

Study of Enviromental Approaching on Lake Toba

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Abstract: The region development of Lake Toba requires of Regional Spatial Planning (RSP), and RSP should be able to save the natural resources and the environment that become the pre-eminent Lake Toba area. The challenge of managing natural resources is better, with the emergence of regional autonomy since 2001, since its approach emphasizes the administrative approach rather than the ecological or bioregion approach. This indicates the need for a study on the SPR called Strategic Environmental Assessment (SEA) which is the discussion of failure or it may be said imperfection of methods or models that have been applied in the protection and management of the environment can be overcome. SEA should be the basis for spatial arrangement, then spatial arrangement underlying the development of Lake Toba area. Thus, spatial planning that is not based on good SEA, will result in spatial planning that is not organized; As well as the development of areas that do not base themselves on good spatial planning will result in the development of areas that are not harmonious and sustainable to the area of Lake Toba in Simalungun Regency

1 INTRODUCTION

Regional development is a regional spatial policy in order to exploit the natural resources potential of the existing region to improve the welfare of the community. Spatial planning has an important role in the implementation of development for the realization of sustainable development in the form of giving a tangible contribution in the development of sustainable areas and cities, so that justice and prosperity for the people of Indonesia can be achieved. The role of natural resources in this case becomes very important because as an object of development or development of the region. Natural resources (NR) is everything that is obtained from the physical environment to meet the needs and desires of mankind.

Sustainable development is a development based on the principle of economic growth, environmental conservation and social stability to improve human welfare, both current and future generations without causing damage to the environment and ecosystems. According to Law No. 32 of 2009 on Environmental Protection and Management, sustainable development is: A conscious, planned effort that combines environmental, social and economic aspects into development strategies to ensure

environmental needs and safety, capacity, well-being and quality Living the present generation and future generations.

The problems of sustainable development are complex. This can be identified from the lack of development of tourism sector in Lake Toba area, where the number of tourists tends to decline, which seen decrease in the number of foreign tourists in 2011 amounted to 21,988 people to numbered 16,492 people in 2012 (BPS Simalungun Regency, 2013).

Lake Toba is one of the vulkano-tectonic lake, due to the process of land terban (subsidence) in the middle formed Samasir Island with a mering position to the western arena and in other parts of its lower position inundated surface water to form a lake (Bapedaldasu,

2005). However, the beauty of the panoramic estitika and any potential natural resources (NR) of the region threatened its function preservation due to unequal development pressure between economic, social and environmental development. According to Jayakusuma (2011), in the last two decades the rate of damage to natural resources and environmental pollution in Indonesia has been increasing steadily and showing no signs of decline. If two decades ago the rate of forest destruction in Indonesia at tengarai

about 1 to 1.2 million per year, has now reached 2 million hectares per year.

The high population growth, urbanization, industrial, agricultural and fishery flows around the lake are the greatest threat to the environmental degradation of the lake. Consequently, the diversity of lake biota is reduced, water quality declines, and silting due to water hyacinth and sedimentation, thus affecting environmental function. In addition, agricultural development has not been able to prosper the community, this is due to: 1) lack of water discharge of Lake Toba) and 2) irrigation farming system is not fulfilled. To prevent the above mentioned in the development of the region with programs that are environmentally sound with the aim of preventing damage, maintaining equilibrium and maintaining natural sustainability (Mulyanto, 2008).

The region development of Lake Toba requires of Regional Spatial Region (RSP), and RSP should be able to save the natural resources and the environment that become the pre- eminent Lake Toba area. Proper management of natural resources and environment is highly dependent on its management capacity, both human resource, organizational, institutional and regulatory capabilities (Muller and Glodde, 1994). The challenge of managing natural resources is better, with the emergence of regional autonomy since 2001, since its approach emphasizes the administrative approach rather than the ecological or bioregion approach (Hardiyanto, 2003). This indicates the need for a study on the SPR called Strategic Environmental Assessment (SEA) which is the discussion of failure or it may be said imperfection of methods or models that have been applied in the protection and management of the environment can be overcome. The government with thorough studies has adopted concepts and models that have been applied by several countries in the world, developed and developing countries, as an alternative in maintaining the sustainability of development in Indonesia. Integrating environmental interests at a strategic decision-making level, ie at the policy level, plan or program through the Strategic Environmental Review is the choice of government- implemented measures in the Environmental Protection and Management Act.

