

Analysis of Space Utilization in Development Planning in Serdang Bedagai Regency (Case Study: Rice Farming Cultivation)

Christiani Panjaitan

Department of Rural Development Planning

University of Sumatera Utara, Medan, North Sumatera, Indonesia



Abstract – Unsuitable spatial utilization can lead to development disproportion with the environmental sustainability, inadequate spatial use and decrease in the quality of space. The utilization of space in rice farming cultivation in Serdang Bedagai regency in the development planning shows that the effort to improve the utilization of spatial plan especially in rice farming cultivation is very necessary. The aim of the research is to know how far the spatial utilization of rice farming cultivation, to know land use conversion in rice farming and inhibiting factors of exploiting spatial planning development of rice farming cultivation in Serdang Bedagai regency. Descriptive and descriptive analysis method is done to know suitability of space utilization according to Spatial Plan Area. The results showed that there has been an increase in the allocation of wet land conversion by 1.26% as in the construction of toll road projects, oil palm plantations, crops (such as cassava and corn), settlements and other sectors. However, it is not significant with rice production in 2013 to 2016 which is increasing because it is supported from APBD funds of Agriculture and Irrigation Service with the development of agricultural infrastructure such as providing irrigation networks, ditch construction, road construction and intensification of agriculture by providing funding assistance to purchase paddy seeds, targets of subsidized fertilizers and forming farmer groups.

Keywords – Utilization of Agricultural Space; Land Use Conversion; Space Utilization barrier

I. INTRODUCTION

Regional spatial planning is basically to establish that there are parts of the zone that are expressly regulated in their use and some are not regulated. The parts of the unregulated territory are then assigned to the market mechanism. The utilization of the spatial plan of the region is so that the utilization provides prosperity as much as possible to the community both short and long term, supporting the defense and the creation of security (Tarigan, 2005).

In general terms spatial planning is a manifestation of space structure and pattern. Spatial structure is the composition of settlement centers and network systems infrastructure and facilities that serve as a supporter of socio-economic activities of the community who hierarchically have a functional relationship, while the spatial pattern is the distribution of space allotment in a region that includes allotment of space for the function of protection and designation of space for cultivation function.

Serdang Bedagai Regency is one of the areas that has great potential in agriculture, fishery and plantation sectors, as well as tourism accommodation. This potential becomes one of the cultivation areas for Serdang Bedagai Regency, where the cultivation area is a designated area with the main function to be cultivated based on the condition and potential of natural, human, and artificial resources. The cultivation area is an area outside the protected area.

In the spatial plan of Serdang Bedagai Regency 2013-2033 which is contained in Regional Regulation of Serdang Bedagai Regency number 12 of 2013 that Stipulation of cultivation area is focused on the effort to provide direction of development of various cultivation activities in accordance with the function of existing resources by paying attention to optimization of its utilization. The area of cultivation in the spatial plan of the Regency is intended to:

1. Providing guidance on the utilization of the space of the cultivation area optimally, efficient and effective, harmonious, balanced and sustainable.
2. Providing direction for changing types of space utilization between different cultivation activities.
3. Providing guidance for the change of space utilization type from the type of cultivation activity especially to the other cultivation

Unsuitable spatial utilization can lead to disproportion the development of environmental sustainability, wasteful use of space and degradation of spatial quality. Therefore, spatial planning is needed to regulate its utilization based on activity size, type of activity based on function, space quality and aesthetics especially on the cultivation of agriculture itself.

II. LITERATURE REVIEW

A. UTILIZATION OF SPATIAL PLAN

Implementation of a better spatial arrangement in the future materialized in Law / 26/2007 on Spatial Planning which contains the following basic provisions:

- a. Distribution of authority between the government, provincial government, and district / municipality government in the organization of the spatial planner.
- b. Spatial arrangements through the enactment of legislation including spatial guidelines as a reference for the organization of spatial planning
- c. Pembinaan penataan ruang melalui berbagai kegiatan untuk meningkatkan kinerja penyelenggaraan penataan ruang.
- d. Implementation of spatial planning in activities of planning, utilization and controlling of spatial use at all levels of government.
- e. Supervision of spatial planning that includes supervision on regulatory performance, guidance and spatial planning, including supervision of performance in fulfillment of minimum service standards in spatial planning.
- f. Rights, obligations, and the role of the community in the organization of spatial planning to ensure the involvement of the community.
- g. Settlement of disputes and spatial use conflicts, both between regions and among other stakeholders.
- h. The investigation regulates civil servant investigators, powers and mechanisms of action taken
- i. Provision of administrative and criminal sanctions.

