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HOW DOES THE AGRICULTURAL SECTOR AFFECT THE ECONOMIC GROWTH OF DEMAK REGENCY?

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Caroline Caroline[1]✉ , Soni Agus Irwandi[2] , Siti Sumiati[3], Sri Umiatun[4]

[1, 4] Universitas Sultan Fatah, Indonesia

[2] Universitas Hayam Wuruk Perbanas, Indonesia

[3] Universitas Sultan Agung, Indonesia

✉ caroline@unisfat.ac.id

Abstract

This research is motivated by the phenomenon that the area of agricultural land in Demak Regency has changed the function of the land, from paddy fields to non-rice fields in the form of housing and industry. Changes in land use are thought to be due to rob, abrasion, land acquisition for the Semarang-Demak toll road. The agricultural sector was originally the leading sector/base sector in Demak Regency, then slowly shifted to the industrial sector. The purpose of this study was to analyze the performance of the agricultural sector in Demak Regency. This research method uses SWOT analysis which has been modified by using the Demak Regency stakeholder questionnaire and spatial data analysis approach using maps processed by GeoDa. The results of the analysis show that from 2017 to 2021, Demak Regency, based on the Klasson Typology, is included in the criteria for a developed but depressed area. This means that the economic growth of Demak Regency is developing in accordance with the existing geographical conditions. The superior agricultural production in Demak Regency is rice, corn, sweet potato, cassava, peanuts, green beans, soybeans, and cassava sorghum. Based on a SWOT analysis with threats to the agricultural sector in Demak Regency in the form of ROB floods, abrasion, reduced use of paddy fields to non-rice fields, prices of agricultural products that do not break even point, Demak Regency policies adopting agricultural intensification strategies, and agricultural extensification policies.

Keywords: Agriculture Sector, Economic Growth, Demak

JEL : O14, Q10 , R58

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INTRODUCTION

This research is based on the phenomenon that the existence of the Semarang-Demak toll road affected Demak Regency, namely the transfer of Demak Regency land area to non-agricultural land area, which refer to the large number of livelihoods of Demak residents who shifted from the agricultural sector to the non-agricultural sector. Presumably this condition affected by the Semarang-Demak toll road construction and the impact of abrasion. This is supported by research from Damaywanti (2023), Fatimah et.al., (2023), and Rahmah and Widyastuti (2021). Damaywanti's showed several results, first, the population dynamics from year to year since the abrasion tended to decrease. It is because of the movements of people due to the loss or destruction of their residential land which has become the sea (permanently flooded). Second, the economic communities who originally worked in the agricultural sector (agriculture, aquaculture) experienced a change, both in their livelihood and in their earnings. Third, their culture is a Javanese religious culture that will be retained, although some of them are lost due to the separation of the village by the sea because of the abrasion. Fourth, people who live there still want to remain living there although the intensity of residential sustainability abrasion is not recommended. Meanwhile results of Fatimah et.al., (2023) concluded that the value of land in the Semarang - Demak toll road construction area from 2022 to 2023 will increase in every radius. Supported by Rahmah and Widyastuti (2021) that showed the construction of the Semarang Demak Toll Road was feasible economically and financially.

Demak Regency is included in the strategic area of the National Activity Center (PKN) as a part of the Kedungsepur Region (Kendal – Demak – Ungaran - Semarang–Salatiga - Purwodadi). Agricultural development in Demak Regency is inseparable from the population of 14 sub-districts in Demak Regency, and the agricultural sector of Demak Regency became the base sector, namely the food crops sub-sector in 2011 (Khatimah, 2013).

The figure 1 shows that the Mranggen sub-district has the largest population, namely 176,603 people, while the Keboangung sub-district has the least population 41,244 people.

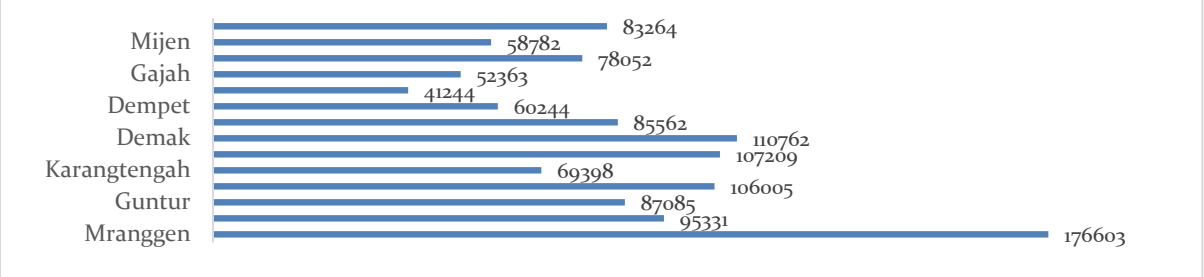

Figure 1. Total Population of Demak Regency, 2021
Source: Demak in Figures 2022

Meanwhile, figure 2 shows that the percentage of the population of Demak Regency in 2021 who live in rural areas mostly works in the agricultural sector, which is 29 percent, while the number of urban residents in 2021 who works in agriculture is only 17 percent.

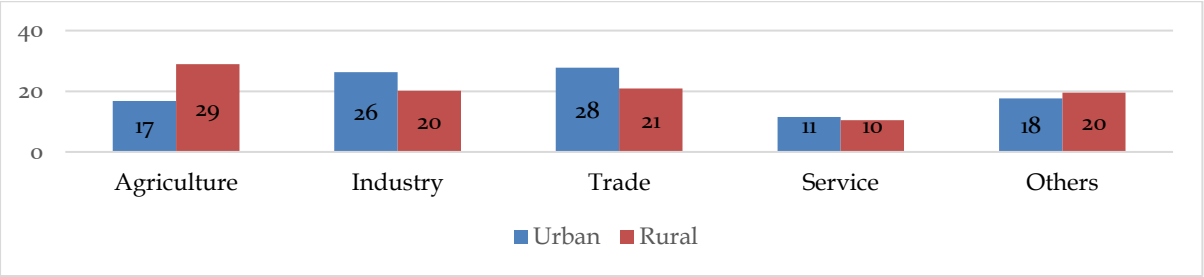

Figure 2. Number of Population Aged 15 and Over Based on Employment in Demak Regency, 2021
Source: Demak in Figures 2022

Demak Regency has two agricultural areas, namely a food crop area and a horticultural area. The Demak Regency food crop area has an area of approximately 56,763 ha spread across all sub-districts and a sustainable food area of approximately 56,530 ha which is included in the food crop area and horticultural area with an area of approximately 1,556 ha. The fisheries area in Demak Regency consists of capture fisheries and aquaculture where pond cultivation has a total area of approximately 6,062 ha spread across Sayung, Karangtengah, Bonang, Mijen and Wedung Districts. Meanwhile, capture fisheries include capture fisheries facilities and development of fisheries processing.

The use of paddy fields is important in the management of agricultural products. The use of paddy fields in Demak Regency from 2019 to 2021 has experienced a change in function which is suspected to be due to areas affected by the construction of the Semarang-Demak toll road, and areas affected by abrasion. Table 1 shows the area of paddy fields in Demak Regency. Most of the land in Demak Regency in 2021 is paddy fields (58.7%). Non-paddy agricultural land consisting of dry fields/gardens, ponds and private forests occupies 23.13% of the total area, while the remainder (18.0%) is used for housing, industry, trade and offices as well as other public infrastructure.

