

Sustainable Food Agriculture Land Protection Strategy: a Case Study in Pantai Labu Sub-District, Deli Serdang Regency, North Sumatera Province

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Abstract. The agricultural land conversion phenomenon becomes a challenge in itself to embody a sustainable agricultural development, especially related to strengthening food security. Deli Serdang Regency as one of the rice production centers in North Sumatera Province is inseparable from the practice of land conversion, marked by a decrease in the agricultural land area, especially in the Pantai Labu Sub-district. This study aims to obtain the concept of sustainable food agricultural land protection which is necessary to anticipate the increasing conversion of agricultural land to non-agricultural land in Pantai Labu Sub-District, Deli Serdang Regency. The applied research method is a qualitative method, and the formulation of a protection strategy is performed using SWOT analysis. Based on the results of the study, a sustainable food agricultural land protection strategy wasn't only achievable from a juridical aspect but could also be supported by non-juridical strengthening of the strategy based on the SWOT analysis results by identifying internal and external factors. The obtained formulation of the strategies included the development of agricultural land based on the Regional Spatial Planning policy in order to create upstream-downstream synergies starting from the government, farmers, to the community and the preparation of convenient trade and distribution channels for farmers to be able to sell their agricultural products with good quality and price.

Keywords: land use conversion; SWOT analysis; protection strategy

1 Introduction

The fulfillment of food necessities in the future is a challenge for the Government of Indonesia, considering the increasing population growth. The existence of the agricultural sector is the foundation for realizing food security and stability in the future. In line with that, the availability of agricultural land is crucial to be protected. The dilemma is that Indonesia is also in the development current in various sectors where land is also a requirement, thereby sometimes there would be a competition for agricultural land and non-agricultural land. Early allocation of agricultural land needs to be implemented due to limited land resources in the future [1].

Control effort that has been carried out by the government is making policy through the issuance of Law Number 41 of the year 2009 concerning the Sustainable Food Agricultural Land Protection as amended by Law Number 11 of the year 2020 concerning Job Creation. This regulation is an instrument to protect agricultural land in Indonesia. Deli Serdang Regency has high potential for food agriculture activities and is one of the rice granaries

centers in North Sumatra Province, but in reality it is still influenced by the practice of land conversion. The parameter that can be applied to control land conversion is the preparation of the Regional Spatial Planning, the granting of location permits and regulations on land conversion[2]. The zoning of sustainable agricultural land has been included in the Deli Serdang Regency Regional Regulation Number 1 of the year 2021 concerning the Deli Serdang Regency Spatial Plan for 2021-2041. Pantai Labu Sub-district as a productive agricultural area is prioritized to become a sustainable agricultural area, but in reality in Pantai Labu Sub-district there has been a conversion of agricultural land use. Productive agricultural land becomes an important asset in agricultural development [3].

The attempt to protect sustainable food agricultural land is part of a shared responsibility, both across government sectors and also farmers. The government of Deli Serdang Regency should formulate strategies and policies to anticipate the increasing practice of agricultural land conversion through mapping agricultural land use zones. Availability of agricultural land is important considering the need for food is also increasing. The Regional Government of Deli Serdang Regency must consistently provide protection towards agricultural land in order to maintain the existence of food agricultural land. This study aims to describe the area of agricultural land that has changed functions in general in Deli Serdang Regency and in the study location, known as Pantai Labu Sub-District, and to formulate a strategy for protecting sustainable food agricultural land.

2 Method

This study utilized qualitative research method, a research method that is descriptive in nature, relies on analysis, refers to data, utilizes existing theories as supporting material, and produces a theory. Qualitative research method is a research method used to investigate, find, describe, and explain the quality or features of social influence that cannot be explained, measured or described through a quantitative approach [4].

The data in the study encompass primary and secondary data. Primary data were obtained from interviews with informants (in-depth interviews), related stakeholders, consisting of the Department of Agriculture for Deli Serdang Regency and Agricultural Extension Center (BPP) for Pantai Labu and also with farmers as agricultural business actors in the field. Secondary data were obtained from the National Land Agency (BPN), the Agriculture Department and the Central Statistics Agency for Deli Serdang Regency.

Determining strategy as an anticipatory attempt to protect sustainable food agricultural land using the SWOT method. SWOT analysis consists of Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T). SWOT analysis is based on logic that can maximize strengths (S) and opportunities (O), but simultaneously minimize weaknesses (W) and threats (T) [5]. SWOT analysis compares external opportunities and threats with internal strengths and weaknesses [5].

