with a value of 16.8% and Industry criteria with a value of 7.4%.

Table 4. Order of Priority Criteria for Impact of Decreasing Soybean Planted Areas in Kendal Regency

No	Criteria	Score	Information
1	Factors of Production	0,187	Inconsistency 0,043
2	Cultivation	0,168	
3	Industry	0,075	
4	Price	0,570	

Source: Processed collected by the researcher, 2021

The calculation results of the Analysis Network Process (ANP) in table 4 are the results of calculations by comparing between criteria. At this stage, it is carried out to see the order of

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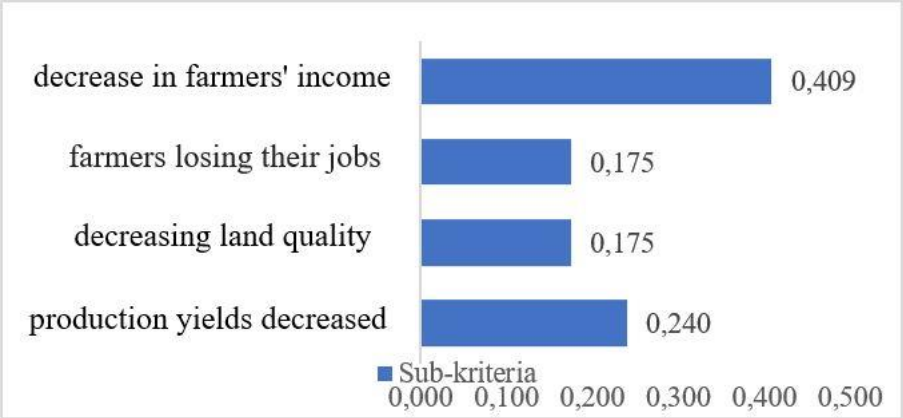
priority on the criteria with the aim of obtaining information regarding the shortcomings and advantages that will later be used to reduce the impact of decreasing soybean planting area in Kendal Regency. Next, describe each criterion based on the most prioritized to the least prioritized into each sub-criteria. Each criterion has several sub-criteria with different priority levels.

f. Unweighted Supermatrix Value

1. Production Factor Criteria

Figure 2. The value of the sub-criteria of the Factors of Production



Source: Processed collected by the researcher, 2021

Based on Figure 2 from the results of the study, the impact of a decrease in soybean planting area in terms of production factors caused a decrease in farmers' income by a value of 40.9%, production yields decreased by a value of 24%, while for farmers losing their jobs and decreasing land quality had the same value, namely 17.5%.

Based on the results of the study, the decline in farmers' income is the main factor in the criteria for production factors. The decline in production factors will also cause a decrease in farmers' income. One of the factors of production here is the planting area, the planting area which is usually cultivated for soybeans is replaced by planting other crops which will affect production yields that fall, and decreased production results will affect farmers' income so that farmers need more supportive production factors to increase production yields. Soybeans in Kendal Regency.

The second priority aspect in the criteria of production factors is the decline in production output. The impact of the decline in soybean planting area is a decrease in production yields in the short term. Production yields fell also because many farmers chose to plant other crops such as green beans, shallots, corn and others. Farmers grow other crops because soybean prices tend to be unstable compared to other crops whose prices are much higher or stable.

The third and fourth priority aspects in the Factors of Production criteria are Farmers losing

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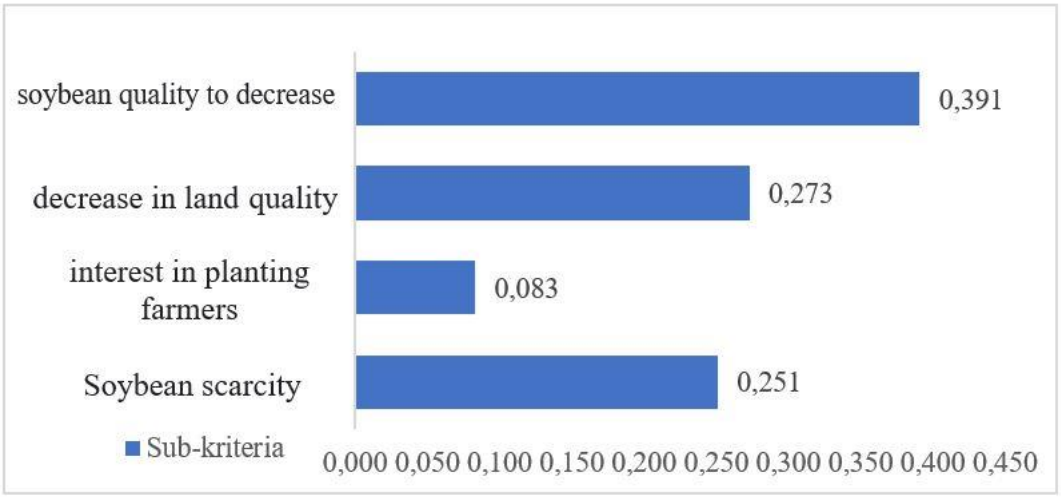
their jobs and declining land quality. Where land quality is influenced by several things, including the scarcity of farmers who want to pay attention to organic farming, many farmers use chemical fertilizers to carry out the cultivation process because it is considered faster.