Table 1. Land Use, Area Based on Land Use of Demak Regency in 2017-2021

Years	Land Use			Total Land Area
	Rice field	Non Field Agri culture	Non Agri culture	
2017	52,178	21,646	15,919	89,743
	58.1%	24.1%	17.7%	
2018	52,178	21,646	15,919	89,743
	58.1%	24.1%	17.7%	
2019	52,347	21,120	16,276	89,743
	58.3%	23.5%	18.1%	
2020	53,597	18,938	17,208	89,743
	59.7%	21.1%	19.1%	
2021	52,761	20,759	16,223	89,743
	58.7%	23.1%	18.0%	
Average	58.6%	23.2%	18.1%	

Source: District Food Agriculture Office. Demak (2021)

Research on the performance of the agricultural sector in Demak Regency is very important to do to support the sustainability of the carrying capacity of the agricultural sector in Demak Regency for the food needs of the people of Central Java. The purpose of this study was to analyze the Performance of the Agricultural Sector in Demak Regency. The contribution of this research is to provide information about investment opportunities in Demak Regency, especially investment to solve problems that occur in the agricultural sector of Demak Regency due to flooding, robberies, abrasion, and the impact of the construction of the Semarang-Demak toll road.

This is reinforced by the results of research from Mustopa and Santosa (2011) which shows that overall, both population, industry and GRDP have a positive effect on the amount of land conversion. However, only the variables of population and number of industries were proven to be significant. The variable GRDP amount was proven to be insignificant. From analysis using graphic methods, it can be seen that the number of land conversions in Demak Regency tends to increase from year to year. From this analysis it can be seen that the conversion of land is used for residential areas and the construction of factories for the industrial sector.

This is supported by the results of research from Janah et.al., (2017) which shows that in Demak Regency there has been an increase in applications for land conversion permits. There was a decrease in agricultural land area from 2,136 ha to 1,417 ha on average or 12.4% in Sayung District due to land conversion. The factors that influence the conversion of agricultural land in Sayung District are economic needs (41%), Hajj (16%), business (11%), medical treatment (9%), debt repayment (8%), respectively. house renovation (4%), motorbike purchase (4%), inheritance division (4%) and land exchange (3%). Land conversion very significantly affects the number of people who have agricultural land, the size of land ownership, job transfers and family food supplies.

Most of the Demak Regency area is located in a former swamp basin area so it has the characteristics of muddy soil. During the rainy season, some areas in Demak Regency are easily flooded and during the dry season the land becomes cracked and experiences drought. Demak Regency is flowed by a number of rivers which also contribute to the potential for flood disasters. These rivers include: the Wulan River which passes through Karanganyar, Mijen and Wedung Districts; Cabean River which passes in Karangawen and Mranggen Districts; Cabean River which passes in Dempet, Karangtengah, Demak and Bonang Districts; Dolok River which passes in Guntur and Sayung Districts; and a number of other rivers.

Research on abrasion in Demak Regency was carried out by Irsadi et.al., (2022)

with the research results showing that there has been a beach abrasion on the coast of Sayung, Demak, covering 262.74 hectares and an accretion of 5.87 hectares spread across four villages , namely Sri Wulan and Bedono Timbulsloko, and Surodadi. Prevention and evaluation are needed to be related to abrasion and the factors triggered so that abrasion on the coast of Sayung, Demak can be shrunk.

THEORETICAL BASIS

This theory adopts the economic growth model of Solow (1956) in the form of Cobb Douglas about the production function.The production function shows the highest output that the company can produce for each specific combination of inputs (Pyindyck dan Rubinfeld, 2012). Companies can turn inputs into outputs in various ways, using various combinations of capital, labor and materials. The production function shows the highest output q for firms, or Q for industries. Each company will combine inputs. Companies can use inputs widely. (Pyindyck and Rubinfeld, 2012) focuses on production inputs on capital (K) and labor (L), namely the production function:

$q = F\ (.L)$.....(1)

The form of the production function is mathematically $q = F\ (K, L)$, the form of the Cobb-Douglas production function $q = AK^{\alpha}L^{\beta}$ where q is the level of output, K is the quantity of capital, and L is the quantity of labor. A, α and β are positive constants (Pyindyck and Rubinfeld, 2012).

Cobb-Douglass Function Assumptions is α < 1 and β < 1. Companies can experience decreasing marginal products from capital and labor. The marginal production of labor $MP_L = \partial[F\ (K, L)]/\partial L = \beta AK^{\alpha}L^{\beta}$, if MP_L decreases, then L increases. If α+ β=1 the company has constant returns to scale. If α+ β>1 company increasing returns to scale. If α+ β<1 the company decreases returns to scale (Pyindyck dan Rubinfeld, 2012).

The company's decision to produce has three steps (Pyindyck and Rubinfeld, 2012: 201):

1) Production Technology
   How are production inputs (labor, capital, and natural resources) transformed into outputs?
2) Cost Constraints
   Companies must take into account the prices of labor, capital, and other inputs. Consumers are limited by budget constraints, while companies are limited by their production costs.
3) Input Choices
   The choice of production technology inputs, the price of labor, the price of capital, and the price of other inputs, companies must choose how much input is used to produce output. Consumers will take into account the prices of different goods when deciding how much to buy. Companies will take into account the

prices of different inputs when deciding how much of an input to use.

RESEARCH METHODS

This research uses SWOT analysis from Ramaloo *et.al.,* (2018). The novelty of this research is using a modified SWOT analysis, namely SWOT analysis using the Strategic Plan from the Demak Regency Tourism Office by considering input from stake holders, namely 1 Demak resident, 1 person from the Demak Regency Agriculture Service, 1 person from the Demak Regency Bappeda, 1 community leader, 1 person from a practitioner, 1 person from a Non-Governmental Organization, with the support of a map that uses the Euclidean Distance spatial weight matrix to determine spatial interaction patterns.

Next, the analysis uses a spatial data analysis approach using maps processed by GeoDa subversion version 1.20.0.36 which was released on February 2023. The spatial interaction method adopts the spatial interaction pattern model with Eucledian distance from Caroline (2022).

This research uses a spatial weight matrix method with Euclidean Distance by entering a map of Central Java into the GeoDa subversion 1.20.0.20 program which was launched on July 2022 to find out the x coordinate points and y coordinate points from 29 regencies and 6 cities in Central Java Province to find out spatial detection patterns.

Table 2. SWOT Matrix

IFE → EFE ↓	Strength –S Take note of internal strengths	Weaknesses-W Note internal weaknesses
Opportunity-O Make note of existing external opportunities	Strategy SO List of strengths to take advantage of existing opportunities	Strategy WO Register to minimize weaknesses by taking advantage of existing opportunities
Threats-T Take note of existing external threats	Strategy ST List of strengths to avoid threats	Strategy WT List to minimize weaknesses and avoid threats

Source : Ramaloo *et.al.,* (2018).