In general, regional development planning is defined as a process and mechanism for formulating long-term, medium and short-term plans in areas that are linked to local conditions, aspirations and potentials by involving community

participation in order to support national development (Nasution, 2008).

According to Sirojuzilam (2011) regional development is an integral part of national development, which essentially is a planned effort to increase regional capacity in realizing a better future for the region and its people. Because the main responsibility of successful implementation of regional development is on Local Government then to every Local Government is given authority in accordance with its need to determine policy and development program in their respective area

The purpose of spatial planning is to create a harmonious relationship between the various activities under the sub-region in order to create a harmonious relationship. Thus, it accelerates the process of achieving prosperity and ensuring environmental sustainability. Space structure describes the pattern of space utilization and linkage between different spaces based on its use as well as the hierarchy of residential centers and service centers. The spatial use pattern describes the overall use of space. The pattern of controlling the use of space is the policies and strategies that need to be taken so that the space utilization plan can be controlled toward the desired target. At the district or city level control has been the provision and direction for each region and the way of monitoring and supervision (Tarigan, 2005).

B. PLANNING FOR DEVELOPMENT OF AGRICULTURAL CULTIVATION AREA

Spatial plans are undertaken to produce general spatial plans and detailed spatial plans. The general spatial plan is structured according to the administrative area approach with the substance that includes the structural and pattern of spatial plan (Saragih, 2015).

Cultivation area is an area that has the main function for cultivation based on the condition and potential of natural and human resources and artificial resources. This cultivation area should be utilized in a planned and directed, so that can be efficient and effective for human life. The cultivation area is generally an area outside that has been designated as a protected area (Adisasmita, 2010).

The cultivated area is directed towards its development in accordance with its potentials from the two sub-cultivation areas, as follows:

1. Sub-region of agricultural cultivation
 - a. Agricultural areas (wetlands and dryland)
 - b. Annual plant / plantation area.
 - c. Livestock and fishery areas.

2. Non-agricultural cultivation sub-region
 - a. Residential areas (urban and rural)
 - b. Industrial area, tourism
 - c. Mining and mineral areas.

To realize the development of crop agriculture area (wetlands and dry land) in accordance with the potential, space utilization policy, as follows:

- a. Expansion of wetland agriculture.
- b. Development of irrigation infrastructure to support the development of wetland agriculture.
- c. The controlled activities of land use conversion is relatively fertile and potential explicitly.

According to Adisasmita (2010) that the wetland cultivation area should be directed to areas with optimal land suitability and support of irrigation infrastructure. This wetland cultivation area is usually found in the area of tidal rice fields. Paddy rice development is done both through intensification and extensification. As for the cultivation of dryland food cultivation areas include areas for crops, horticulture or other food crops.

Table 1. Classification of Spatial Planning According to Law Number 26 Year 2007 on Spatial Planning

No	Classification of Spatial Planning
1	The main function of the area - Protected area - Area of cultivation
2	Administrative area - National spatial structure - Province spatial structure - Regency/city spatial structure
3	Area activities - Spatial structure of the urban areas - Spatial structure of the rural areas
4	Strategic area - Spatial structure of the national strategic areas - Spatial structure of the province strategic areas - Spatial structure of the regency strategic areas

Source: Processed Data Results from Deputy for Infrastructure and Regional Development Coordination, Coordinating Ministry for Economic Affairs, 2008.

C. FACTORS AFFECTING LAND USE CONVERSION

According to Letari in Muztopa (2011) defines the conversion of land use as a change of function of part or all of the land area from its original function becomes another function that becomes negative impact on the environment and the potential of the area.

According Irawan in Muztopa (2011) there are two things that affect the land use conversion. Firstly, in line with the construction of a residential or industrial estate in a land use conversion location, accessibility to the site is increasingly conducive to industrial and residential development that ultimately leads to increased demand for land by other investors or land speculators, resulting in increased land prices. Secondly, increasing land prices can further stimulate other farmers around to sell the land.

According to Winoto (2005) in Prayuga (2017) explained in his research that the factors that encourage the conversion of agricultural land, as follows:

1. Population factors, population increase and distribution in a region. The rapid increase in population has increased the demand for land.
2. Economic factors, high land rent in non-agricultural sector activities compared to the agricultural sector. Low incentives for farmers due to high production costs, while agricultural prices are relatively low and fluctuate.
3. Socio-cultural factors, such as the existence of inheritance law that causes fragmented agricultural land, so as not to meet the minimum limit of economically profitable business scale.
4. Myopic behavior, that is looking for short-term profits but less attention to long-term and overall national interest. This is reflected in the spatial plan that tends to encourage the conversion of agricultural land for non-agricultural land use.
5. The weakness of the legislation and law enforcement system of existing regulations.

