

STRATEGY FOR REALIZING A GREEN ECONOMY IN DEVELOPING THE AGRICULTURAL SECTOR IN THE HIGHEST RICE AGRICULTURE LAND IN THE BANYUMAS REGENCY

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ABSTRACT

Green economy is an economic development model that supports sustainable development. The goals of sustainable development require the implementation of green economy, such as the effective and efficient utilization of natural resources in the long term. The objective of this research is to analyze the strategies for implementing green economy in paddy farming in Sumbang Sub-District. Purposive sampling technique was used to select respondents who have responsibilities and influence on paddy farming in Sumbang Sub-District. The researchers utilized a questionnaire as an analytical tool to gather and analyze data in the study.

Sumbang Sub-District is an area with the largest paddy agricultural land in Banyumas Regency, and therefore has the potential for farmers to adopt behaviors and activities that support green economy. The title of this research is: "Strategies to Achieve Green Economy in Developing the Agricultural Sector in the Sub-District with the Highest Paddy Agricultural Land in Banyumas Regency."

The aim of this research is to analyze the strategies for implementing green economy in paddy farming in Sumbang Sub-District. SWOT analysis is a strategic analysis method used to evaluate the internal and external factors that influence the performance of an organization or project. The research findings and data analysis indicate that: (1) The most suitable strategy for implementing green economy in paddy farming in Sumbang Sub-District is the S-T strategy (strengths-threats), also known as the diversification strategy, which means that paddy farming in Sumbang Sub-District should leverage internal strengths to minimize external threats.

The implications of this research are the need for support and facilitation from policymakers, including easy access to organic fertilizers, training, incentives, educational programs, the development of environmentally friendly alternatives, strict monitoring of chemical usage, and policies and incentives that support organic farming products. These measures are necessary to promote the implementation of green economy in paddy farming in Sumbang Sub-District.

Keywords: *Strategy, Green Economy, Rice Farming, SWOT*

1. Introduction

1.1 Background

Indonesia is known for its abundant natural resources. These resources include land and the biodiversity that is found and spread from Sabang to Merauke. One of the natural resources

that Indonesia can optimize is the agricultural sector. Agriculture is a key sector in Indonesia for creating employment opportunities, surpassing other sectors in the Indonesian economy (Widyawati, 2017). One of the largest agricultural products in Indonesia is rice farming. According to data from the Central Statistics Agency (BPS) in 2021, the largest rice producers in Indonesia are located in provinces on the island of Java, with East Java being the top producer, followed by Central Java and West Java.

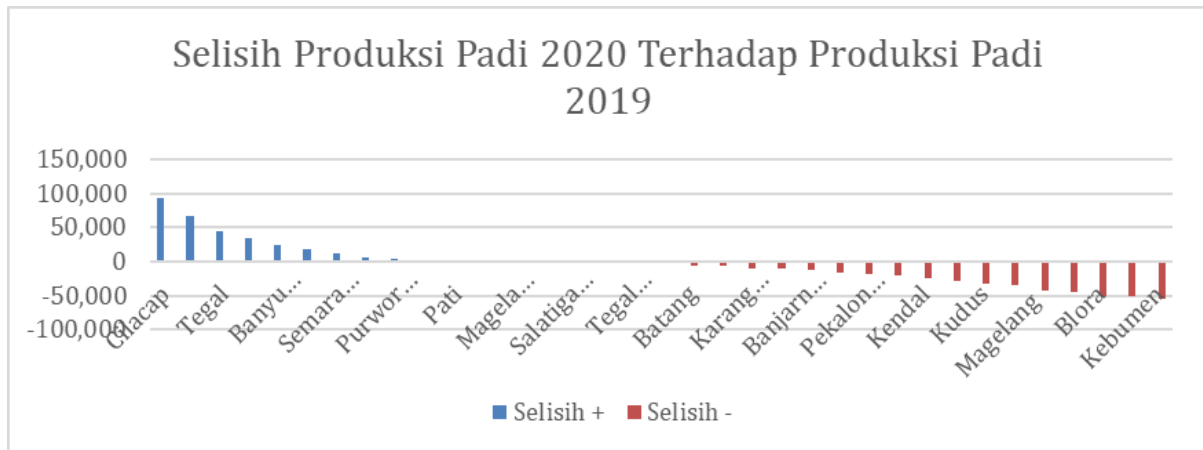


Source: BPS Data on Rice and Rice Production 2021

Figure 1.1 Top 10 Largest Rice Producers in Indonesia

West Java was able to produce 9.90 million tons of milled rice (GKG). Central Java followed with a rice production of 9.76 million tons of GKG. The third highest rice-producing province is Jawa Barat with a production of 9.35 million tons of GKG. The International Rice Research Institute (IRRI) recognized Indonesia for achieving rice self-sufficiency, as evidenced by the consistent national rice production of 21.3 million tons in 2019. Based on BPS calculations, the highest end-of-stock quantity in April 2022 was recorded at 10.2 million tons.