Table 3. Space Weight Matrix with Euclidean Distance

Regency/City	X Coordinate Point	y Coordinate Point
Cilacap Regency	108,89	-7,49
Demak Regency	110,63	-6,91
Grobogan Regency	110,93	-7,12
Banjarnegara Regency	109,66	-7,35
Banyumas Regency	109,18	-7,46
Batang Regency	109,86	-7,02
Blora Regency	111,39	-7,07
Boyolali Regency	110,65	-7,42
Brebes Regency	108,93	-7,06
Magelang City	110,22	-7,48
Jepara Regency	110,77	-6,55
Karanganyar Regency	111,02	-7,66
Kebumen Regency	109,62	-7,65
Kendal Regency	110,16	-7,04
Klaten Regency	110,62	-7,69
Magelang Regency	110,25	-7,50

Pati Regency	111,04	-6,74
Salatiga City	110,50	-7,74
Pekalongan City	109,68	-6,89
Semarang City	110,39	-7,02
Surakarta City	110,82	-7,56
Tegal City	109,12	-6,87
Kudus Regency	109,62	-7,06
Pekalongan Regency	109,40	-7,04
Pemalang Regency	109,40	-7,04
Tegal Regency	109,16	-7,03
Temanggung Regency	110,14	-7,06
Wonogiri Regency	110,99	-7,26
Wonosobo Regency	109,91	-7,42
Purbalingga Regency	109,41	-7,32
Purworejo Regency	109,97	-7,71
Rembang Regency	111,46	-6,78
Semarang Regency	110,47	-7,27
Sragen Regency	110,97	-7,39
Sukoharjo Regency	110,83	-7,68

Source: processed data, 2024 (Caroline, 2024)

RESEARCH RESULTS AND DISCUSSION

The agricultural sector provided a large contribution after the contribution from the Processing Industry Sector from 2017 to 2017. in 2021 there is Rp. 556.78 billion towards the economic growth of Demak Regency from 2017 to 2021, namely Rp. 426.19 billion.

Figure 3 shows that the population aged 15 years and over with primary school education mostly works in the service sector with 236,479 people, followed by the agricultural sector with 98,095 people, and the manufacturing sector with 67,007 people. Residents 15 years and over who graduated mostly worked in the service sector 35,192 people, 4,599 people in the manufacturing sector, and 456 people in the agricultural sector. The livelihood of 58.85% of the people of Demak Regency works in the agricultural sector. Demak Regency is drained by 12 rivers, namely the Serang River; Wulan River; Kenceng River; Loben River; Jajar River; Old Tuntang River; Jragung River; Setu River; Dolog River; Dalema River ; Mondoliko River; Baboon River

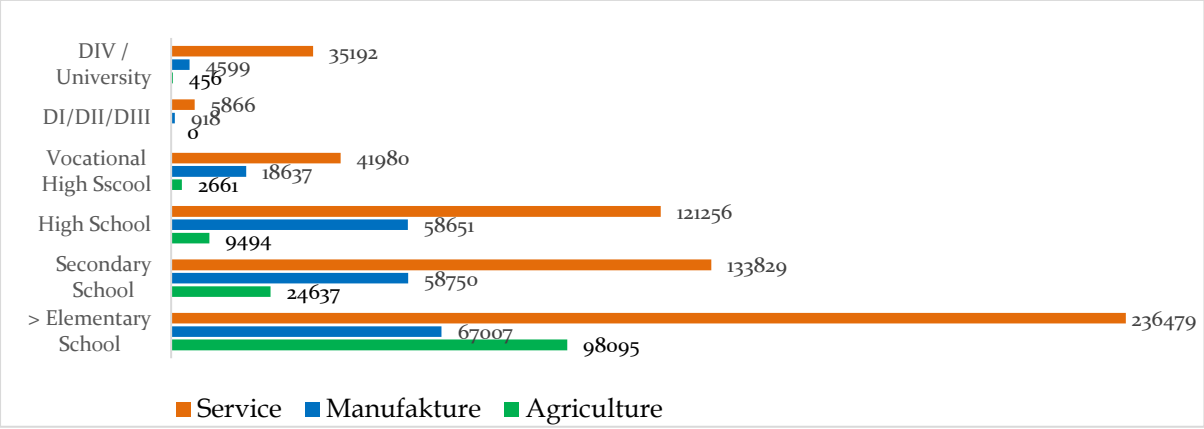

Figure 3. Working Population According to Highest Education in Demak Regency in 2021
Source: Demak in Figures 2022

Figure 4 shows that most of the workforce working in the agricultural sector in 2021 will be workers with non-permanent status of 49,527 people, followed by unpaid workers of 40,147 people.

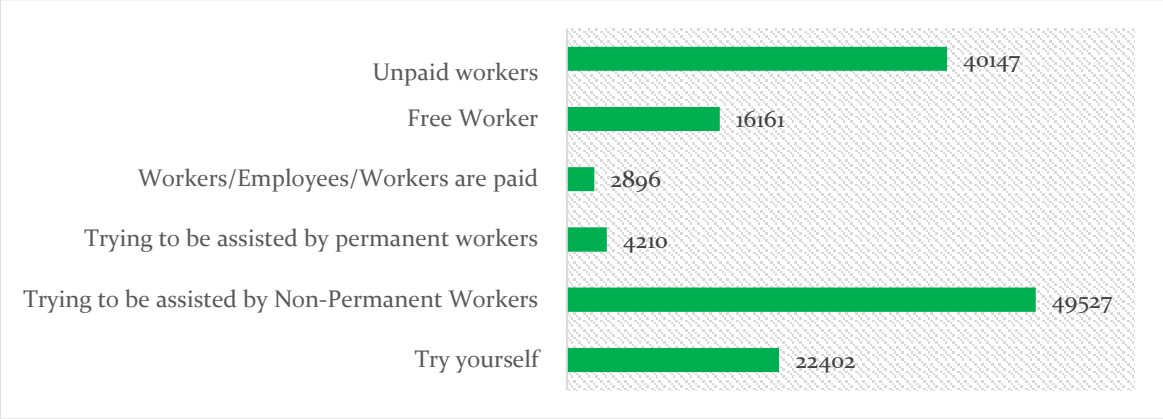

Figure 4. Residents of Demak Regency Working in the Agricultural Sector Based on Employment Status (2021)
Source: Conditions of the Central Java Workforce 2021

Main Sector Analysis of Demak Regency

Demak Regency has 5 leading sectors. This is evidenced in Table **3**. which results in a calculation of **Location Quotient** (LQ) > 1 from 2017 to 2021 that the leading sectors of Demak Regency are:

1. Agriculture, Forestry and Fisheries Sector.
1. Water Procurement Sector Waste Management and Recycling.
2. Wholesale and Retail Trade Sector; Car and Motorcycle Repair.
3. Defense Government Administration Sector and Compulsory Social Security.
4. Other Services Sector.

The results of the LQ calculation show that the agricultural sector is the basis (leading) sector in Demak Regency. So that this sector can be said to be the sector that is the basis of the economy in Demak Regency. This sector can be developed by the Government of Demak Regency.

Table 3 identifies that the agricultural sector is the leading sector in Demak Regency in 2017, 2018, 2020 and 2021. The agricultural sector in Demak Regency in 2019 is not included in the leading sector. This is allegedly because farming activities at the beginning of the 2019 Covid-19 pandemic did not work in Demak Regency.