Farmers lose their jobs, usually this happens when the function of the land changes to non-agricultural. Where farmers turn to look for other livelihoods. Or it could also be due to shifting harvest seasons so that farmers look for other jobs while waiting for harvest time. Farmers then look for other informal sector jobs such as the industrial or service sectors.

2. Cultivation Criteria

Figure 3 Cultivation Factor sub-criteria values



Source: Processed collected by the researcher, 2021

Based on Figure 3 from the results of the study, the impact of decreasing soybean planting area in terms of cultivation causes soybean quality to decrease with a value of 39.1%, a decrease in land quality with a value of 27.3%, Soybean scarcity with a value of 25.1% and the last interest in planting farmers fell by 8.3%. Based on the results of data analysis, it is known that the impact of the decline in soybean planting area is a decrease in the quality of the soybean commodity produced. Soybean quality decreases, usually because the best land is no longer planted with soybeans, farmers no longer focus on growing soybeans and prefer to plant other crops such as corn, onions, and green beans and so on. Where the weather or climate of an area also has an effect. Sufficient soil moisture and relatively high temperatures are needed for soybeans to grow optimally, while in Indonesia, high rainfall during the rainy season causes the soil to become wet continuously and can result in loss or abortion of seeds. In addition, soybean production is carried out during the growing season which is not always ideal for plant growth because it must adapt to cropping patterns and rotations.

The second priority aspect in the cultivation criteria is the decline in land quality. The declining quality of the land itself causes the productivity of plants to decrease. Farmers' attention to organic matters is still lacking. The scarcity of farmers who want to pay attention to organic

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farming also affects the quality of the environment. This causes a decrease in the quality of the planting area due to decreased soil quality thereby reducing crop productivity, where damage caused by natural factors is usually intensive rainfall, where intensive rainfall will cause soybean crop productivity to decrease. Human intervention also dominates over natural factors such as population change, marginalization of the population, land tenure problems, political instability and mismanagement, socioeconomic conditions and inappropriate agricultural development.

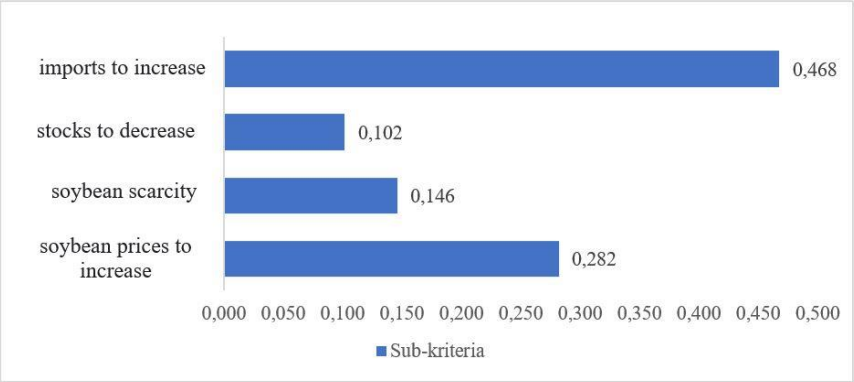
The third priority aspect in the cultivation criteria is the scarcity of soybeans. The scarcity of soybeans here is where the demand for soybeans still relies on imported soybeans, because domestic soybean production is still very lacking so that most soybeans rely on imported soybeans as soybeans for consumption. The development of soybean plants is not only determined by agro-climatic and plant environmental factors, but also by the wishes of the community. The scarcity of soybeans is due to the fact that farmers have not considered soybeans as the main crop, soybeans are still positioned as an intermediary crop for the main crops of rice, corn, sugar cane, tobacco, shallots, green beans or other crops and the declining land has resulted in the scarcity of soybeans because farmers are reluctant to plant them.