Looking at the data, Central Java is the province with significant rice production after West Java. This is because Central Java has suitable agricultural and plantation areas. Additionally, Central Java receives sufficient rainfall as it is located at 5°40' - 8°30' S and 108°30'-111°30' E. This geographical position provides Central Java with fertile land on various mountain slopes. Central Java has a total area of 32,800.69 km², which accounts for approximately 28.94% of the total area of Java Island (BPS, 2023). However, the total rice production in Central Java in 2020 experienced a decrease of 1.72% compared to 2019. Despite the overall decrease in 2020, 12 out of 29 regencies in Jawa Tengah actually showed an increase in rice production from the previous year. This can be seen in Figure 1.2.



Source: Harvested Area and Rice Production in Central Java Province 2020

Figure 1.2 Difference in Rice Production in 2020 Compared to Rice Production in 2019

Based on Figure 1.2, in 2020, there were 12 regencies that experienced an increase in rice production: Cilacap, Brebes, Tegal, Grobogan, Banyumas, Purbalingga, Semarang, Wonogiri, Purworejo, Wonosobo, Pati, and Semarang City. Banyumas Regency, being one of the regencies with the fifth largest increase in rice harvest compared to the previous year in Central Java, recorded a growth of 3.25%. According to BPS data in 2020, the agricultural land area in Banyumas Regency was approximately 88,212 hectares, with rice production of 477,013 tons, accounting for around 4.2% of rice production in Central Java. Banyumas has many areas dedicated to rice farming across various districts (SIMDA Green Economy Banyumas, 2018). In Banyumas Regency, there are 26 sub-districts engaged in rice farming. Among them, Sumbang District has the highest harvested area of rice, as shown in Table 1.1.

Table 1.1 Harvested Area of Paddy Fields in Banyumas Regency, 2013-2018.

KECAMATAN	_2013	_2014	_2015	_2016	_2017	_2018
Cilongok	3881	4201	4912	1662,9	4725,4	4957
Gumelar	2721	1993	2116	2639,2	2155,8	2177
Lumbir	2034	2047	2090	2240,3	2027	2089,4
Pekuncen	4709	4519	4728	4468,5	4130,5	4237
Ajibarang	3638	3485	3420	3614,2	3784,2	2893
Jatilawang	3133	3116	3221	3225,9	3133,8	3298
Wangon	2939	2934	3036	3205,6	2990,9	3080
Purwojati	2159	1922	2002	2471,6	1920,4	2220
Rawalo	2668	2668	2775	2737,3	2653,6	2770
Kemranjen	3604	3310	3776	3621,3	3318,5	3764
Tambak	3279	3040	3402	3270,4	3040,6	3437
Somagede	1055	1026	1063	882	963,1	1106
Sumpiuh	3080	2809	3133	3016,8	2475,3	3242
Kebasen	1861	1964	1836	1914,6	1829,6	1989
Banyumas	1097	1102	1099	1217,1	954,5	1164
Sumbang	3743	3038	4286	4481,9	4944	4972
Karanglewas	1744	1385	2078	2494,5	2729,3	2970
Kedungbanteng	2564	1841	2708	3097,2	3116,3	3771
Baturraden	2143	2040	2408	2355,3	2465,9	2317
Kalibagor	1799	1694	1708	1989,8	2013,4	1999
Patikraja	2941	2701	2908	3027	2941,1	3074
Sokaraja	3118	3099	3250	3183,7	3084,9	3214
Kembaran	3200	3932	3323	3764,2	3230,4	3455
Purwokerto Timur	278	262	274	240,7	237,8	218,4
Purwokerto Selatan	438	439	442	442,8	388,2	438
Purwokerto Utara	596	593	681	680,3	533,7	682

Source: Simda Green Economy Banyumas Regency

Despite being the sub-district with the highest rice farming land in Banyumas, there are still challenges in implementing green economy practices. Green economy is a model of economic development that supports sustainable development to achieve social well-being and environmental preservation (DJPb, 2023). During a survey conducted in the largest rice farming sub-district in Banyumas, it was found that the farmers were aware of one of the strategies towards green economy promoted by the agricultural authorities, which is the GENTA Organik (Organic Farming Movement). GENTA Organik is a pro-organic farming movement that involves the use of organic fertilizers, biofertilizers, and soil amendments as solutions to the expensive fertilizer issue, encouraging farmers to produce their own organic fertilizers, biofertilizers, and soil amendments (Nursyamsi, 2022). GENTA Organik was initiated due to the decline in government subsidies for chemical fertilizers influenced by foreign politics, resulting in scarcity and high prices of chemical fertilizers in Indonesia.

One of the challenges in the sub-district with the largest rice farming land in Banyumas is that many farmers have not transitioned to organic farming, mainly because the majority of them

lease the land. This situation puts pressure on farmers to maximize short-term profits in order to pay the land lease. It also affects their income as the profits are reduced by the cost of leasing the land. The ownership of rice farming land in Banyumas is not well-documented, as most of the land has been inherited from previous generations, which limits the farmers' ability to improve the land or its condition (Hutabarat, 2013).