Table 3. Location Quotient (LQ) Calculation Results 2017 -2021

No	Sector	LQ				
		2017	2018	2019	2020	2021
1.	Agriculture, Forestry and Fisheries	1.63	1.61	0.74	1.55	1.51
2.	Mining and excavation	0.20	0.20	0.20	0.17	0.16
3.	Processing industry	0.87	0.89	0.90	0.87	0.90
4.	Procurement of Electricity and Gas	0.95	0.94	0.94	0.87	0.92
5.	Procurement of Water Waste Management and Recycling	1.05	1.08	1.08	1.05	1.04
6.	construction	0.79	0.79	0.80	0.96	0.92
7.	Wholesale and Retail Trade; Car and Motorcycle Repair	1.15	1.16	1.17	1.14	1.14
8.	Transportation and Warehousing	0.08	0.84	0.83	0.88	0.88
9.	Provision of Accommodation and Food and Drink	0.69	0.69	0.68	0.70	0.69
10.	Information and Communication	0.54	0.54	0.54	0.55	0.57
11.	Financial Services and Insurance	0.87	0.88	0.89	0.86	0.87
12.	Real Estate	0.72	0.72	0.72	0.71	0.70
13.	Company Services	0.68	0.67	0.66	0.65	0.68
14.	Government Administration of Defense and Compulsory Social Security	1.25	1.26	1.26	1.23	1.25
15.	Education Services	0.98	0.99	1.00	0.97	1.00
16.	Health Services and Social Activities	0.84	0.84	0.84	0.81	0.84
17.	Other Services	1.67	1.64	1.64	1.62	1.65

Source: Results of calculations for Demak Regency in Figures for 2020-2021

Table 4 identifies that the average economic growth of Demak Regency from 2017 to.d. 2021 is 3.83 percent above the average economic growth in Central Java Province of 3.32 percent.

Table 4. Economic Indicators for Demak Regency and Central Java Province 2017 - 2021

Indicator	2017	2018	2019	2020	2021	Average
Demak Economic growth rate (%)	5,82	5,40	5,56	-0,23	2,62	3,83
Central Java Economic Growth Rate (%)	5,26	5,30	-2,65	3,32	5,36	3,32
GRDP Per Capita of Demak (Billions of Rupiah)	0,015	0,015	0,016	0,015	0,016	0,015
GRDP Per Capita Central Java (Billions of Rupiah)	0,026	0,027	0,029	0,026	0,027	0,027

Source: Central Java in Figures 2022

Figure 5 identifies that from 2017 to 2021 Demak Regency based on the Klasson Typology is included in the criteria for an Advanced but Depressed Region.

PDRB per Capita / Economic Growth Rate	PDRB Per Capita Demak > Income Per Capita Central Java	PDRB Per Capita Demak < Income Per Capita Central Java
Demak's Economic Growth Rate > Central Java's Economic Growth Rate	Fast Growing Areas	Fast Developing Area
Demak's Economic Growth Rate < Central Java's Economic Growth Rate	**Developed but Depressed Region** Demak Regency	Relatively Disadvantaged Regions

Figure 5. Regional Typology of Demak Regency According to Klasson in 2017 to.d. year 2021
Source: Central Java in Figures 2022

Demak Regency Sectoral Shift Share

Table 5 identifies that the agricultural sector of Demak Regency made a large contribution after the contribution from the Processing Industry Sector from 2017 to 2017. in 2021 there is Rp. 556.78 billion towards the economic growth of Demak Regency from 2017 to 2021, namely Rp. 426.19 billion. The growth of the agricultural sector from 2017 to 2021 is positive, namely 3.54 percent, with positive sectoral changes progressing, but the competitiveness of the Demak Regency agricultural sector has negative growth.

Table 5. Demak Regency Sectoral Shift Share 2017 - 2021

No	Sectors	*Regional Share*	Sectoral Growth	Competitive Growth	Sectoral Change
1.	Agriculture Forestry and Fishing	426.19	3.54	**(238.92)**	190.82
2.	Mining and Quarrying	8.05	**(0.57)**	**(11.61)**	**(4.13)**
3.	Manufacturing	556.78	90.20	398.93	1.045.91
4.	Electricity and Gas	2.12	0.39	**(0.27)**	2.24
5.	Water Supply; Sewerage Waste Management and Remediation Activities	1.42	0.31	**0.45**	2.18
6.	Contructions	161.64	58.31	293.56	513.51
7.	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	410.72	**(42.40)**	**(864.92)**	**(496.61)**
8.	Transportation and Storage	69.02	**(20.22)**	**(64.33)**	**(15.54)**
9.	Accommodation and Food Service Activities	48.02	6.67	**(4.50)**	50.19
10.	Information and Communication	49.14	33.18	57.93	140.25
11.	Financial and Insurance Activities	45.75	5.90	6.17	57.82
12.	Real Estate	26.45	3.33	**(2.11)**	27.66
13.	Business Activities	4.87	0.92	1.31	7.10
14.	Public Administration and Defence; Compulsory Social Security	64.83	3.82	3.59	72.24
15.	Educations	78.09	12.83	4.63	95.55
16.	Human Health and Social Work Activities	14.62	4.31	4.58	23.51
17.	Other Services Activities	51.84	5.02	**(3.01)**	53.85

Source: Processed data (2022)

SWOT Matrix

The Strengths-Weaknesses-Opportunity-Threats (SWOT) matrix is an important matching tool to assist the Demak District Bappeda in developing four types of strategies. The four types of strategy in question are:

- SO Strategy
- WO (Weakness-Opportunity) Strategy
- Strategy ST (Strength-Theat)
- WT (Weakness-Threat) Strategy

The SWOT matrix determines key success factors for the external and internal environment, which is a difficult part, so good judgment is needed. Meanwhile, none of the matching tools are considered the best.

- SO (Strength-Opportunity) Strategy

  This strategy uses internal strength to seize opportunities that exist outside Demak Regency. If the Department of Agriculture and Food of Demak Regency has many weaknesses, inevitably it has to overcome its weaknesses in order to become strong. Meanwhile, if you face many threats, you must try to avoid them and try to avoid them and try to concentrate on the opportunities that exist.
- WO (Weakness-Opportunity) Strategy

  This strategy aims to minimize the internal weaknesses of the Department of Agriculture and Food of Demak Regency by taking advantage of external opportunities.
- Strategy ST (Strength-Threat)

  This strategy is expected to avoid or reduce the impact of external threats.
- WT (Weakness-Threat) Strategy

  This strategy is a defensive tactic by reducing internal weaknesses and avoiding threats.

IFE → / EFE ↓	**Strength – S**	**Weaknesses - W**
	(1). Improving the performance accountability of the Department of Agriculture and Food; (2). Increased productivity of rice and main food per hectare (3). The agricultural sector is the leading sector in Demak Regency (4). The availability of land area for paddy fields, where the area of agricultural land in Demak Regency, is the largest in Central Java	(1). The potential of the agricultural sector is not yet optimal (2). The selling price of agricultural products is still unstable, and sometimes it is detrimental to farmers. (3). The use of urea fertilizer for agriculture is still rather difficult for farmers to obtain. (4). The generation of farmers is the older generation, and many young people are not interested in becoming farmers.
Opportunity-O	**Strategy SO**	**Strategy WO**
(1). Demak Regency is included in the National Activity Program (PKN) program (2). KEDUNG SEPUR Strategic Position in Demak Regency (3). Semarang-Demak Toll Road	(1). PMDN and FDI investments in the agricultural sector (2). Improvement of structured financial distribution system and monitoring based (3). Land-saving farming (hydroponics)	(1). Agricultural machinery grants to farmer groups (2). Farmer subsidies in the form of seed subsidies, fertilizer subsidies, pesticide subsidies, innovation/technology subsidies.