The fourth priority aspect in the cultivation criteria is that the farmers' interest in planting decreases. The decreasing interest of farmers in planting soybeans is due to possible considerations regarding the selling price of the harvest which tends to be unstable, farmers prefer to plant other crop commodities that have more market certainty than to plant soybeans. The desire of farmers to grow commodities whose prices are more stable. In addition, farmers also think that soybean plants need extra attention because the swamp is attacked by pests and diseases, therefore farmers are reconsidering planting soybeans.

3. Industry Criteria

Based on the results of the study, Industry is a priority in the impact of decreasing soybean planting area in Kendal Regency.

Figure 4 Industrial sub-criteria values



Source: Processed collected by the researcher, 2021

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Based on Figure 4 from the research results, that the impact of decreasing soybean planting area from the industrial side causes food imports to increase by 46.8%, soybean prices to increase by 28.2%, soybean scarcity by 14.6% and food stocks to decrease by 10.2%.

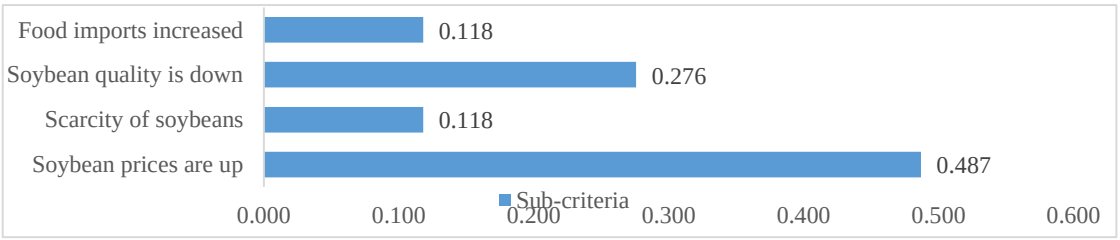
Based on the results of data processing, food imports increased to become the main factor in the Industry criteria. Food imports here are soybean imports, the government must import because local soybean production is decreasing. On the other hand, the demand for soybeans is increasing from year to year. The lack of soybean production by farmers in Indonesia is caused by uncertain soybean prices. In addition to imports carried out to meet domestic needs, imports are also carried out to improve the balance of payments and reduce foreign exchange outflows from other countries the second priority aspect in the Industry criteria is the increase in soybean prices. Price is the second priority factor in the industry criteria, the increase in soybean prices is due to the shrinking planted area which has an impact on decreasing supply. The increase in soybean prices rose due to following the international market, the increase was due to weather uncertainty and inflation of foodstuffs.

The third priority aspect in the industry criteria is the scarcity of soybeans. Indirectly, domestic soybeans are replaced by imported soybeans, because domestic soybeans have a higher price than imported soybeans, which are lower. Where farmers will find it more difficult to compete with imported soybeans in terms of price. Soybean scarcity is also caused by the decrease in the existing soybean planting area, where farmers begin to reduce soybean cultivation because it is considered less profitable. So many farmers choose to grow other crops such as corn and others that are more profitable. The fourth aspect in the Industry criteria is the declining food stock. The food stock in question is the domestic soybean stock. This is because of the scarcity of farmers who grow soybeans so that domestic soybean production has decreased and has not been able to meet the needs of the domestic market, although domestic consumer demand is always increasing, the results of domestic farmers have not been able to meet the needs.

4. Price Criteria

Based on the results of the study, price is the main priority in the impact of decreasing soybean planting area in Kendal Regency.

Figure 4 Price sub-criteria value



Source: Processed collected by the researcher, 2021

Based on Figure 4 from the results of the study, that the impact of decreasing soybean planting area in terms of price causes soybean prices to increase by a value of 48.7%, soybean quality