Researchers would collect external and internal aspect data with a qualitative approach through interviews with stakeholders who are responsible for the protection of sustainable food agricultural land in Deli Serdang Regency. Information obtained from in-depth interviews, and secondary data would be used as a reference for analyzing strategies using the SWOT method.

3 Results and Discussion

Generally, based on the data listed in the Research and Development Center of the Ministry of Agraria and Spatial Planning /Land Agency, Rice Field Statistics book of Deli Serdang Regency and Ministry of Agriculture [6] - [8], the paddy fields area in Deli Serdang Regency almost always decreased from year to year (in the last 10 years). The percentage of changed land area is listed in Table 1.

Table 1. Changes in the rice field area in Deli Serdang Regency

Number	Year	Land Area (Ha)	Changed Area (Ha)	Percentage	Remark
1.	2010	45.156	-	-	-
2.	2011	45.114	42	0,09	Decreasing
3.	2012	44.311	803	1,81	Decreasing
4.	2013	42.482	1.829	4,12	Decreasing
5.	2014	42.282	200	0,47	Decreasing
6.	2015	40.889	1.393	3,41	Decreasing
7.	2016	40.716	173	0,47	Decreasing
8.	2017	40.272	444	1,10	Decreasing
9.	2018	24.550	15.722	64,04	Decreasing
10.	2019	33.992	9.442	27,77	Increasing

Table 1. reveals the percentage of massive land area decline in Deli Serdang Regency that occurred every year, albeit a significant increase in 2019. This condition should be seriously heeded, if preventive measures weren't taken, agricultural land would keep on being diminished. Pantai Labu Sub-district as a productive agricultural area is prioritized to become a sustainable food agricultural land as stated in the Regional Spatial Planning of Deli Serdang Regency, however in reality, Pantai Labu Sub-district is inevitably affected by the practice of agricultural land conversion. Data on land use in the Pantai Labu sub-district in 2016 and 2019 obtained from the National Land Agency (BPN) of Deli Serdang Regency showed that during that period there had been a change in land use from agricultural to non-agricultural. Land use in Pantai Labu Sub-district in 2016 consisted of 69.13% (4,690.024 Ha) of agricultural land and 30.86% (2,093.89 Ha) of non-agricultural land, then in 2019 the agricultural land was 68.28% (4,631.82 Ha) and 31.72% (2,152.09 Ha) of non-agricultural land. Comparison of agricultural land area from 2016 to 2019 showed that there was a decrease in land area of 58.20 Ha or 0.85%.

In Pantai Labu Sub-district, as many as 15 out of 19 villages/urban villages had experienced the practice of land-use change of agricultural land, whether the initial function was irrigated rice field or moor/field. The decrease in agricultural land was due to the conversion of land from agricultural land to non-agricultural land, most of which was for settlement/village. Population growth would be in line with the demand for land needs. Land wouldn't increase, so what happened was land conversion which tended to reduce the proportion of land that was previously used for agricultural land to become non-agricultural land [9]. The occurrence of land conversion was due to competition in land use between the agricultural sector and the non-agricultural sector. Competition in land use could occur due to three economic and social phenomena, such as 1. limited land resources, 2. population growth and 3. economic growth [2]. The available land area is relatively limited, therefore, population growth would increase the scarcity of land that could be allocated for agricultural and non-agricultural activities [2].

The land area that experienced the most conversion of land use was <0.5 Ha which was used for the village (house), in the Binjai Bakung Villages. Similar to other village/Sub-district areas, many irrigated rice fields have turned into villages, such as in the areas of Durian Village, Denai Lama, Ramunia I and Perkebunan Ramunia village. In the area of Kubah Sentang Village, the most common land changes were the conversion of irrigated rice field into moor/field. Based on the land grouping, the moor/field is still defined as agricultural land, but the types of planted crops differed from rice in paddy field. The moor/field became a supporting land to produce crops other than rice, such as corn and cassava. The map of land-use change in 2016 – 2019 in Pantai Labu Sub-district can be found in Figure 1.