(4). Jatenglands Industrial Park Sayung (JIPS)	(4). Strengthening family food (food yard, neighboring community farming). (5). Green Investment, Ecogreen Industrial Park (6). It is necessary to strengthen agricultural institutions to become business institutions/businesses that are legal entities and market the products of their members	(3). Extensification of sustainable food barns for food security by building sustainable food houses in every household, RT, RW, Kelurahan, Kecamatan (4). Farmers use organic products (5). Maximizing the function of young farmers as marketing of agricultural products
Threats-T (1). Flood Rob (2). Abrasion (3). The reduced use of paddy fields is shifting to non-paddy fields (4). Prices of agricultural products that do not break even point	**Strategy ST** (1). Farmers Market from organizing, collecting agricultural products, individual services to large scale. (2). Land-saving farming (hydroponics) (3). Strengthening family food (food yard, neighboring community farming). (4). Innovation of local agricultural processed food products (5). Provision of warehouses for farmer groups (6). Support the transportation of food products (7). Labor-intensive projects in the form of improvements to agricultural supporting infrastructure (irrigation networks, roads, warehouses). (8). Smallholder tax exemption, tax breaks for medium/large farmers. (9). Provision of food assistance to small-scale farmers and farm labourers	**Strategy WT** (1). Seed subsidies, fertilizer subsidies, pesticide subsidies, innovation/technology subsidies. (2). Cheap credit services. (3). Capital assistance for farmer groups/individuals (4). Land-saving farming (hydroponics) (5). E-Marketing

Figure 6. SWOT Matrix
Source: Exploring the Agricultural Country of Central Java 2011 s.d. 2021, Strategic Plan of the Department of Agriculture and Food Crops of Demak Regency, modified (2022)

Figure 6 shows that the strength of agriculture in Demak Regency is the driving force to increase agricultural output in Demak Regency, Strength (S) The strength of the Agriculture Sector in Demak Regency includes:

- Improving the performance accountability of the Department of Agriculture and Food;
- Increased productivity of rice and main food per hectare
- The agricultural sector is the leading sector in Demak Regency
- Availability of land area for paddy fields, where the area of agricultural land in Demak Regency, is the largest in Central Java

Opportunity (O) opportunities for the Agriculture Sector in Demak Regency include:

- Demak Regency is included in the National Activity Program (PKN) program
- Demak Regency KEDUNGSEPUR Strategic Position
- Semarang-Demak Toll Road
- Jatenglands Industrial Park Sayung (JIPS)

Table 5 shows the strengths and weaknesses and opportunities that exist in Demak Regency obtained by taking information from 4 stakeholders, namely 1 person from Bappeda, 1 person from the Demak Agriculture Service, 1 religious leader, 1 person from Demak. The IFE and EFE matrices adopt the SWOT matrix which was developed by Umar (2001).

Table 6. Strengths-Weaknesses (IFE) Opportunities in Agriculture Demak Regency

Internal Factors	**B**	**R**	**BXR**
Strength			
There is increased accountability for the performance of the Department of Agriculture and Food	0.10	3	0.30
Increased productivity of rice and main food per hectare	0.15	3	0.45
The agricultural sector is the leading sector in Demak Regency	0.15	4	0.60
The availability of land area for paddy fields, where the area of agricultural land in Demak Regency, is the largest in Central Java	0.10	4	0.40
Weakness			-
The potential of the agricultural sector is not yet optimal	0.15	4	0.60
The selling price of agricultural products is still unstable, and sometimes it is detrimental to farmers	0.10	3	0.30
The use of urea fertilizer for agriculture is still rather difficult for farmers to obtain.	0.10	2	0.20
The generation of farmers is the older generation, and many young people are not interested in becoming farmers.	0.15	3	0.45
Total	1.00		3.30

Source: Modified Demak District agricultural SWOT matrix (2022)

Table 6 and Table 7 show the IFE (3.30) and EFE (3.15) potential opportunities in the agricultural sector in Demak Regency, it is found that the IE axis is in cell 2, where the appropriate strategy is a proactive strategy, where the appropriate policy is Use your strengths to seize the opportunities that exist. And Figure 7 shows the agricultural position of Demak Regency in room II with IFE (3.30) and EFE (3.15) matrix scores.

Table 7. Opportunities and Threats (EFE) in Agriculture Demak Regency

External Factors	B	R	BXR
Opportunity			
Demak Regency is included in the National Activity Program (PKN) program	0.15	4	0.60
Demak Regency KEDUNGSEPUR Strategic Position	0.15	3	0.45
Semarang-Demak Toll Road	0.15	4	0.60
Jatenglands Industrial Park Sayung (JIPS)	0.10	4	0.40
Threat			
Rob Flood	0.10	3	0.30
Abrasion	0.10	3	0.30
Reducing the use of paddy fields to	0.10	2	0.20

External Factors	B	R	BXR
switch to non-rice fields			
Prices of agricultural products that do not break even point	0.15	2	0.30
Total	1.00		3.15

Source: Modified Demak District agricultural SWOT matrix (2022)

Demak Regency Development Plan Strategy for 2025, namely Accelerating Infrastructure Development, especially in Coastal Areas, Agriculture and Growth Centers/Production Centers in the form of an implementation plan for improving and maintaining the district's road and bridge network; integrated farming irrigation network (jitut), flood and tidal management; agricultural business road (jut); agricultural reservoirs; rehabilitation of river embankments; arrangement of sidewalks and city drainage; drinking water management system (spam); waste water (spal)/sanitation management system; improving tourist attraction facilities and infrastructure; increased financial assistance to village governments

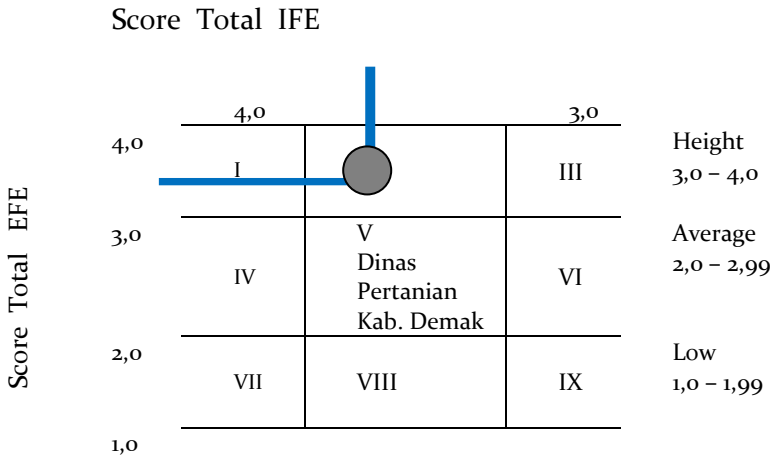

Figure 7. Matrix IFE – EFE
Source: Modified Demak District agricultural SWOT matrix (2022)

Agricultural Land Affected by Robb Flood

The agricultural land affected by the Robb flood in Sayung District, namely Gemulak Village, is 302 Ha; Tugu Village 317 Ha; Sidorejo Village has 245 Ha; Tambakkroto Village 200 Ha; Sayung Village 186 Ha; Banjarsari Village 131 Ha; Timbulsloko Village has 94 Ha. The agricultural land affected by the Robb flood in Karang Tengah District is Wonokerto Village, 165 Ha; Batu Village 135 Ha; Wonowoso Village 117 Ha; Wonoagung Village 105 Ha; Shaman Village 92 Ha. Agricultural land affected by the robb flood in Kebon Agung District, namely Purworejo Village 226 Ha, Ddesa Karangrejo 200 Ha; Tridonorejo Village 180 Ha; Kembangan Village 173 Ha; Betahwelang Village 155 Ha; Gebangarum Village 150 Ha. Agricultural land affected by robb flooding in Kebon Agung

District is Tendunan Village 18 Ha, Mutih Wetan Village 13 Ha.