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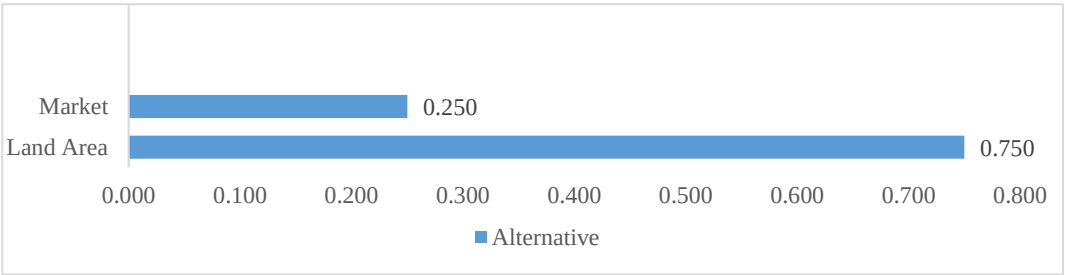
to decrease by a value of 27.6%, as well as food imports to increase and Soybean scarcity is equal to a value of 11. 8%. In the aspect of soybean prices rising is the main priority in the price criteria. The increase in soybean prices usually occurs due to the scarcity of soybeans caused by declining production. Where demand always increases while production decreases, decreased production results are also caused by the declining interest of farmers to plant soybeans. Local farmers are reluctant to plant soybeans due to unstable prices, price stability is necessary to maintain balance in the market.

Furthermore, in the aspect of soybean quality, decreasing is the second priority in the price criteria. The decline in soybean quality will affect the selling price of soybeans, soybean itself is a plant that requires extra care because it is prone to powdery mildew. The decline in the quality of soybeans itself can also be caused by unfavorable weather or climate, causing the quality of soybeans to decrease. The last priority in the price criteria is the aspect of increasing food imports. Food imports here are soybean imports. The minimal local soybean production is in line with the low interest of farmers to grow soybeans. The decline in farmers' interest in planting is due to the selling price of soybeans being too cheap.

5. Soybean scarcity sub-criteria

Based on the results of the study, the scarcity of soybeans is the main factor in the impact of decreasing soybean planting area in Kendal Regency.

Figure 5 sub-criteria value of Soybean Scarcity



Source: Processed collected by the researcher, 2021

Based on Figure 5 the results of the study, land is the main priority in reducing soybean planting area with a value of 75% compared to the market which is the second priority with a value of 25%. The function of land in supporting the activities of human life is quite large, but over time there has been a change in land function. Because of its important function, agricultural land is one of the main resources in agricultural business, land that is used to produce or produce agricultural crops.

6. Land Alternative

Based on the results of the study, it was shown that in Alternative Land, the production yield decreased was the impact of decreasing soybean planting area in Kendal Regency.

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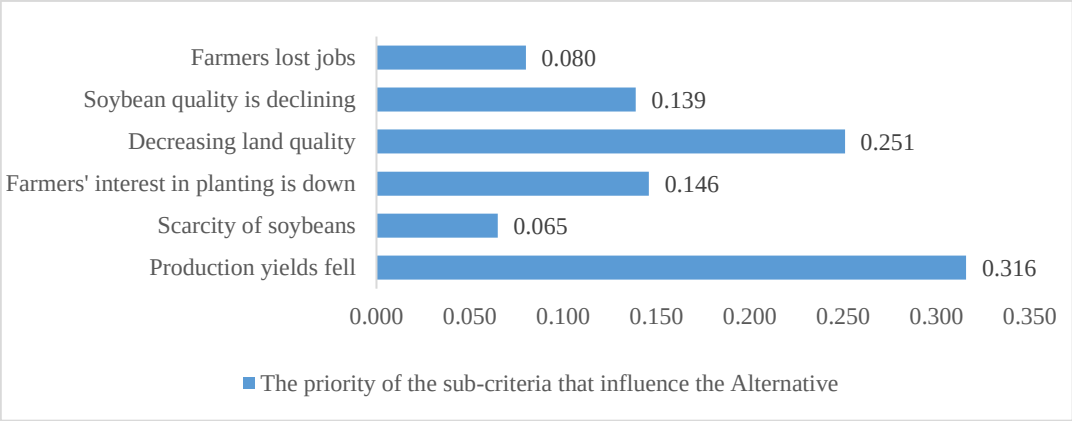
Figure 6 Land Alternative sub-criteria values