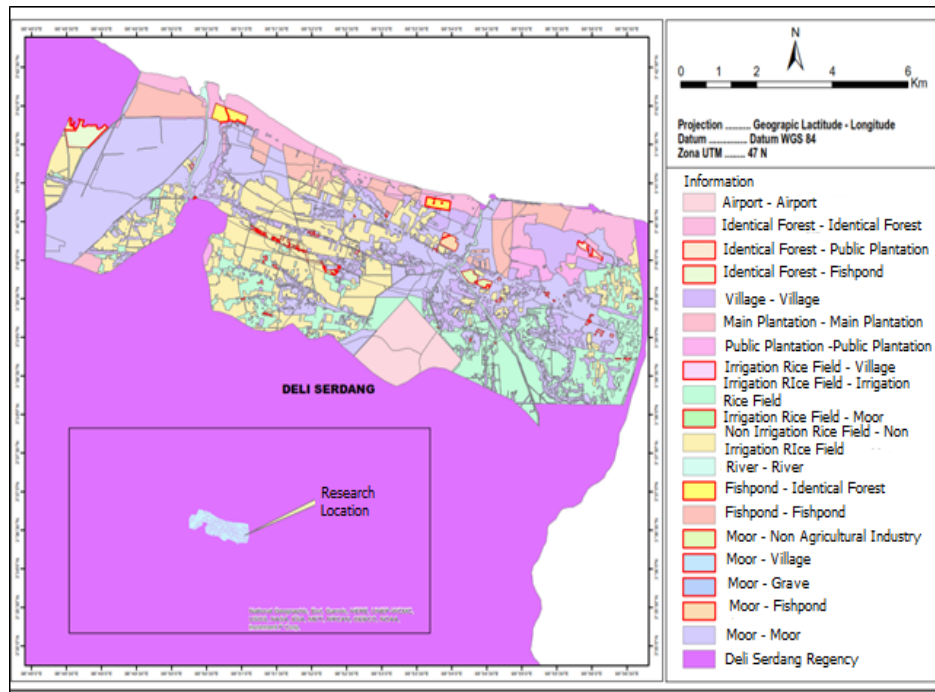


Figure 1. Land-use change in 2016 – 2019 in Pantai Labu Sub-district

The conservation of sustainable food agricultural land involves various complex elements. These elements can be analyzed from upstream to downstream, such as from the role of the government in formulating and issuing policies/statutory regulations, the role of farmers as the front liners of sustainable agriculture, the role of the Department of Agriculture and the human resources in field as extension workers, to consumers, the community who will become the end-users who consume agricultural products.

The attempt to protect agricultural land can be pursued through juridical factors by issuing regulations/policies and for the non-juridical way is by determining strategies through SWOT which analyzes strategies based on the internal and external environment. Agricultural land conversion is also influenced by external factors, internal factors and government policies[10].

Legally, the Government of Deli Serdang Regency has determined the zoning of food agricultural land that should be protected in the Deli Serdang Regency Regional Regulation

Number 1 of the year 2021 concerning the Deli Serdang Regency Regional Spatial Planning for 2021-2041. The regulation has determined Pantai Labu Sub-district as one of the sustainable food agricultural lands. In Chapter V (Regency Spatial Pattern Plan), article 29 paragraph 5) it is stated that the sustainable food agricultural land is part of the agricultural and horticultural land with an area of approximately 26.212,096 hectares, one of which is in Pantai Labu Sub-district [11].

Based on the non-judicial aspect, the results of the SWOT analysis would be able to support the sustainable food agricultural land protection program in terms of existing regulations, thereby its implementation could be maximized. The results of the SWOT analysis are presented in Table 2.

Table 2. SWOT Matrix for Sustainable Agricultural Land Protection

	Internal	STRENGTHS (S)	WEAKNESSES (W)
			S1. Availability of adequate sustainable food agricultural facilities and infrastructure S2. Potential of irrigated land and rice harvest intensity S3. The existence of government programs and policies in terms of improving the welfare of farmers S4. Potential for the conversion of non-agricultural land to agricultural land in accordance with Regional Spatial Planning S5. The huge number of Poktan (Farmers' Group)
	External		
	OPPORTUNITIES (O)	STRATEGIES S-O	STRATEGIES W-O
	O1. Availability of a sustainable food agricultural land protection program O2. A great number of unused land that can still be used O3. Huge demand for rice for Deli Serdang	1. The government empowers and provides supporting infrastructure for Poktan (Farmers' Group), thereby enabling them to manage sustainable food agricultural land and produce an agricultural product in order to excel from other commodity products (S1, S5, O1, O3, O4, O5) 2. The government prepares convenient trade and	1. Limited farmers' funds and traditional mindset can be overcome by the availability of facilities and infrastructure from the government such as subsidies for agricultural materials, human resources for field extension workers, etc. (W3, W4, W5, O1, O5) 2. Providing education and motivation to Poktan (Farmers' Group) about the importance of making sustainable agricultural