The strategy for the agricultural sector in Demak district uses an intensification strategy and a diversification strategy. The agricultural strategy mechanism in Demak Regency implements a diversification strategy. Diversification strategies include planting patterns, use of agricultural tools, care for agricultural plants and harvesting. When the paddy fields are planted with agricultural crops, the village farmers first harrow the land so that the land is ready for planting with agricultural crops such as rice or crops. So that in a year it can produce three times the harvest with the first planting season of rice, the second planting season of rice and the third growing season of crops (green beans, soybeans, and corn).

Some farmers in Demak Regency use an agricultural strategy with a diversification pattern using 2 planting patterns, namely the moculture planting pattern and the intercropping pattern. Agricultural farming in Demak Regency uses a monoculture planting pattern, a planting pattern where only one type of plant is planted on one land. This pattern does not allow the presence of other types of plants on the same land. This cropping pattern is usually carried out by farmers who have narrow land. Treatment for this type of cropping pattern is considered in earnest. Arrangement of plants in monoculture on certain land and in a certain time (plant age) is only planted with one type of plant. The moculture planting pattern is used during the rainy season, namely the paddy fields are planted with rice. Meanwhile, during the dry season, paddy fields are planted with secondary crops which are adapted to soil conditions, irrigation and so on. Monoculture cropping patterns can also be called crop rotation cropping patterns.

Most farmers in Demak Regency use an intercropping pattern. Planting with an intercropping pattern means plants that have different ages. If they are almost the same age, they should have different growth phases and also have different water requirements. Farmers in Demak Regency use a farming diversification pattern with the planting pattern carried out by farmers in their rice fields within one year is as follows:

- Rice – Rice – Green Beans
- Padi – Padi – Green Beans with Corn
- Rice – Rice – Green Beans with Soybean

Demak Regency's agricultural intensification strategy involves efforts to increase agricultural productivity by optimizing existing agricultural land, namely intensifying rice and secondary crops in paddy fields. The agricultural area consists of a food crop area and a horticultural area. The Demak Regency food crop area has an area of approximately 56,763 ha spread across all sub-districts and a sustainable food area of approximately 56,530 ha which is included in the food crop area and horticultural area with

an area of approximately 1,556 ha. The fisheries area in Demak Regency consists of capture fisheries and aquaculture where pond cultivation has a total area of approximately 6,062 ha spread across the Districts of Sayung, Karangtengah, Bonang, Mijen and Wedung. Meanwhile, capture fisheries include capture fisheries facilities and development of fisheries processing. The most potential planting area for agricultural food commodities in Demak Regency in 2021 is 94,490 Ha of rice, followed by green beans and corn. Demak Regency's agricultural productivity in 2021 has cassava plants of 215.05 tons/ha, followed by cassava plants of 206.48 tons/ha; corn crop 73.22 Tons/Ha; rice plants 69.38 Tons/Ha; Sorghum plants 66.89 Tons/Ha; soybean plants 21.77 Tons/Ha; peanut plants 18.6 tons/ha, and green bean plants 10.77 tons/ha.

Agricultural Land Area

The most potential planting area for agricultural food commodities in Demak Regency in 2021 is 94,490 hectares of rice, followed by green beans and corn. Meanwhile, the agricultural productivity of Demak Regency in 2021 has cassava plants of 215.05 tons/ha, followed by cassava plants of 206.48 tons/ha; corn crop 73.22 Tons/Ha; rice plants 69.38 Tons/Ha; Sorghum plants 66.89 Tons/Ha; soybean plants 21.77 Tons/Ha; peanut plants 18.6 tons/ha, and green bean plants 10.77 tons/ha.

Table 7 identifies that initially in 2019 the use of paddy fields dominated, then shifted to non-paddy and non-farm agricultural land in 2021. The contribution of the agricultural sector has decreased allegedly because the construction of the Semarang-Demak Toll Road Construction Project continues the construction of the Semarang Toll Road Section C starting from Kaliwage (on off the existing toll road) to Demak City. Work on this project began in December 2019 and is planned to be completed in November 2022. The Semarang-Demak Package 2 Toll Road Development Project is a project undertaken by PT. PP Semarang-Demak to invest in the construction of a 16.31 km long toll road located in the District Sayung, Demak Regency, Central Java Province which was carried out by the PP-WIKA Consortium.

Table 8. Land Use Area on Demak Regency Land Use 2017-2021

Years	Land Use			Total Land Area
	Ricefield	Non-Field Agriculture	Not Agriculture	
2017	52.178	21.646	15.919	89.743
2018	52.178	21.646	15.919	89.743
2019	52.347	21.120	16.276	89.743
2020	53.597	18.938	17.208	89.743
2021	52.761	20.759	16.223	89.743

Source: Department of Agriculture and Food District. Demak (2021)

Table 9 identifies that most paddy fields in 2021 in Demak Regency will be in Wedung

District 5,429 Ha; then followed by Karanganyar District 5,309 Ha, and Bonang District 5,108 Ha. In 2021, most of the non-rice field agricultural land in Demak Regency will be in Sayung District with 3,913 Ha, followed by Wedung District with 3,716 Ha, and Maranggen District with 3,545 Ha. Most of the non-agricultural land in 2021 in Demak Regency will be in Sayung District with 2,425 Ha, followed by Mranggen District with 2,227 Ha. and Guntur District 1,761 Ha.

Table 9. Land Use Area by District Demak Regency 2021 (hectares)

Subdistrict	Land Use			Total Land Area
	Ricefield Ricefield	Non-Field Agriculture	Not Agriculture	
Mranggen*), ***)	1,450,0	3,545,0	2,227,0	7,222
Karangawen	2,640,0	2,908,0	1,147,0	6,695
Guntur***)	3,965,0	27,0	1,761,0	5,753
Sayung*) ***)	1,531,0	3,913,0	2,425,0	7,869
Karang Tengah	3,572,0	677,0	906,0	5,155
Bonang **)	5,108,0	2,290,0	926,0	8,324
Demak	4,307,0	293,0	1,513,0	6,113
Wonosalam	3,811,4	441,6	1,535,0	5,788
Dempet	4,793,0	372,0	996,0	6,161
Kebonagung	3,496,0	38,0	665,0	4,199
Gajah	3,888,0	175,0	720,0	4,783
Karanganyar**)	5,309,0	507,0	960,0	6,776
Mijen	4,298,0	35,0	696,0	5,029
Wedung *), **)	5,429,0	3,716,0	731,0	9,876
Total	53,597,4	18,937,6	17,208,0	89,743

Source: Department of Agriculture and Food District. Demak (2021)
Noted :
• Red writing shows the number of rice fields; *)
• Blue text indicates the amount of non-rice field land; **)
• Green text indicates the amount of non-agricultural land; ***)

Table 10 identifies that the highest average productivity of agricultural commodities in Demak Regency in 2021 is cassava 206.48 tons/ha, followed by sweet potato 215.05 tons/ha, corn 73.22 tons/ha, and rice 69.38 tonnes/ha. Agricultural intensification

strategy in Demak Regency by increasing the productivity of agricultural products in Demak Regency. Table 9 identifies that rice productivity in Demak District is mostly produced in Gajah District, Mijen District and Wonosalam District. The highest productivity in Demak Regency is cassava.