Problems of decreasing rice fields can be overcome if local government is very tight in terms of spatial planning. The government must expressly prohibit the construction of

housing and industry that want to use land in agricultural areas. Decreasing wetland area can be prevented by making the agricultural sector as an attractive and respectable business opportunity naturally. Decreasing the area of land that occurs without control can cause problems of food security, environment and employment (Syahyuti in Sembiring, 2015).

III. RESEARCH METHOD

This study examines spatial use analysis in development planning in Serdang Bedagai Regency, rice farming cultivation case study. The population in this study are all employees and the community directly related to spatial use analysis in development planning in Serdang Bedagai Regency, in this case the Regional Planning Agency, Agriculture Agency, Water Resources Management Agency, Spatial Planning Service, and the Head and Secretary of the kecamatan as well as people who use rice fields in Serdang Bedagai Regency become the sample of the research, totally as 50 respondents..

Data analysis used is descriptive analysis of spatial and qualitative descriptive of land use of Serdang Bedagai regency to spatial plan of Serdang Bedagai region 2013-2033 with associated with utilization of farm land use area in Serdang Bedagai Regency.

Spatial descriptive analysis of the suitability of the Serdang Bedagai development program on spatial planning is done to determine the level of spatial plan utilization in supporting

agricultural development program. One approach can be done by looking at the suitability of the location of activities listed in the Regional Development Plans compared to the locations listed in the Main Program Indication in the spatial plan.

To determine the level utilization of spatial plan in the preparation of development programs and the reasons or factors that influence it, qualitative descriptive analysis is conducted. The results are obtained from the data processing of questionnaires related to the use or absence of spatial plans in the preparation of the proposed development program.

IV. RESULT AND DISCUSSION

The forum of regional development planning consultation is the final step in the planning process, in which the joint inspection of the Initial Draft document of the regency/city development work plan which is the result of a compilation of the Local Government Unit Work Plan which is a combination of the results of spatial and sectoral participatory processes (Development Planning deliberation of village, sub-district, regional work unit forum) and technocratic process. Although the draft of regency/municipal development planning is the final step in the deliberation of documents that have been prepared through the previous tiered stage, this forum should be both dialogical and equitable. Here is the percentage of respondents' answers about the plan for the utilization of agricultural cultivation space of the serdang bedagai regency in the development program.

Table 2. Percentage of Respondents' Responses on Spatial Utilization Planning for Agricultural Sector in Development Program in Serdang Bedagai Regency

Fosition	Spatial Utilization Plan of Agricultural Cultivation				Number of Respondents	
	Not Utilizing the Plan		Utilizing the Plan			
	Number of Respondents		Number of Respondents		(population)Percent (%)	
	(population)	Percent (%)	(population)	Percent (%)		
(1)	(2)	(3)	(4)	(5)	(6) = ((2)+(4))	(7) = ((3)+(5))
Head of Subdistrict	3	6.00	9	18.00	12	24.00
Secreatary of subdistrict	5	10.00	7	14.00	12	24.00
Regional planning agency	3	6.00	2	4.00	5	10.00
Spatial department	0	0.00	4	8.00	4	8.00
Agriculture department	0	0.00	6	12.00	6	12.00
Department of water resource management	0	0.00	4	8.00	4	8.00
Society	1	2.00	6	12.00	7	14.00
Total respondent	12	24.00	38	76.00	50	100.00

Source: Results of Data Processing, 2017

From the above table the percentage of respondents' answers about the development program utilizing the space for agricultural cultivation is as much as 76% of respondents and respondents who do not use the cultivation space of agriculture as much as 24% consisting of subdistrict secretary as much as 10% of respondents, head of subdistrict and regional planning agency respectively 6% of respondents, and from the community as much as 2% of respondents who do not take advantage. This happens because the respondents at the time of formulating the development program of the agricultural cultivation sector did not utilize the spatial plan of the region in Serdang Bedagai Regency.

One of the objectives of the regency/municipal development planning deliberation is to improve the Initial

Draft of the regional development work plan containing such priorities as regional development; indicative budget allocation based on program and function of regional apparatus unit; The design of the Village Fund Allocation and the proposed activities whose funding is derived from the provincial revenues and expenditure budget, national revenues and expenditure budget, and other funding sources. Next, to compile the details of the initial draft of the budget framework which is a procurement plan for goods and services that needs to be funded by the regional budget and revenue to achieve the development objectives. Here is the percentage of respondents' answers about the proposed budget plan for the spatial utilization of agricultural cultivation in the development program of Serdang Bedagai regency.