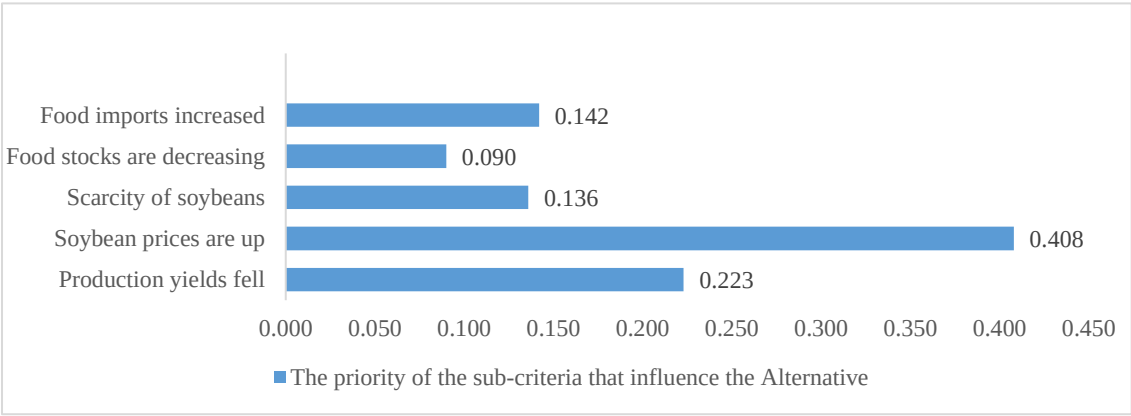
Source: Processed collected by the researcher, 2021

Based on Figure 6, the results of the study show that production yields have decreased to become the main factor affecting alternative land with a value of 31.6%, while the last priority is the scarcity of soybeans with a value of 6.5%. As explained earlier, the decline in production yields was due to a decline in farmers' interest in planting soybeans, which eventually resulted in a shortage of soybeans in the market. The decline in farmers' own interest in planting as a result of unstable soybean prices tends to be lower than other commodities such as corn. Farmers prefer to plant other crops that are considered more profitable.

7. Market Alternative Sub-Criteria

Based on the results of the study, it was shown that in the Alternative Market the price of soybeans rose was the impact of a decrease in soybean planting area in Kendal Regency.

Figure 7 Market Alternative sub-criteria values



Source: Processed collected by the researcher, 2021

Based on Figure 7 the results of the study, soybean prices rose to be the main factor affecting

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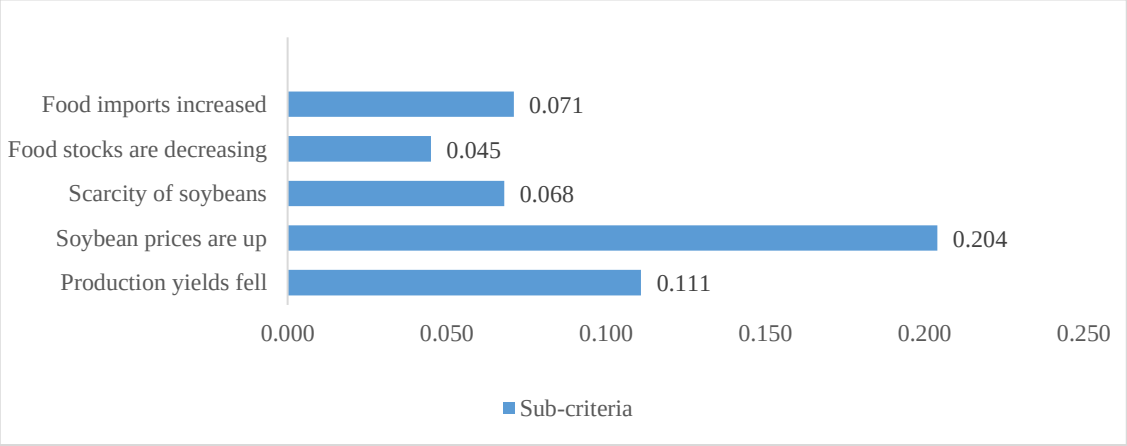
alternative markets with a value of 40.8%. The spike in soybean prices was caused by more visible external factors. The increase in soybean prices was also due to the government not being able to control the price of soybeans entering Indonesia. In addition, the rising soybean prices were also due to the use of soybeans as a substitute for palm oil because the price increased. Food stocks decreased to be the sixth factor affecting alternative markets with a value of 9%. The food stock here is the soybean stock, where farmers have not been able to meet the domestic soybean needs. This is because farmers have not been able to compete in price and quality of soybeans with imported soybeans, which causes many farmers to be reluctant to plant soybeans. Where the price of imported soybeans is considered cheaper, while domestic farmers cannot sell soybeans below the price of imported soybeans because it will cause farmers to experience more losses, so farmers prefer to plant other crops such as corn whose prices are much more stable or higher than soybeans.

g. Weighted Super matrix Value

1. Market Alternative

Based on the results of the study, it was shown that in the Alternative Market, soybean prices rose to be the main factor in the impact of decreasing soybean planting area in Kendal Regency.