Law No. 32 of 2009 on Environmental Protection and Management requires the Government and local governments to make a strategic environmental assessment (SEA) to ensure that the principle of sustainable development has become the basis and integrated in the development of a region and / or

policies, plans and/or program. In other words, SEA results should be the basis for development policies, plans and / or programs within a region. If the SEA results state that the carrying capacity and capacity have been exceeded, such policies, plans and / or development programs shall be improved in accordance with SEA recommendations and any business and/or activities that have exceeded environmental carrying capacity and capacity shall no longer be allowed.

In the last two decades along with the increasing knowledge in the field of environmental studies, has also developed various understanding of SEA which reflects the differences in interpreting the purpose of SEA. So that there is no definition of SEA which is universally embraced by all parties. However, there are generally four types of definitions or definitions of SEA, namely: According to Sadler and Verheem in Jayakusuma (2011) SEA is a systematic process to evaluate the environmental consequences of a proposed policy, plan or program in order to ensure that the consequences are as early as possible In the process of parallel decision making with social and economic considerations.

According to Therievel et al, in Jayakusuma (2011) SEA is a comprehensive, systematic and formal process to evaluate the environmental effects of the plan's policies, or the following alternative programs, including the preparation of documents containing the findings of such evaluations and using such findings to produce decision making that has Public accountability.

DEAT and CSIR in Jayakusuma (2011) defines SEA is the process of integrating the concept of sustainability in strategic decision making. Brown and Therievel define SEA is a process intended for those responsible for policy development (initiators) (at policy formulation) and decision makers (at the time of policy approval) with a view to providing a holistic understanding of the social and environmental implications of policy design, With the focus of the study beyond the issues that were originally a factor driving the birth of new policies.

Brown and Therievel in Jayakusuma (2011) defines SEAs as a process intended for those responsible for policy development (initiators) (at policy formulation) and decision makers (at the time of policy approval) with a view to providing a holistic understanding of social implications and The environment of policy design, with the focus of the study beyond the issues that were originally the driving force behind the birth of a new policy.

Implementation of SEA as mandated by Law no. Law No. 32 of 2009 on Environmental Protection

and Management has short and long term implications for the government at national, provincial and district/city levels, especially for the Directorate General (DG) of Regional Development which has the main duty and function of facilitating the implementation SEA at the provincial and district / city levels.

The Directorate General of Regional Development has conducted pilot testing of SEA implementation since 2007, after SEA was introduced in Indonesia through Danish Government Assistance through Environmental Support Program (ESP) since 2005. The results of SEA implementation testing in the context of regional development planning in several regions have given some lessons or inputs to develop strategies for implementing SEA in Indonesia for short, medium, and long term. Based on input from SEA Experts, both international consultants and national consultants, that capacity building is required in the implementation of SEAs at the policy and planning level. Particularly in integrating, integrating and synchronizing Regional Spatial Planning and Long Term Development Planning, and Medium Term at provincial and district/city levels. It is intended that the implementation of SEA as a mandate of Law No. 32/2009 can be done more practical and applicable both in terms of process and the effectiveness of time and funding.