Table 3. Percentage of Respondents' Answer on Proposal of Spatial Utilization Plan in Agricultural Cultivation of Serdang Bedagai Regency in Development Program

Position	Spatial Utilization Planning of Agricultural Cultivation				Number of Respondents	
	Not Propose Budget		Propose Budget			
	Number of Respondents		Number of Respondents			
	(population)	Percent (%)	(population)	Percent (%)		
(1)	(2)	(3)	(4)	(5)	(6) = ((2)+(4))	(7) = ((3)+(5))
Head of Subdistrict	3	6.00	9	18.00	12	24.00
Secreatary of subdistrict	2	4.00	10	20.00	12	24.00
Regional planning agency	4	8.00	1	2.00	5	10.00
Spatial department	4	8.00	0	0.00	4	8.00
Agriculture department	1	2.00	5	10.00	6	12.00
Department of water resource management	4	8.00	0	0.00	4	8.00
Society	2	4.00	5	10.00	7	14.00
Total respondent	20	40.00	30	60.00	50	100.00

Source: Results of Data Processing, 2017

From the above table the percentage of respondents' answers about the proposed budget for the utilization of space plan of agricultural sector of Serdang Bedagai regency in development program utilizing space in agricultural cultivation is 60% of respondents. Meanwhile, the respondents who did not give the budget proposal in the utilization of agricultural cultivation space were 40% consisting of head of subdistrict 6%, subdistrict secretary 4% of respondents, and local planning agency respectively 8% respondents, Spatial and resource management water, each 8% of respondents, Agriculture Agency as much as 2% of respondents, and from among the community as much as 4% of respondents. This happens because the respondents during the process of preparing the proposed development program in Serdang

Bedagai regency never proposed budget in the agricultural sector in the program.

From the above table the percentage of respondents' answers about the proposed budget for the utilization of space plan of agricultural sector of Serdang Bedagai regency in development program utilizing space in agricultural cultivation is 60% of respondents. Meanwhile, the respondents who did not give the budget proposal in the utilization of agricultural cultivation space were 40% consisting of head of subdistrict 6%, subdistrict secretary 4% of respondents, and local planning agency respectively 8% respondents, Spatial and resource management water, each 8% of respondents, Agriculture Agency as much as 2% of respondents, and from among the community as much as 4% of respondents. This

happens because the respondents during the process of preparing the proposed development program in Serdang Bedagai Regency never proposed budget in agriculture sector in the development program at the time of Development Planning Deliberation was conducted. The legal basis in the implementation of spatial planning, the Law Number 26 Year 2007 on Spatial Planning is expected to realize spatial plans that can optimize and align the various activities of the

development sector, both in the utilization of natural and artificial resources. Land is a natural resource of choice, applicable in 1 point 3 of Law No. 41 of 2009 on Sustainable Land Protection of Food Agriculture is a system and process in planning, developing, utilizing and nurturing, controlling, and supervising agricultural land and its surroundings in a sustainable manner (Isa, 2013).

Table 4 Percentage of Respondents' Answer on Use of Spatial Plan in the Spatial Utilization Plan of Agricultural Sector Serdang Bedagai regency in Development Program

Position	Spatial Use Planning Plan of Agricultural Cultivation				Number of Respondents	
	Not Using Spatial Plan		Using Spatial Plan			
	Number of Respondents		Number of Respondents		(6) = ((2)+(4))	
	(population)	Percent (%)	(population)	Percent (%)		
(1)	(2)	(3)	(4)	(5)	(6) = ((2)+(4))	(7) = ((3)+(5))
Head of Subdistrict	1	2.00	11	22.00	12	24.00
Secreatary of subdistrict	2	4.00	10	20.00	12	24.00
Regional planning agency	1	2.00	4	8.00	5	10.00
Spatial department	4	8.00	0	0.00	4	8.00
Agriculture department	0	0.00	6	12.00	6	12.00
Department of water resource management	4	8.00	0	0.00	4	8.00
Society	3	6.00	4	8.00	7	14.00
Total respondent	15	30.00	35	70.00	50	100.00

Source: Results of Data Processing, 2017

From the above table the percentage of respondents' answers about the use of spatial planning in agriculture sector of Serdang Bedagai Regency in agricultural development program is 70% of respondents. While the respondents who did not use the spatial plan were 30% consisting of 2% Camat, 4% as much as 4% of respondents, and local planning agency for 2% of respondents, Spatial and Processing of water resources respectively 8% of respondents, as well as from the community as much as 6% of respondents. This happens because respondents do not use spatial plan as one of the criteria in selecting the proposed development program, especially in agricultural cultivation in Serdang Bedagai regency.