O4.	Regency and Medan City The growing consumer awareness towards products with good quality and safe consumption	distribution channels for farmers to be able to sell agricultural products of good quality and price (S3, S5, O3, O4, O5)	efforts that produce high quality and competitiveness in the market (W1, W2, W4, W5, O1, O2, O3, O4, O5)
O5.	Support towards the policy of the Provincial, Regency/City government	3. Sustainable agricultural land can be developed based on the Regional Spatial Planning policy, hence synergies can be created starting from upstream to downstream, such as from the government, farmers, to the community (S2, S4, S5, O1, O2, O5)	

		STRENGTHS	WEAKNESSES
Internal	S1.	Availability of adequate sustainable food agricultural facilities and infrastructures	W1. The decrease of Agricultural Land as Rice Field
	S2.	Potential of irrigated land and rice harvest intensity	W2. The quality of sustainable agricultural products has not been maintained
	S3.	The existence of government programs and policies in terms of improving the welfare of farmers	W3. Limited farmers' capital
	S4.	Potential for the conversion of non-agricultural land to agricultural land in accordance with Regional Spatial Planning	W4. The quality of farmers as human resources are still low and the traditional mindset must also be altered
	S5.	The huge number of Poktan (Farmers' Group)	W5. Limited human resources in the field
External			
THREATS (T)		STRATEGIES S-T	STRATEGIES W-T
T1.	Weak control over spatial control	1. The space utilization of agricultural land can be stopped by the issuance of laws and policies from the Government (S2, S4, T1, T2, T3, T4)	1. The government should facilitate Poktan (Farmers' Group) by providing facilities and infrastructure such as human resources for extension workers that are not only in accordance with competency standards, but also initiate creativity and invite farmers to think outside the box and produce agricultural products that are not less profitable than other commodities in order to be
T2.	Regional Spatial Planning consistency		
T3.	The high conversion of productive agricultural land use due to	2. The government and stakeholders can establish an agropolitan village in the Pantai Labu area in order to attract the interest of the younger generation and	

T4.	numerous public needs. Development of other commodities that are considered more competitive.	visitors who come, especially in the field of sustainable agriculture (S1, S2, S3, S4, S5, W1, W2, W3, W4)	more in line with the objectives of sustainable agricultural land development (W2, W4, W5, T2, T3, T4)
T5.	High interest rates and bank fees		2. The government can motivate Poktan (farmers' group) by cooperating with the person in charge or joint ventures with the private sector to enable the development of the quality of sustainable agriculture and agrotourism villages (W3, W4, O, O5))

4 Conclusion

Based on the results and discussion, there are some conclusions that could be drawn, and these conclusions are in the form of description of the land conversion area in the research location and the strategies established for the protection of sustainable agricultural land, as follows:

1. Land-use change in Pantai Labu Sub-district from 2016 to 2019 was 58.20 Ha or 0.85%. The decrease in agricultural land was due to the conversion of land from agricultural land to non-agricultural land, most of which was for settlements/villages.
2. Based on the results of the SWOT analysis which included internal and external factors, 9 strategies for protection of sustainable food agricultural land can be formulated, such as:
 - 1) The government empowers and provides supporting infrastructure for Poktan (Farmers' Group), thereby enabling them to manage sustainable food agricultural land and produce an agricultural product in order to excel from other commodity products.
 - 2) The government prepares convenient trade and distribution channels for farmers to be able to sell agricultural products of good quality and price.
 - 3) Sustainable food agricultural land can be developed based on the Regional Spatial Planning policy, hence synergies can be created starting from upstream to downstream, such as from the government, farmers, to the community.
 - 4) Limited farmers' funds and traditional mindset can be overcome by the availability of facilities and infrastructure from the government such as subsidies for agricultural materials, human resources for field extension workers, etc.
 - 5) Providing education and motivation to Poktan (Farmers' Group) about the importance of making sustainable agricultural efforts that produce high quality and competitiveness in the market.
 - 6) The space utilization on agricultural land can be stopped by the issuance of laws and policies from the Government.
 - 7) The government and stakeholders can establish an agropolitan village in the Pantai Labu area in order to attract the interest of the younger generation and visitors who come, especially in the field of sustainable agriculture.

- 8) The government should facilitate Poktan (Farmers' Group) by providing facilities and infrastructure such as human resources for extension workers that are not only in accordance with competency standards, but also initiate creativity and invite farmers to think outside the box and produce agricultural products that are not less profitable compared to other commodities in order to be more in line with the objectives of sustainable food agricultural land development.
- 9) The government can motivate Poktan (Farmers' Group) by cooperating with the person in charge or joint ventures with the private sector to enable the development of the quality of sustainable agriculture and agro-tourism villages.

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