Table 10. Productivity of Agricultural Commodities by District in Demak Regency 2021

Subdistrict/ Commodity	Productivity (Tons/Ha)							
	Paddy	**Corn**	**Cassava**	**Sweet potatoes**	**Peanuts**	**Mung beans**	**Soya bean**	**Sorghum**
Mranggen	64.07	73.71	-	-	-	10.18	-	-
Karangngawen	67.68	73.41	-	-	-	11.02	-	-
Guntur	62.38	70.63	-	-	-	10.67	-	-
Sayung	67.57	70.14	-	-	-	-	-	-
Karangtengah	66.39	54.15	-	-	-	11.99	-	-
Bonang	64.26	-	203.630	209.91	19.2	10.33	-	-
Demak	69.81	70.89	207.730		18.7	10.46	21.69	67.61
Wonosalam	73.89	-	207.390	-	-	10.94	-	-
Dempet	71.90	73.24	205.330	-	19.5	11.16	-	-
Kebonangung	72.28	72.35	207.230	-	18.1	10.97	-	-
Gajah	76.67	69.46	-	211.14	18.2	10.62	1.00	-
Karanganyar	68.20	67.37	-	217.56	19.3	10.63	21.11	-
Mijen	74.78	68.76	204.960	210.01	18.3	10.60	-	60.94
Wedung	67.24	69.18	4.000	-	17.7	10.22	-	-
Average Productivity	69.38	73.22	206.48	215.05	18.6	10.77	21.77	66.89

Source: Department of Agriculture and Food District. Demak (2021)

Spatial Connectivity of Demak Regency with the Hinterland

The spatial structure plan for the Demak Regency development area consists of an urban system plan and an infrastructure network system plan. The urban system plan consists of urban structure and regional systems. Regional development potential is focused on urban structure which can be detailed as follows:

1. PKN (National Activity Center) is part of the Kendal – Demak – Ungaran – Salatiga – Semarang – Purwodadi (Kedungsepur) urban area in Sayung District, Karangtengah District, Demak District and Mranggen District.
2. PKL (Local Activity Center) covers the Demak urban area and the Mranggen urban area. The Sayung urban area and the Wedung urban area are encouraged to act as street vendors.
3. PPK (Regional Service Center) covers the urban areas of Gajah, Dempet, Guntur, Sayung, Karangtengah, Bonang, Wedung,

Karangawen, Wonosalam, Karanganyar, Mijen, and Kebonagung.

4. PPL (Environmental Service Center) includes: Tambirejo Village is in Gajah District; Dempet Village and Sidomulyo Village are in Dempet District; Pamongan Village is in Guntur District; Gemulak Village and Bulusari Village are in Sayung District; Pulosari Village and Karangsari Village are in Karangtengah District;Gebang Village and Bonangrejo Village are in Bonang District;Tlogorejo Village is in Karangawen District; Kendaldoyong Village and Trengguli Village are in Wonosalam District; Cangkring Village is in Karanganyar District; Bakung Village is in Mijen District; Werdoyo Village is in Kebonagung District ; Buko Village and Bungo Village are in Wedung District.

Figure 8 shows the connectivity of Demak Regency using the Euclidean Distance spatial weight matrix. Demak Regency is connected with the hinterland area of Semarang City and Kudus Regency. This is presumably because geographically, Demak Regency is bordered by Semarang City and Kudus Regency.

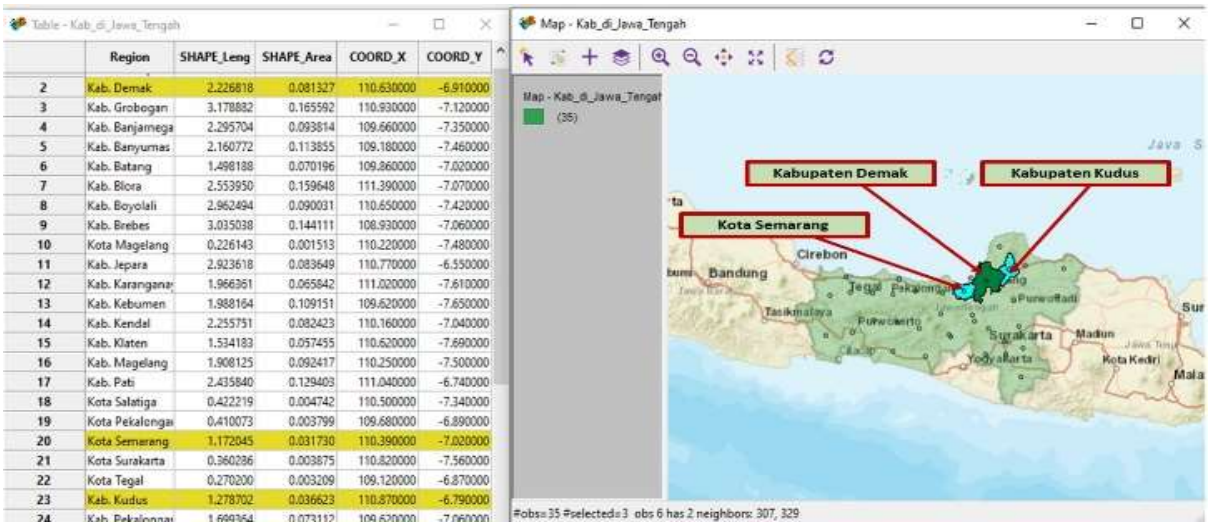

Figure 8. Spatial connectivity of Demak Regency
Source: Central Java map processed by GeoDa subversion version 1.20.0.36 which was released 12 February 2023.

Table 10 identifies the existence of connectivity between sub-districts in Demak Regency using the Euclidean Distance approach. Demak Regency has 14 sub-districts which are geographically close to each other. Demak Regency has confirmed that the most rice fields are in Wedung District, Bonang District and Demak District.

Table 10. Connectivity between Demak Regency using Euclidean Distance approach

Districts	Inter-District Connectivity
Wedung*)	Bonang
Bonang*)	Wedung, Karangtengah, Demak
Demak*)	wonosalam, Mijen, Bonang
Wonosalam	Gajah, Dempet, Demak
Dempet	Wonosalam, Kebonagung, Gajah
Karangawen	Mranggen
Sayung	Karangtengah
Mranggen	Karangawen
Kebonagung	Dempet
Gajah	Wonosalam, Karanganyar, Dempet
Karanganyar	Mijen, Gajah
Mijen	Karanganyar, Demak
Guntur	Karangtengah
Karangtengah	Sayung, Guntur, Bonang

Source : processed (2023)

Figure 9 shows the connectivity of Karanganyar District with the hinterland area of Mijen District and Gajah District.