The implementation of green economy practices can be carried out within the agricultural sector (Susanti & Wicaksono, 2019). Green economy should begin with behaviors and activities that support sustainable development. The development of the agricultural sector can contribute to the realization of green economy practices. If the agricultural sector, especially rice farming, can achieve green economy development, then the overall development can be sustainable. However, the reality is that not all communities understand and behave in a way that supports green economy practices.

Based on these issues, the author is interested in researching strategies for implementing green economy in the agricultural sector in the sub-district with the largest potential for rice farming in Banyumas Regency.

1.2 Problem Statement

Green economy is a model of economic development that supports sustainable development. The goal of sustainable development requires the implementation of green economy practices, such as utilizing natural resources effectively and efficiently in the long term.

Sumbang District is an area with the largest rice farming land in Banyumas Regency, indicating its potential for farmers to adopt behaviors and activities that support green economy practices. However, based on preliminary research, it is evident that some farmers still lack understanding and willingness to implement behaviors that support green economy due to various conditions.

Therefore, based on the problem statement, the research question arises: What strategies can be employed to achieve green economy in developing the agricultural sector in the sub-district with the highest rice farming land in Banyumas Regency?

1.3 Research Objective

The research objective is to identify strategies for rice farming in Sumbang District in implementing green economy practices.

1.4 Research Scope

The scope of this research is within the field of Economics and Development Studies, focusing on agricultural economics with a specific emphasis on the implementation of green economy in agriculture. The research specifically focuses on identifying appropriate strategies for implementing green economy in rice farming in Sumbang District.

1.5 Research Benefits

The benefits obtained from this research are as follows:

- a) Theoretical Benefits

- Adding to the research literature on the implementation of green economy in the agricultural sector.
 - Serving as a reference and source of information for further research on green economy in the agricultural sector.
- b) Practical Benefits:
- The research findings can provide input for the Ministry of Agriculture and the Agricultural Extension Agency in Sumbang.

2. Literature Review

2.1 Rice Farming

Rice is one of the main crops in the agricultural sector (Francisco et al., 2017). It is an important cultivated wetland ecosystem that is associated with sustainable agricultural and environmental development (Zhuang, 2020). Rice farming produces rice, which is cooked and consumed as a staple food, particularly in Indonesia, where the majority of the population consumes rice (Nugroho et al., 2022). Additionally, rice is the most important crop for millions of small-scale farmers in various regions of Indonesia (Mergono Adi Ningrat et al., 2021). With the increasing population, the demand for rice will continue to rise. According to the Central Statistics Agency (BPS, 2018), the Indonesian population is projected to reach 294.1 million in 2030 and 318.9 million in 2045. The population growth will result in an increased need for food.

Rice farming involves various stages, starting from selecting suitable seed varieties for local environmental conditions, land preparation, ensuring sufficient water supply for irrigation, providing fertilizers, pest and disease control, to harvesting and post-harvest processing.

2.2 Green Economy

The concept of green economy is relatively new, but it is essentially a development from the concept of sustainable development (Makmun, 2020). Green economy encompasses various sectors, including agriculture. It involves efforts to reduce the negative impact of human production and consumption on the environment.

According to UNEP (2011), green economy refers to an economic system that enhances human well-being and social equity while significantly reducing environmental risks and resource scarcity. According to UNCTAD (2010), green economy is an economy that results in improved human well-being and reduced inequality, without exposing future generations to significant environmental risks and ecological scarcities. It aims to provide long-term social benefits through short-term activities that aim to reduce environmental risks.

More specifically, green economy is characterized by low carbon emissions, efficient resource use, and social inclusivity. In addition, income and employment growth in the green economy are driven by investments from both the public and private sectors, which reduce carbon emissions and pollution, improve energy and resource efficiency, and prevent biodiversity loss and ecosystem services decline.

2.3 Strategies to Achieve Green Economy

Strategies are systematic action plans designed to achieve long-term goals or specific predetermined objectives. Strategies involve the selection and allocation of resources wisely to

achieve desired outcomes. One way to measure and evaluate the impact of economic growth on future society is by internalizing the concept of green growth (Anwar, 2022).

Strategies to achieve green economy are planned action plans aimed at creating a sustainable and environmentally-friendly economic and social system. The goal is to create an economy that is oriented towards the use of renewable resources, reducing carbon emissions and waste, and improving the quality of the environment while considering human well-being and social equity. These strategies involve changes in production, consumption, and resource utilization to create a more efficient and sustainable economy in the long run. In this regard, technological innovation, government regulations, investments, and active community participation play crucial roles in creating sustainable social changes and policies.

3. Research Methodology

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3.1 Research Design

3.1.1 Type of Research

This research utilizes a quantitative method to identify strategies for achieving green economy in developing the agricultural sector in Sumbang District. The quantitative method is a process of discovering knowledge using numerical data as a tool to analyze information about the research topic (Djollong, 2014). The purpose of quantitative research is to systematically collect, analyze, and interpret quantitative data with the aim of identifying patterns or relationships that can be applied to a broader population.