Figure 8 Market Alternative sub-criteria values



Source: Processed collected by the researcher, 2021

Based on Figure 8 the results of the study, soybean prices rose to be the main factor affecting the Market Alternative from the value of the Weighted Super matrix with a value of 20.4%. Food stocks declined to fifth with a value of 4.5%. As explained in the results of the Unweighted Supermatrix above, domestic soybean production has not been able to meet market needs.

h. Limit Supermatrix Value

Based on the results of the study, that the decrease in production yields is the impact of a decrease in soybean planting area in Kendal Regency based on the Limit Supermatrix value

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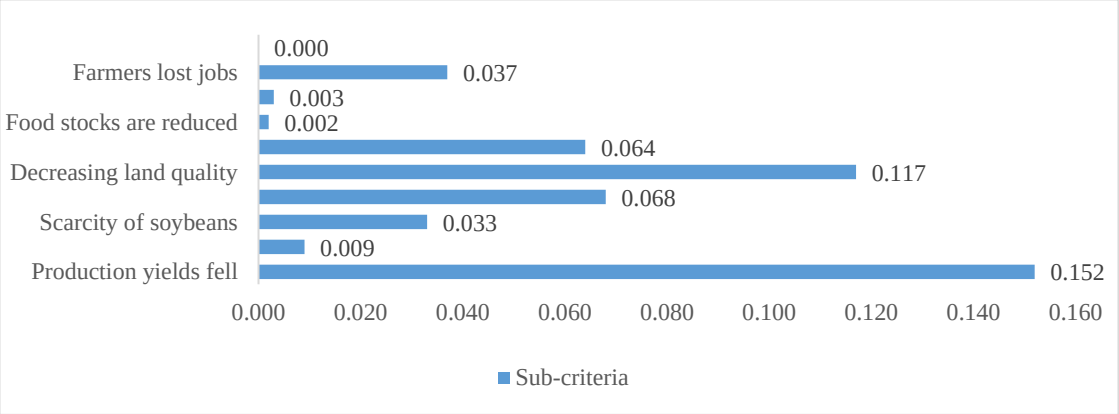
Figure 9 sub-criteria value Limit Supermatrix



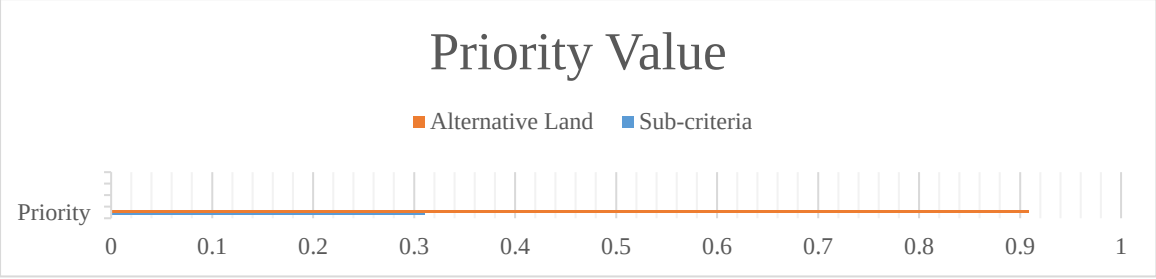
Source: Processed collected by the researcher, 2021

Based on Figure 9 the results of the study show that production yields decreased to be the main factor affecting the decrease in soybean planting area related to a value of 15.2% and the last priority was a decrease in farmers' income with a value of 0%. Where production yields decreased due to a decrease in farmers' interest in planting soybeans, farmers' interest in planting decreased because it was considered that soybean prices were less profitable for farmers, besides that soybean plants needed extra care because they were susceptible to pests.

i. Priority Value

The results of the priority analysis show that, based on the Land Alternative research, it shows the highest priority value of the impact of decreasing soybean planting area with a value of 90.8%.

Figure 10: Results of Priority Value Analysis



Source: Processed collected by the researcher, 2021

Based on Figure 10 the results of the study, obtained the priority value for the sub-criteria, namely the production yield decreased with a value of 31.1% and the priority value of alternative land was 90.8%. Land is a very important production factor to increase production yields other than seeds and fertilizers. The decrease in soybean planting area in Kendal Regency will have an impact on decreasing production yields. Where land is the main factor

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in agriculture. Land subsidence will affect the production yields produced by farmers.