V. CONCLUSIONS AND SUGGESTIONS

A. CONCLUSIONS

Based on secondary data, primary and field observation result, there has been an increase of rice field function in Serdang Bedagai Regency, a very clear change occurred in the Dolok Masihul Subdistrict where it is reduced by 20.58% (-500 ha). The increase in wetland rice fields in Serdang Bedagai as a whole is 1.26%, land allocation to other sectors such as toll road project development, oil palm plantation, crops (such as cassava and corn), settlements and other sectors. Although the increase of wet land conversion is 1.26% but it is not significant with agricultural cultivation of paddy fields that have increased production from 2013 until 2016. The cause of the increase in production of rice fields is due to the support of funds from the Regional Budget and expenditure Department of Agriculture and Watering and

supported also by the development of agricultural infrastructure such as the provision of irrigation networks, ditch construction, roads and increased agricultural intensification by providing funding assistance to purchase paddy seeds, subsidized fertilizer targets and even the formation of farmer groups. The inhibiting factor in the utilization of space in Serdang Bedagai Regency is the lack of socialization regarding the local regulations on Spatial Plans, especially rice farming to the community so that the community do the land use conversion of agricultural land. Community participation in development planning can be a means of community empowerment because the community is given the opportunity to express its proposals and have the opportunity to play a role in the decision-making process. The Government of Serdang Bedagai Regency is expected to provide incentives such as tax relief, compensation, provision of infrastructure etc. to defend rice fields and impose disincentives such as high taxation, infrastructure restrictions, compensation, penalty and so on in development planning especially in cultivation development rice farming.

B. SUGGESTIONS

From the results of the above research, it is proposed some suggestions as follows:

1. Completeness and accuracy of spatial information data in Serdang Bedagai Regency is still limited so that there needs to be a breakthrough and Geographic Information System Technology (GIS) to anticipate the shortage.
2. The need for socialization of the Regional Regulation on Spatial Planning of Serdang Bedagai Regency, especially the utilization of rice field farming space so that people do not convert their land, especially agricultural land.
3. To the community, especially farmers do not convert the use of land to maintain food security stability in Serdang Bedagai regency considering that Serdang Bedagai regency is one of rice granary regency in North Sumatra.
4. The Government of Serdang Bedagai Regency is expected to provide policies to the public such as tax relief incentives, granting compensation, provision of infrastructure and so on to defend rice fields and impose disincentives such as high taxation, infrastructure restrictions, imposition of compensation, penalties and so on in development planning, especially in the development of cultivation of rice farms considering the land use plan is not in accordance with the existing conditions of land use.

REFERENCE

- [1] Adisasmita, Rahardjo, 2010. *Pembangunan Kawasan dan Tata Ruang*. Yogyakarta: Graha Ilmu.
- [2] Muztopa, Zaenil dan Pubayu Budi Santosa. 2011. *Analisis Faktor-Faktor Yang Mempengaruhi Alih Fungsi Lahan Pertanian di Kabupaten Demak*,
- [3] Nasution, Arifin. 2008. *Perencanaan Pembangunan Daerah*. Medan: FISIP USU Press.
- [4] Prayuga Anandhio. 2017. *Analisis Dampak dan Laju Alih Fungsi Lahan Sawah di Kecamatan Tamansari Kabupaten Bogor* [Jurnal]. Institut Pertanian Bogor. Bogor.
- [5] Saragih, Jef Rudiantho. 2015. *Perencanaan Wilayah dan Pengembangn Ekonoi Lokal Berbasis Pertanian Teori dan Aplikasi*. Yogyakarta: Pustaka Pelajar.
- [6] Sembiring, Praja, dkk. 2015. *Faktor-faktor Yang Mempengaruhi Luas Lahan Sawah di Kabupaten Serdang Bedagai*. Medan. Fakultas Pertanian Universitas Sumatera Utara.
- [7] Sirojuzilam. 2011. *Problematika Wilayah Kota dan Daerah*. Medan. USU Press.
- [8] Tarigan, Robinson. 2005 *Perencanaan Pembangunan Wilayah Edisi Revisi*. Jakarta: Bumi Aksara.