3.1.2 Research Location

The research location is in Sumbang District, Banyumas Regency, Central Java.

3.1.3 Research Timeframe

This research was conducted in May 2023.

3.1.4 Population and Sample

The sampling technique used in this research is purposive sampling. Purposive sampling is a non-random sampling method in which the researcher ensures the selection of specific individuals who are suitable for the research objectives and can provide insights into the research topic (Lenaini et al., 2021). In this study, purposive sampling is conducted with the criteria that the respondents are individuals responsible for rice farming in Sumbang District and have influence over rice farming in the area.

3.1.5 Data Sources

The data sources used in this research include primary data sources obtained through questionnaires, in-depth interviews, and direct observations conducted by the researcher in Sumbang District

3.1.6 Data Collection Techniques

In this research, the researcher utilized the following data collection techniques:

a) Depth Interview

Depth interviews are qualitative research methods aimed at gaining in-depth and detailed understanding of an individual's views, experiences, and attitudes towards a specific topic. Depth interviews are typically semi-structured or unstructured, where the interviewer has open-ended topics and questions to focus on discussion rather than a predetermined set of closed-ended questions (Allmark et al., 2009). Depth interviews are commonly used to explore information that is difficult to obtain through other methods, such as individual perceptions of sensitive or controversial topics. In this method, the researcher employed open-ended questions to individuals responsible for rice farming in Sumbang District and who have influence over rice farming in the area, allowing the respondents to freely express their views and experiences, enabling the researcher to gain deeper insights into their perspectives on the research topic.

b) Questionnaire

A questionnaire is a tool used to collect data from respondents with the aim of obtaining relevant information related to the research being conducted. A questionnaire consists of a series of questions designed to gather data and responses from respondents regarding the research topic or issues. Data collected through questionnaires can be analyzed, depicted, or used to test conditions related to the research. Questionnaires have multiple uses, including in screening processes, audits, administration, public relations, and their familiar role in research (Stone, 1993). The researcher administered questionnaires to individuals responsible for rice farming in Sumbang District and who have influence over rice farming in the area to be implemented in the SWOT analysis.

c) Observation

Observation is a data collection method in research that involves directly observing phenomena or events. Observation is an intentional process of carefully watching and examining participants' behaviors in a natural environment (Cowie, 2009). In observation, the researcher notes the behaviors, incidents, or interactions that occur in the subjects or the environment being studied. Observation can be conducted using tools such as checklists, journals, or cameras and can be done in a participatory or non-participatory manner, depending on the researcher's role in the observed situation. Observation is typically used in qualitative research to obtain in-depth and comprehensive data about the observed phenomena. The researcher conducted observations to gather accurate and objective data about the observed phenomena.

3.2 Conceptual and Operational Definitions of Variables

3.2.1 Conceptual Definition

a) Green Economy

Green economy is a concept that combines environmental and economic aspects in an effort to create sustainable economic growth, taking into account environmental impacts and promoting the efficient and environmentally friendly use of natural resources. The concept of green economy is relatively new but is essentially a development of sustainable development (Makmun, 2020). Green economic development aims to create sustainable economic growth while considering environmental and social aspects.

3.2.1 Operational Definition

- a) Green economy refers to specific methods and strategies implemented to promote environmentally friendly and sustainable economic growth. The operational definition of green economy includes the use of environmentally friendly agricultural products, efficient use of existing resources, knowledge about organic practices, and government services related to green economy in agriculture. By implementing the operational definition of green economy, it is expected to achieve sustainable economic growth, reduce negative environmental impacts, and enhance social well-being.

3.3 Data Analysis Techniques

3.3.1 SWOT Analysis

In this study, SWOT analysis is used to identify suitable strategies for implementing green economy in the agricultural sector in Kecamatan Sumbang. SWOT analysis is a strategic analysis method used to evaluate the internal factors (strengths and weaknesses) and external factors (opportunities and threats) that influence the performance of an organization or project. SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats, and it can be analyzed as a process where the management team identifies the internal and external factors that affect the performance of a company or business. Strengths in SWOT analysis refer to the internal capabilities and positive factors of the business that are relevant to achieving their goals and serving customers efficiently (Namugenyi et al., 2019). In SWOT analysis, the internal strengths and weaknesses of an organization or project are evaluated to determine their ability to take advantage of opportunities and overcome threats in the external environment. SWOT analysis is typically used as a starting point in the strategic planning process to identify areas for improvement or anticipation in order to achieve set goals. Based on the results of the SWOT analysis, four strategies can be derived, namely:

- a) S-O (Strengths-Opportunities)
This strategy involves leveraging internal strengths to take advantage of external opportunities.
- b) W-O (Weaknesses-Opportunities)
This strategy involves identifying internal weaknesses that need to be addressed in order to take advantage of external opportunities.
- c) S-T (Strengths-Threats)
This strategy involves evaluating internal strengths that can help overcome external threats.
- d) W-T (Weaknesses-Threats)
This strategy involves evaluating internal weaknesses that can increase the risk from external threats.