RESEARCH DISCUSSION

Kendal Regency is one of the regencies in Central Java that has a fairly high agricultural potential and the majority of the population of Kendal Regency are also farmers. Based on data according to BPS Kendal district, the agricultural sector which contributes to the second GRDP and every year has increased, indicating that the macro economy of Kendal Regency is dominated by the management industry sector and the agricultural sector. Farmers in Kendal district also face various problems related to the decline in soybean planting area which is included in the food crop category. Where the impact of decreasing the planting area is indirectly related to the problem of food crop cultivation, where many factors affect the decrease in the planting area. Based on the results of the study, it was found that the price criteria became the main priority in reducing soybean planting area in Kendal district with a weight value of 57% compared to the other three criteria, namely production factors with a weight value of 18.7%, cultivation with a weight value of 16.8% and industry. Become the last priority with a weight value of 7.5%.

Price criteria, which is the main priority from the impact of decreasing the planting area with a priority value of 57%. According to Awang (2021) in a narrow sense, price is the amount charged for a product or service, more broadly, price is the sum of all values provided by customers to benefit from owning or using a product or service (Awang et al., 2021; Ningsih et al., 2015; Sultan & Rachmina, 2016; Sahara et al., 2016). Where farmers find it difficult to market agricultural products, farmers also often experience the condition that their products are not sold at a reasonable price.

Factors of production which are the second priority after price. According to Nugroho (2016) that based on its relationship to the level of production production factors are divided into fixed production factors (fixed inputs) and variable production factors (input variables) whether or not production activities exist, the production factors must still exist. Where the production factor itself is worth 18.6% of the total research results and the production factors needed here include planting land, seeds, fertilizers and other infrastructure (Nugroho et al., 2016; Farikin, 2016). Then there are the third and fourth priority criteria, the third priority itself is Cultivation with a priority value of 16.8% of the overall research results. According to Sunjian, cultivation is agricultural development carried out by the community in order to get results that are able to meet basic human needs. Where the agricultural sector is more and more developed in rural areas, this is partly due to the carrying capacity of the village to support the agricultural sector. However, the farmers themselves complain that soybean is one of the plants whose cultivation is quite difficult, because it cannot grow on unsuitable land and the care of the soybean plant itself is quite difficult because it is easily attacked by pests and diseases. Therefore, many farmers have less interest in planting soybeans and instead switch to other commodities such as shallots, peanuts, green beans or corn which are considered easier to maintain and the prices of other commodities are much more stable and tend to rise compared to other crops. Soya bean. Industry criteria become the fourth priority in the impact of decreasing planted area in

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Kendal district with a value of 7.4% of the overall research results. According to Wasis (2018), industry is an economic activity that manages raw materials, raw materials, semi-finished goods and finished goods into goods that have a higher value in use (Wasis, Saharjo, Kusumadewi, Utami, & Putra, 2018; Naftaliasari et al., 2015). Where most of the soybeans produced by farmers are raw materials to be used as return seeds, where production results from farmers are directly purchased by middlemen or distributors in a condition of raw material which causes farmers to be unable to sell at a higher price. From the results of the study, the order of priority of the sub-criteria of the impact of decreasing soybean planting area is as follows: 1) production yields decrease; 2) soybean prices rose; 3) scarcity of soybeans; 4) farmers' interest in planting decreases; 5) declining land quality; 6) soybean quality goes down; 7) food stock is reduced; 8) food imports increased; 9) farmers lost their jobs; 10) decreasing farmers' income.

Based on the results of the ANP, the main priority sub-criteria was obtained, namely the production yield decreased by a value of 31.1%.. The result of production is a product, according to Takahashi (2020), a product is anything that a producer can offer to be noticed, requested, sought, purchased, used, or consumed by the market as a fulfillment of the needs or desires of the relevant market (Takahashi, Muraoka, & Otsuka, 2020; Mulyaninngsih et al., 2018). Decreased production yields for farmers is one of the important things to control because increasing production results will also increase the income received by farmers. The decline in production results is due to the fact that most farmers are reluctant to plant soybeans, and replace them with planting other commodities besides that local farmers cannot compete in price with imported soybeans which are cheaper so that they are in demand by domestic consumers. For the second priority there is a decrease in land quality with a value of 23.9%. Decreased land quality is also called land degradation or damage, where loss of top soil can have a negative effect on soil productivity, although sometimes it can improve soil productivity or even not harm (Wolman 1985 in Obalum et al. 2012). Meanwhile, the decline in land quality is caused by the scarcity of farmers who are willing to pay attention to organic farming which will affect the quality of the environment. The decline in land quality can be prevented by rehabilitation efforts on the soil structure where rehabilitation is also useful for repairing, restoring and improving the condition of damaged land so that can function optimally.