In relation thereto, in 2010 a review of institutional and stakeholder and human resource strengthening was carried out for SEA implementation at the Central and Regional Offices. Institutional, stakeholder and human resource studies for SEA implementation are prepared as an inseparable part of a legally formal consultation, participation and extension plan related to the planning and implementation process of development both at the national, provincial, To the district /city level in implementing of Strategic Environmental Assessment (SEA). Based on Bapedaldasu Report (2011) Simalungun District Government has not yet integrated the environmental aspect on economic and social aspects. The environmental conditions of Simalungun Regency in RPJPD Simalungun Regency 2005-2025 described as follows:

a) the increasing number of people, the conversion of agricultural lands into the form of settlement areas, the destruction of forests will be more severe due to the irresponsible behavior of certain parties who exploit the forest on a large scale.

b) forest encroachment will be higher intensity because it is supported by energy crisis and high selling price of crude oil in the market, so this condition forced the community to get alternative energy from forest wood around the settlement location.

c) collection of excavated materials of class C whose number is increasing from year to year, will cause the river habitat to be damaged.

d) clean water crisis is expected to be a serious threat not only to meet domestic water needs but also for industrial and agricultural purposes. This is because the water catchment and water catchment areas decrease or switch function.

e) water pollution will be higher due to waste disposal into the river without going through the processing first.

From the above conditions, very minimal development priorities in the area of Lake Toba. Simalungun Regency is very interested in the maintenance and improvement of water quality of Lake Toba to support tourism activities in Prapat, Tigaras, Haranggaol and other areas.

Although it has been born some of the policies by the government (both central, provincial and district governments for the management of Lake Toba area, among others is the Regional Regulation No. 1 of 1990 on Lake Toba Lake Toba Lake Area Management Plan (LTEMP), Lake Toba Regional Management, North Sumatera Regulation No. 7 of

2003 on the General Plan of Spatial Planning of North Sumatera, Pergub No. 1 Year 2009 on the Stipulation of Water Quality Standard of Lake Toba, but these policies have not been able to support the Lake Toba area.

Based on the above, a study is needed to analyze: (1) the impact of SEA implementation on spatial planning in Simalungun Regency, (2) to analyze SEA implementation on the development of the area in Lake Toba area of Simalungun Regency, and (3) to analyze the effect of spatial planning on the development of the area in Lake Toba Simalungun Regency.

2 RESULTS AND DISCUSSION

2.1 The Influence of SEA Implementation on Spatial Planning

The purpose of this research is to analyze the influence of SEA implementation on spatial

planning in Simalungun Regency. The summary of the research results can be seen in Table 1.

Table 1: The Summary of Results the Influence of SEA Implementation On the Spatial Planning in Simalungun Regency

No	Variables Dimensional	Coefficient	t-count	Prob
1	constant	.073		
	Policy	.984	3.843	.000
	Plan	.550	2.516	.014
	Program	.897	3.600	.001
R ² = .735				
Prob. F = .000				

Source: Research Results are Processed (2016)

In Table 1: shows that the SEA implementation tested to answer the first question proved to have an effect on the spatial planning in Simalungun Regency. This result means that SEA implementation variable is an important factor in planning of spatial planning in Simalungun Regency. Testing to answer this first question is the three dimensions of SEA implementation variables under study ie policies, plans and programs of SEA proved to have a significant positive effect on spatial planning in Simalungun Regency.

Through this research can be constructed and produced a model to know whether the SEA variable, that is Policy (Po), Plan (Pl) and Program (Pr) in a region can be utilized for improvement of spatial planning (SP). The intended model is that spatial arrangement can be improved or influenced by SEA, with the mathematical model as follows:

$$SP = a + Po + Pl + e \tag{1}$$

Based on the above model can be said that if the spatial plan to be improved then the policies, plans and programs SEA should be optimized. The position of the three dimensions of SEA variables in relation to spatial arrangement in Simalungun Regency can be illustrated as shown in Figure 1:

Figure 1 shows that there are three factors: policies, plans and programs of the SEA that have a role in spatial planning in Simalungun Regency. These three factors constitute a unity that cannot be separated in the SEA implementation effort to improve spatial planning.