These four alternative strategies can be depicted in a SWOT matrix as shown in Table 3.1.

Table 3.1 SWOT Matrix

	<i>Strength</i>	<i>Weakness</i>
<i>Opportunity</i>	Strategy S-O Utilizing strengths to exploit opportunities	Strategy W-O Creating strategies that minimize weaknesses to exploit opportunities
<i>Threats</i>	Strategy S-T Creating strategies that use strengths to address threats	Strategy W-T Creating strategies that minimize weaknesses and avoid threats

Source: SWOT Balanced Scorecard, Freddy Rangkuti 2014

To obtain the appropriate strategy for implementing green economy in paddy farming in Sumbang District, according to Freddy Rangkuti (2014), SWOT analysis needs to consider two factors: uncontrollable external factors and fully controllable internal factors. Internal factors represent strengths and weaknesses, while external factors represent opportunities and threats. To analyze the strengths and weaknesses internally, IFAS (Internal Factors Analysis Summary) is used to identify internal strategic factors, and to analyze the opportunities and threats externally, EFAS (External Factors Analysis Summary) is used to identify external strategic factors. By considering the scores from IFAS and EFAS, suitable strategies for paddy farming in Sumbang District can be identified.

4. Results

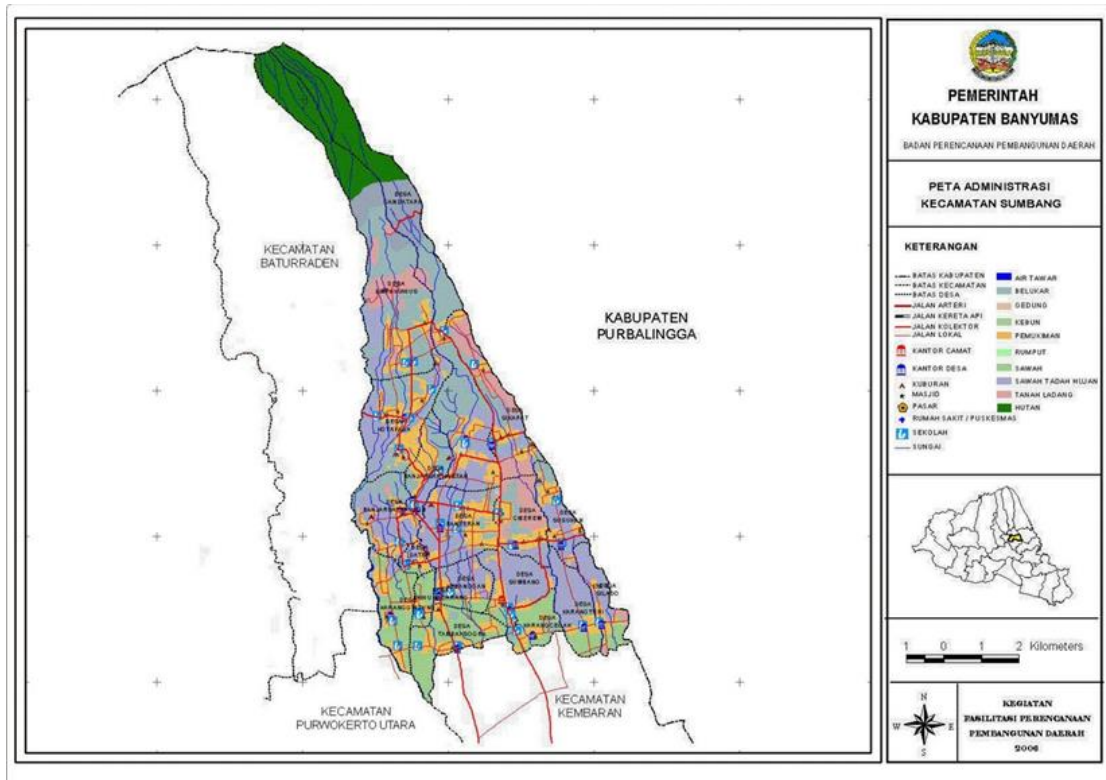
4.1 Description of Research Data

4.1.1 General Overview

This research was conducted among rice farmers in Sumbang District. Sumbang District is one of the districts located in Banyumas Regency, Central Java Province. In the agricultural sector, Sumbang District has significant potential for agricultural development, particularly in rice production. The agricultural land in this district has the highest rice cultivation area in Banyumas Regency. Strategies to achieve a green economy in the agricultural sector in this district can involve the use of organic farming techniques, efficient water management, renewable energy utilization, and other sustainable farming practices.

a) Administrative Area

Sumbang District is one of the districts located in Banyumas Regency, Central Java Province, with an area of 1,391.15 km² and divided into 19 villages. The district is located in the northern part of Banyumas Regency and shares a border with Purbalingga Regency. Geographically, Sumbang District has diverse topography, consisting of lowlands and hills. The majority of the district's land is fertile agricultural land suitable for rice farming. Several rivers flow through this district, such as the Serayu River and Luk Ulo River. Most of the land in Sumbang District is used for rice agriculture.