The last or less important sub-criteria priority is decreasing food stock and decreasing farmer's income. Where the food stock decreased by 0.04% of the overall research results and 0% value of the declining income of farmers. The food stock in question is the domestic soybean stock. This is because domestic soybean production has not been able to meet the needs of the domestic market, although consumer demand is always increasing but the results of domestic farmers have not been able to meet the needs. In accordance with the Theory of Population and Growth by Malthus, where the population increases according to geometric progression (2,4,8,16,32, and so on), while food increases arithmetically (1,2,3,4,5,6 etc). As a result, the number of goods and services, including food or food ingredients, is often not balanced with the population, which will result in scarcity. Meanwhile, the decrease in farmers' income occurs when farmers experience crop failure or prices at harvest are low, not in accordance with the costs incurred during planting and post-harvest. From the results of the ANP also obtained the

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results of data processing for the two alternatives for the impact of decreasing the planting area, the alternatives are Land and Market. Where land is the main priority in the alternative with a value of 90.8% of the total research results and the market is the second priority at 9.1%. Agricultural land is land that is intended or suitable for use as agricultural land to produce agricultural crops and livestock. Agricultural land is one or the main resource in agricultural business. According to Purwowidodo (1983) land has the meaning "a physical environment that includes climate, soil relief, hydrology, and plants which to some extent will affect the ability to use land. While the market According to Ehrenberg et al. (2003), is a meeting place between buyers and sellers, where goods or services or products are exchanged between buyers and sellers. The measure of willingness in the exchange will usually appear a price level for the goods and services exchanged.

The production factor in this case is land that affects the economy of an area, where the results of the study reveal that soybean planting in the Kendal area has an impact on decreased production yields, soybean scarcity, farmers' interest in planting decreases, land quality declines, soybean quality decreases, and farmers lose their jobs. Which resulted in a decrease in production because soybeans were scarce. In accordance with the theory of Diminishing Return and Comparative Advantage by David Ricardo, where each country should focus on the problem of production and then sell the goods so that they have an advantage in production, specialization is also needed so that it becomes more efficient so that there is the ability for growth processes and risks can be used. More effectively. For Ricardo, growth is limited by land scarcity.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the results of the ANP analysis, there are four criteria for the impact of decreasing soybean planting area, namely 1) Production results; 2) Cultivation; 3) Industry; and 4) Price. The price criterion is the top priority compared to the other three criteria. Price is the top priority with a weighted value of 0.570. In the second priority there is a production factor with a weight value of 0.186 and for the third and fourth priorities there is cultivation with a weight value of 0.168 and for industry it is the last priority with a weight value of 0.074. The four criteria for reducing soybean planting area resulted in ten sub-criteria including; 1) production yields fall; 2) soybean prices rose; 3) scarcity of soybeans; 4) farmers' interest in planting decreases; 5) declining land quality; 6) soybean quality goes down; 7) food stock is reduced; 8) food imports increased; 9) farmers lost their jobs; 10) decreasing farmers' income. In the cultivation criteria, the main priority is soybean quality which decreases with a weight value of 0.391, the industrial criterion that becomes the main priority is Food imports increase with a weight value of 0.468. The price criterion that becomes the priority of the main sub-criteria is Soybean prices increase with a weight value of 0.487 the main alternative priority is land alternative with a weight value of 0.750

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Recommendations

The government must be able to integrate or involve various parties related to efforts to increase soybean production and increase soybean planting area. Parties such as farmer groups, PPL, and farmers. So that it can increase soybean production and increase soybean planting area in Kendal Regency. It is hoped that the guidance and infrastructure provided by the relevant government can be put to good use. So that it can increase maximum production yields, as well as the use of organic fertilizers to maintain land fertility for long-term agricultural land. Suggestions for further researchers who are interested in conducting research related to the impact of decreasing agricultural planting area can prepare themselves further and collect references about the impact of decreasing planting area, hopefully better research results.

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