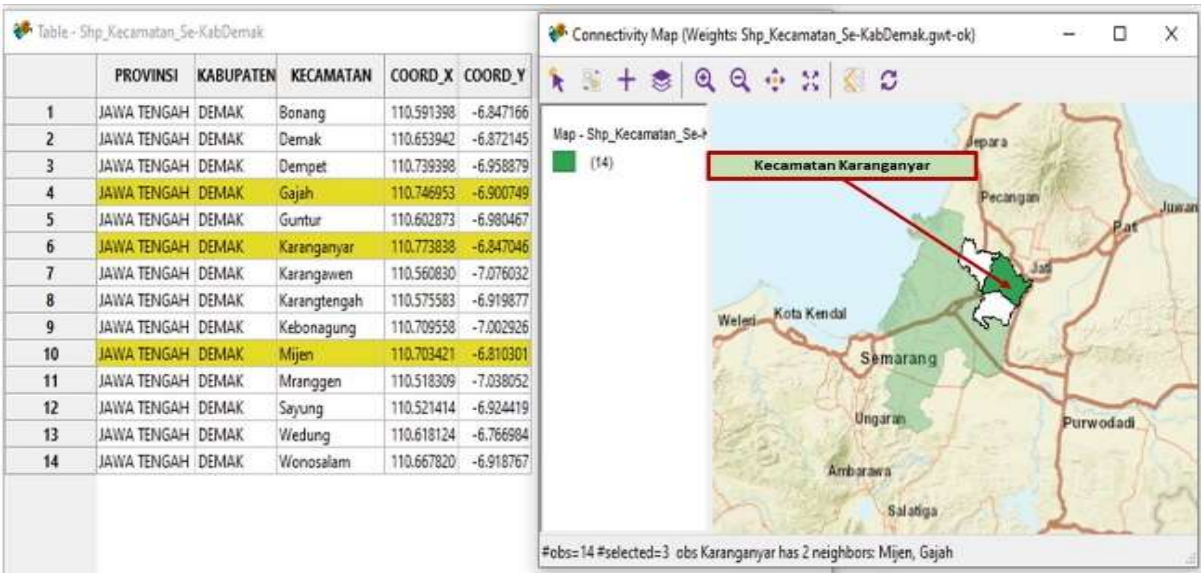

Figure 9. Spatial connectivity of Karanganyar District, Demak Regency
Source : processed (2023)

Figure 10 shows the connectivity between Bonang District and the hinterland areas of Wedung District, Karangtengah District, and Demak District.

	PROVINSI	KABUPATEN	KECAMATAN	COORD_X	COORD_Y
1	JAWA TENGAH	DEMAK	Bonang	110.591398	-6.847166
2	JAWA TENGAH	DEMAK	Demak	110.653942	-6.872145
3	JAWA TENGAH	DEMAK	Dempet	110.739398	-6.958879
4	JAWA TENGAH	DEMAK	Gajah	110.746953	-6.900749
5	JAWA TENGAH	DEMAK	Guntur	110.602873	-6.980467
6	JAWA TENGAH	DEMAK	Karanganyar	110.773838	-6.847046
7	JAWA TENGAH	DEMAK	Karangawen	110.560830	-7.076032
8	JAWA TENGAH	DEMAK	Karangtengah	110.575583	-6.919877
9	JAWA TENGAH	DEMAK	Kebonagung	110.709558	-7.002926
10	JAWA TENGAH	DEMAK	Mijen	110.703421	-6.810301
11	JAWA TENGAH	DEMAK	Mranggen	110.518309	-7.038052
12	JAWA TENGAH	DEMAK	Sayung	110.521414	-6.924419
13	JAWA TENGAH	DEMAK	Wedung	110.618124	-6.766984
14	JAWA TENGAH	DEMAK	Wonosalam	110.667820	-6.918767

Figure 10. Spatial connectivity of Bonang District, Demak Regency
Source : processed (2023)

Demak Regency Strategy

The Demak Regency Regional Spatial Plan for 2011 – 2031 contains objectives, policies, regional spatial planning strategies, spatial structure plans, spatial pattern plans, strategic area determination, spatial utilization directions and spatial utilization control directions. Demak Regency's spatial planning policy includes:

1. controlling the conversion of productive agricultural land;
2. development of prospective agricultural commodities;
3. development of coastal areas;
4. development of service centers;
5. development of regional infrastructure in urban and rural areas;
6. improving protected area management;
7. controlling the development of cultivation activities so that they do not exceed the carrying capacity and capacity of the environment;
8. development of industrial areas that consider space effectiveness; And
9. increasing the function of defense and security areas.

Mentioned more specifically, Demak Regency currently has 701 ha of mangrove ecosystem area stretching along the coast of Bonang District, Karangtengah District, Sayung District and Wedung District. The mangrove ecosystem needs to be maintained and even developed because it plays a major role in preventing coastal erosion and abrasion, one of the environmental threats that Demak Regency has faced for many years. Apart from that, the mangrove ecosystem functions as a filter for pollutants, provides a habitat for other species and has the potential to become a regional tourist area.

Demak Regency's cultivation areas are divided into production forest areas, agricultural areas, fisheries areas, mining and energy areas, industrial areas, tourism areas, residential areas and defense and security areas. The production forest area in Demak Regency is in Karangawen and Mranggen Districts with an area of approximately 3,278 ha, consisting of a limited production forest area of 568 hectares in Karangawen District and a permanent production forest area of 2,710 hectares in Karangawen and Mranggen Districts. The agricultural area consists of a food crop area and a horticultural area. The Demak Regency food crop area has an area of approximately 56,763 ha spread across all sub-districts and a sustainable food area of approximately 56,530 ha which is included in the food crop area and horticultural area with an area of approximately 1,556 ha. The fisheries area in Demak Regency consists of capture fisheries and aquaculture where pond cultivation has a total area of approximately 6,062 ha spread across Sayung, Karangtengah, Bonang, Mijen and Wedung subdistricts. Meanwhile, capture fisheries include capture fisheries facilities and fisheries processing development. Mining and energy areas in Demak Regency in the form of an oil and gas mining area which is included in the Blora Block Working Area.

CONCLUSIONS AND SUGGESTIONS

Conclusions

The conclusion from the results of this study is that the agricultural sector is the leading sector in Demak Regency which will increase the economic growth of Demak Regency. The agricultural strategy used is an extensification strategy with intercropping cropping patterns in the form of cropping patterns carried out by farmers in their paddy fields within one year as follows: Paddy – Paddy – Green Beans; Padi – Paddy – Green Beans with Corn; Padi – Padi – Mung Beans with Soybeans. The agricultural strategy of Demak Regency uses an intensification strategy, namely increasing the level of productivity of agricultural products with the available land area. The productivity of agricultural products in Demak Regency includes cassava, sweet potato, rice, corn, peanuts, green beans, soybeans and sorghum. Based on the results of mapping with Geoda, it was identified that Demak Regency was connected to the hinterland area of Semarang City and Kudus Regency. This is presumably because geographically, Demak Regency is bordered by Semarang City and Kudus Regency. Demak Regency has 14 sub-districts which are geographically adjacent to each other. The most confirmed rice fields in Demak Regency are in Wedung District, Bonang District, and Demak District.

Suggestions

One of the policy recommendation for Demak Regency are Demak Regency Development Plan Strategy for 2025, namely Accelerating Infrastructure Development, especially in Coastal Areas, Agriculture and Growth Centers/Production Centers in the form of an implementation plan for improving and maintaining the district's road and bridge network; integrated farming irrigation network (jitut), flood and tidal management; agricultural business road (jut); agricultural reservoirs; rehabilitation of river embankments; arrangement of sidewalks and city drainage; drinking water management system (spam); waste water (spal)/sanitation management system; improving tourist attraction facilities and infrastructure; increased financial assistance to village governments

Implications and Limitations

The limitation of this research is to examine agriculture in general. It is hoped that further research can specifically examine the results of agricultural production in Demak Regency.

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