Source: Banyumas Regency Government

Figure 4.1 Map of Sumbang District

The boundaries of Sumbang District are as follows:

- West: Baturaden District
- North: Purbalingga Regency
- South: Kembaran District
- East: Purbalingga Regency

This research was conducted from June 5th to 11th, 2023, through interviews and questionnaires with the Head of Agricultural Extension Agency of Sumbang District, Head of Farmers' Association, as well as landowners and agricultural investors in rice farming in Sumbang District, purposively selected based on their responsibilities and influence in rice agriculture.

The data and information for this research were obtained from primary sources. Primary sources were obtained through the completion of closed and open-ended questionnaires by the respondents. The description of the respondents obtained through purposive sampling is as follows:

Table 4.1 Respondents

Responden	amount	Percentage
Head of Agricultural Extension Agency	1	40
Head of Farmers' Association	2	30
Rice Landowners and Investors in Sumbang District	5	30

	Total	8	100
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Source: Primary Data Survey 2023

Based on Table 4.1, it is known that there were 8 respondents, consisting of 1 Head of Agricultural Extension Agency, 2 Heads of Farmers' Association, and 5 Rice Landowners and Investors in Sumbang District. The Head of Agricultural Extension Agency is the respondent who is most knowledgeable about the rice agriculture conditions in Sumbang District, and 7 out of 8 respondent information were obtained from the Head of Agricultural Extension Agency, which aligns with the researcher's criteria.

4.1.2 Description of Respondents' Answers

a) Open-ended Questionnaire

The open-ended questionnaire in this research was used to gather additional information to obtain more detailed results. The open-ended questionnaire in this research covered the respondents' perceptions, allowing them the freedom to provide answers and feedback. The researcher used 4 open-ended statement items.

Table 4.2 Open-ended Questionnaire

	Statement
	Respondents' contribution to the implementation of green economy in rice agriculture in Sumbang District.
	Constraints faced by respondents in implementing green economy in rice agriculture in Sumbang District.
	Respondents' opinions on using organic agricultural products.
	Respondents' opinions and recommendations to realize the implementation of green economy.

The answers and feedback from the respondents in the open-ended questionnaire above will be used as supporting information in the discussion.

b) Closed-ended Questionnaire

The closed-ended questionnaire was used to gather additional information regarding the implementation of green economy in rice agriculture in Sumbang District. The statements in the closed-ended questionnaire used a Likert scale. The scale used includes strongly disagree, disagree, neutral, agree, and strongly agree. The scores for each positive and negative statement start from 5, indicating strongly agree.

4.2 Data Analysis

4.2.1 SWOT Analysis

a) Internal Factors Strategy Matrix

The internal factors strategy matrix consists of strengths and weaknesses. In this research, the internal factors strategy matrix is used to analyze the strengths and weaknesses of rice agriculture in Sumbang District. The internal factors strategy matrix is depicted as follows:

Table 4.3 Internal Factors Strategy Matrix

	Internal Factors	Weight	Ranking	Score
	Strengths			
1.	Already implementing green economy practices in your district by using organic fertilizers	0,108108	4	0,432432
2.	Already implementing green economy practices by using water adequately and avoiding excessive use.	0,081081	4	0,324324
3.	The agricultural land already has fertile soil that supports good rice crop growth.	0,081081	3	0,243243
4.	Fertilizer application for rice crops already utilizes organic or balanced fertilizers.	0,081081	3	0,243243
5.	Already have knowledge and skills in organic farming systems.	0,054054	2	0,108108
6.	Already aware of government policies on green economy in agriculture.	0,054054	3	0,162162
7.	Already conducted awareness campaigns on green economy for agriculture.	0,054054	3	0,162162
8.	Already have knowledge and skills in organic waste management.	0,054054	3	0,162162

9.	Avoid direct disposal of waste into water bodies.	0,081081	2	0,162162
10.	Understand the concept of sustainable agriculture or green economy.	0,054054	2	0,108108
11.	Confident that the current conditions allow the implementation of green economy in the area.	0,054054	3	0,162162
12.	Pest control is already done using environmentally friendly tools or substances.	0,081081	3	0,243243
13.	Already started reducing the use of chemical-based products.	0,081081	3	0,243243
14.	Have the intention and willingness to no longer use chemical-based products.	0,081081	4	2,756757
	Total Strength Score	1		5,513514
1.	Soil quality is a hindrance to improving agricultural quality.	0,1	4	0,4
2.	Farmers' awareness of the importance of organic agricultural products is still low.	0,1	4	0,4
3.	Lack of knowledge and understanding of government policies and regulations related to green economy in agriculture.	0,066667	4	0,266667
4.	Lack of knowledge and skills in organic waste management.	0,1	4	0,4