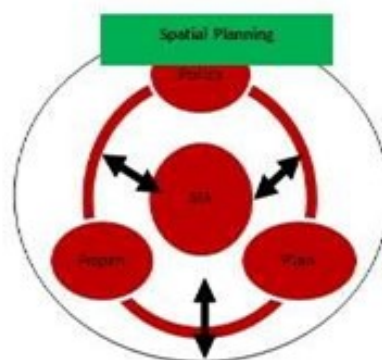


Figure 1: Three factors of SEA have a role in spatial planning

2.2 The Influence of SEA Implementation On the Regional Development of Lake Toba Area in Simalungun Regency

The purpose of this study is to analyze the influence of SEA implementation on the regional development of Lake Toba area in Simalungun Regency. The summary of the research results can be seen in Table 2.

Table 2: The Summary of Results the Influence of SEA Implementation On the Regional Development of Lake Toba Area in Simalungun Regency

No	Variables Dimensional	Coefficient	t-count	Prob
1	(constant	-1.285		
	Policy	2.359	5.054	.000
	Plan	1.021	2.565	.012
	Program	1.320	2.906	.005
R ² = .766				
Prob. F = .000				

Source: Research Results are Processed (2016)

Table 2: shows that SEA application tested to answer the second question proved to have an effect on the development of Lake Toba area in Simalungun Regency. This result means that SEA implementation variable is an important factor in planning the development of Lake Toba area in Simalungun Regency, where the three dimensions of SEA implementation variables studied are SEA policies, plans and programs proved to have a significant positive effect on the development of Lake Toba Area in Simalungun Regency.

Through this research can be constructed and produced a model to know whether the implementation of SEA variables, namely Policy (Po), Plan (Pl) and Program (Pr) in a region can be utilized for the improvement of regional development (RD). The intended model is that regional development can be improved or influenced by SEA, with the mathematical model as follows:

$$RD = a + Po + Pl + Pn + e \tag{2}$$

Based on the above model it can be said that if the development of the region wants to be improved then SEA policies, plans and programs must be optimized. The position of the three dimensions of SEA implementation variables in relation to regional development in Simalungun Regency can be illustrated as shown in Figure 2:



Figure 2: Three factors of SEA have a role in regional development

Figure 2 shows that there are three factors: the SEA policies, plans and programs that have a role in the development of Toba Lake area in Simalungun Regency. These three factors constitute a unity that cannot be separated in the SEA implementation effort to improve regional development.

2.2 The Influence of Spatial Planning on the Regional Development of Lake Toba Area in Simalungun Regency

The purpose of this study is to analyze the influence of spatial planning on the regional development of the Lake Toba Area in Simalungun Regency. The summary of the research results can be seen in Table 3.

In Table 3: shows that the spatial arrangement tested to answer the third question proved to have an effect on the development of Lake Toba area in Simalungun Regency. This result means that spatial

planning variable is an important factor in planning the development of area in Simalungun Regency, where the three dimensions of spatial variables studied are planning, utilization, and control of spatial planning proved to have a significant positive effect on the development of the region in Simalungun Regency.

Table 3: The Summary of Results the Influence of Spatial Planning Implementation On Regional Development of Lake Toba Area in Simalungun Regency

No	Variables Dimensional	Coefficient	t-count	Prob
1	(constant	5.947		
	Policy	2.245	9.946	.000
	Plan	.591	2.470	.015
	Program	2.165	7.911	.001
R ² = .942				
Prob. F = .000				

Source: Research Results are Processed, 2016

Through this research can be built and produced a model to know whether the implementation of SEA variables, namely Planning (P), Utilization (U) and Control (C) in a region can be utilized for the improvement of regional development (RD). The intended model is that regional development can be improved or influenced by the application of spatial planning, with the mathematical model as follows:

$$RD = a + P + U + C + e \tag{3}$$

Based on the above model can be said that if the development of the region wants to be improved then planning, utilization, and control the implementation of spatial planning should be optimized. The position of the three dimensions of spatial application variables in relation to the development of the region in Simalungun Regency can be illustrated as shown in Figure 3.

Figure 3 shows that there are three factors, namely planning, utilization, and control of spatial planning that have a role in the development of Lake Toba area in Simalungun Regency. These three factors constitute a unity that cannot be separated in an effort to implement spatial planning to improve regional development.