5.	Financial constraints faced by farmers in implementing sustainable farming practices are significant.	0,1	4	0,4
6.	Low level of knowledge and skills in organic farming systems.	0,066667	4	0,266667
7.	Direct disposal of agricultural waste into water bodies.	0,1	3	0,3
8.	Lack of understanding of the concept of sustainable agriculture or green economy.	0,066667	3	0,2
9.	Chemical-based agricultural products are still used.	0,1	4	0,4
10.	Pest control is still done using tools or substances containing chemicals.	0,1	4	0,4
11.	Still dependent on chemical-based agricultural products..	0,1	4	0,4
	Total Weakness Score			3,833333
	IFAS Score	1	84	1,68018

From Table 4.3, it can be seen that the total score for internal strengths in implementing green economy in rice agriculture in Sumbang District is 5.513514, and the total score for internal weaknesses is 3.833333. To calculate the IFAS score, subtract the total score for weaknesses from the total score for strengths. The IFAS score is 1.68018.

b) External Factors Strategy Matrix

The external factors strategy matrix consists of opportunities and threats. In this research, the external factors strategy matrix is used to analyze the opportunities and threats faced by rice agriculture in Sumbang District. The external factors strategy matrix is depicted as follows:

Table 4.4 External Factors Strategy Matrix

	External Factors	Weight	Ranking	Score
	Opportunities			

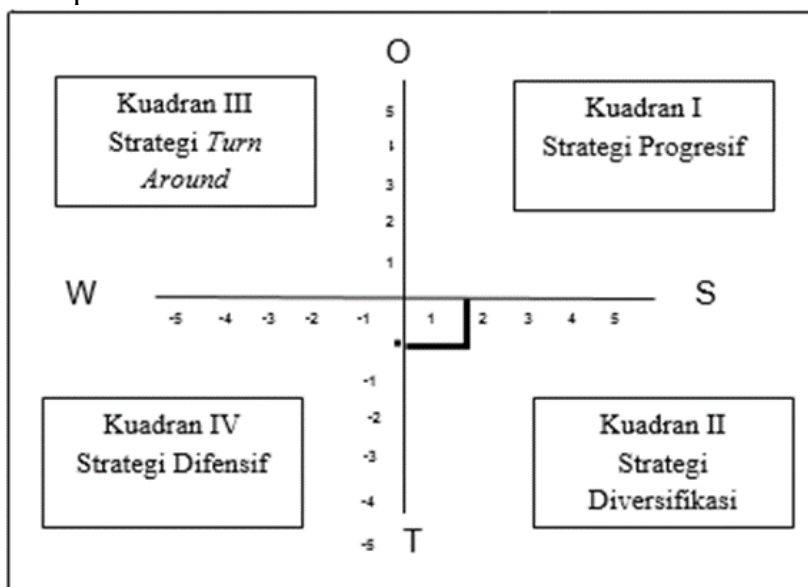
1.	Believe that reducing chemical use, maintaining a good environment, and promoting green economy awareness can provide opportunities for better agricultural economic development.	0,214286	4	0,857143
2.	Already prepared to adopt technologies such as organic fertilizer use.	0,142857	3	0,428571
3.	Potential to develop local and export markets for agricultural products.	0,142857	2	0,285714
4.	Potential to obtain funding or financial support from the government or institutions.	0,142857	3	0,428571
5.	Availability and access to knowledge and training on organic agricultural products already exist.	0,214286	2	0,428571
6.	Believe that the quality of the surrounding environment can support the transition to sustainable agriculture.	0,142857	3	0,428571
	Total Opportunity Score			2,857143
1.	Climate change poses a significant threat to agricultural production.	0,181818	3	0,545455
2.	High vulnerability of the agricultural sector to market demand and supply.	0,181818	3	0,545455
3.	Government's role in facilitating the transition from chemical-based agricultural products to organic products is still limited.	0,272727	2	0,545455
4.	Risks to the sustainability of resources supporting green economy and environmental-based agriculture in the high agricultural sector.	0,181818	3	0,545455
5.	Significant threat from global competition in the agricultural sector.	0,181818	4	0,727273

	Total Threat Score			2,909091
	EFAS Score	1		-0,05195

From Table 4.4, it can be seen that the total score for external opportunities in implementing green economy in rice agriculture in Sumbang District is 2.857143, and the total score for external threats is 2.909091. To calculate the EFAS score, subtract the total score for threats from the total score for opportunities. The EFAS score is -0.05195.

c) SWOT Quadrant Diagram

Based on the analysis of internal and external factors, the SWOT quadrant diagram can be depicted as follows:



Source: Processed Data 2023

Figure 4.1 SWOT Quadrant Diagram

The result of the internal and external factors matrix falls into Quadrant II or belongs to the diversification strategy with an IFAS score of 1.68 and an EFAS score of -0.05. To calculate the IFAS score, subtract the total score for internal weaknesses from the total score for internal strengths. Similarly, to calculate the EFAS score, subtract the total score for threats from the total score for opportunities. Based on these results, the most suitable strategy for implementing green economy in rice agriculture in Sumbang District is the S-T (Strengths-Threats) strategy. This means that rice agriculture in Sumbang District should leverage internal strengths to minimize external threats.

4.3 Discussion

After conducting data analysis using SWOT analysis, the researcher also conducted in-depth interviews with the respondents and observed the rice agriculture in Sumbang District. The results of the in-depth interviews and observations were used to reinforce the findings of the SWOT analysis.

4.3.1 In-Depth Interviews & Observations

a) In-Depth Interviews

During the interviews with the respondents, the researcher obtained various responses. Firstly, the farmers mentioned that they still rely on chemical agricultural products to ensure fast growth of rice plants. This is mainly because the majority of rice farmers in Sumbang District lease the land, and they need to maximize their income within a short period. Secondly, farmers prefer chemical agricultural products for time efficiency in farming practices. The Head of the Agricultural Extension Agency suggested an effective way to encourage rice farmers to use organic agricultural products would be through mandatory regulations imposed by the government, leaving them with no alternative but to adopt organic products.

b) Observations

During the field observations, the researcher observed that rice farmers still predominantly use chemical agricultural products rather than organic ones.

4.3.1 Appropriate Strategies to Implement

Based on the SWOT diagram, the most suitable strategy for implementing a green economy in rice farming in Sumbang District is the S-T approach (strengths - threats). In this context, rice farming in Sumbang District needs to leverage internal strengths to address potential threats from the external environment. In the pursuit of green economy goals, the focus will be on strengthening the positive factors possessed by rice farming in Sumbang District while considering and addressing the challenges that may arise from external factors that could affect the successful implementation of these strategies. The following are the appropriate strategies for rice farming in Sumbang District to implement a green economy:

a) Use of Organic Fertilizers

The use of organic fertilizers in farming supports the principle of environmental sustainability. Organic fertilizers are made from natural materials such as compost, manure, or other organic materials that naturally decompose in the soil. By reducing the use of chemical fertilizers and synthetic substances, this strategy helps maintain soil quality, biodiversity, and the ecological balance of the agricultural ecosystem.

b) Adequate Water Usage

Sufficient and non-excessive water usage is an essential part of sustainable farming practices. By optimizing water usage and implementing efficient irrigation practices such as drip irrigation or scheduled irrigation based on plant needs, green economy strategies encourage the conservation of water resources. This is important to maintain sustainable water availability for agriculture, the environment, and the community as a whole.

c) Reduction of Chemical-Based Farming Products

Reducing the use of chemical-based farming products contributes to environmental sustainability. Chemicals used in conventional agriculture can have negative impacts on soil quality, water, and biodiversity. By adopting sustainable farming practices and using natural alternatives such as organic fertilizers, organic pesticides, and environmentally friendly pest control methods, green economy strategies help maintain the ecological balance of the agricultural ecosystem and reduce negative impacts on the environment.

d) Government Incentives for Using Organic Farming Products

Providing greater encouragement from the government to farmers to use organic farming products can create a desire among farmers to adopt organic products. This can be done by gradually eliminating subsidies for chemical-based farming products and

gradually providing subsidies for organic farming products. If done gradually, this approach can be an effective way to incentivize the use of organic farming practices.

5. Discussion

5.1 Conclusion

Based on the data analysis and research findings presented earlier, it can be concluded that the most effective implementation of green economy in rice agriculture in Sumbang District is through diversification strategy, also known as the S-T strategy. This means that rice agriculture in Sumbang District should leverage its internal strengths to minimize external threats.

6. Conclusion

Based on the research findings, the following implications can be conveyed:

- a) The importance of supporting and facilitating the use of organic fertilizers in rice agriculture in Sumbang District. Policymakers can provide training, resources, and incentives to farmers to adopt environmentally friendly organic fertilizer practices. This can be achieved by ensuring easy access to organic fertilizers, implementing training programs, and offering incentives to encourage their use.
- b) The need to raise awareness and education regarding adequate and non-excessive water use in rice agriculture. Policymakers can involve farmers in education and training programs on efficient water management and sustainable irrigation practices. Providing information and technical support on measuring water requirements, using efficient irrigation technologies, and implementing proper irrigation schedules can help farmers maximize water efficiency.
- c) Support from policy-makers is necessary to reduce the use of chemical-based agricultural products. This can be achieved by providing environmentally friendly alternatives such as organic fertilizers and natural pesticides, as well as implementing strict supervision and control over the use of chemical pesticides. Policy-makers can also encourage research and innovation in developing more sustainable and environmentally friendly agricultural methods. The research findings are expected to serve as a study reference and source of information for the Ministry of Agriculture, the Agricultural Extension Agency in Sumbang District, and rice farmers in the area.
- d) The government needs to provide further incentives and policies to promote the use of organic agricultural products. This includes providing financial support, tax exemptions, and improving market access for organic agricultural products. Policy-makers can strengthen collaboration with non-governmental organizations, universities, and the private sector in promoting and supporting the production and marketing of organic agricultural products.

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