Based on model equations 1, 2 and 3, a model can be developed to determine whether the application of Strategic Environmental Assessment (SEA) and spatial planning (SP) can be utilized to improve regional development (RD).



Figure 3: Three Factors of Spatial Planning have a role in Regional Development

The intended model is that regional development can be improved or influenced by SEA implementation and spatial application, with the mathematical model as follows:

$$RD = a + SEA + SP + e \quad (4)$$

Based on the above model can be said that the development of the area of Lake Toba want to be improved then the application of SEA and the implementation of spatial planning must be optimized. The position of variables of SEA implementation and spatial application to the development of Lake Toba area of Simalungun Regency can be described as shown in Figure 4:



Figure 4: The Role of SEA and Spatial Planning on Regional Development

Figure 4: shows that SEA implementation and spatial planning can increase the development of Lake Toba area in Simalungun Regency. Both variables are interconnected in an effort to improve regional development.

Regional development is the utilization of space conducted by the government, private and community, whether done jointly or individually will provide progress for the developing region. The Government plays a role in opening road access for

the community of a region to interact with other regions. Road is the access of means of transportation from one region to another. Private sector plays a role in opening a good business industry sector, trade and services. The public plays a role in opening their own business and selling their agricultural products. The isolated area can cause the community to have difficulty in conducting economic activities, access to education and health facilities, thus causing the community to take longer time and distance in carrying out such activities, which consequently people have to spend more on the activities. Sirojuzilam (2005) suggests that regional development basically means increasing the benefit of the region for the community of a certain region capable of accommodating more residents, with the level of community welfare that on average many facilities / infrastructure, goods or services are available and business community activities Which increases, both in terms of type, intensity, service and quality.

The results of this study corroborate the research conducted by Lepa, et al (2011) concluded that: 1) PPP in RSP Kabupaten Bolaang Mongondow has the value of the relationship of 84.24%, the principle of balance 79.59%, the principle of fairness 83.72%, with SEA value of 82.52%; 2) Identified 9 issues of sustainable development have a negative impact, and 1 issue has a positive impact; And 3) How to mitigate the negative impacts of integrating SEA values for articles that have not fully SEA or medium-to-moderate SEH values have a negative impact on the environment. Furthermore, Dariah (2012) study stated that the difference of SEA implementation of one sector and multisector lies in the scope of study and implementation technique. In terms of substance, one sector and multisectoral SEAs have in common the identification of strategic issues, priority PPP identification, PPP impact assessment on strategic issues, the preparation of alternative recommendations and recommendations.

Gunn and Noble (2009) states that the strategic environmental assessment of the region is the most appropriate framework for addressing the cumulative effects of environmental impacts in support of sustainable development. Kornov, et al (2015) suggests that the implementation of SEA in the Copenhagen spatial plan shows that the role of plan serves as an innovator in the SEA process. Furthermore Stoeglehner, et al. (2009) concluded that the role of planners in SEA implementation is very important for environmental effectiveness.

3 CONCLUSIONS

Protection and environmental management of the Lake Toba region mainly lies in the determination of the meaningful use of space use as well as the utilization of the resources in it. With this clear allocation, then all the interests associated with the utilization of Lake Toba area can be accommodated so as to achieve harmonization in the utilization of space which in turn realize the added value of the use of a safe, comfortable, productive and sustainable.

SEA should be the basis for spatial arrangement, then spatial arrangement underlying the development of Lake Toba area. Thus, spatial planning that is not based on good SEA, will result in spatial planning that is not organized; As well as the development of areas that do not base themselves on good spatial planning will result in the development of areas that are not harmonious and sustainable to the area of Lake Toba in Simalungun Regency.

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REFERENCES

- Environment Agency of North Sumatra Province., 2011. Materials of Strategic Environmental Review of Lake Toba Area. Environment Agency of North Sumatra Province. Field.
- Dariah, A.R., 2012. Implementation of Strategic Environmental Assessment (SEA) One Sector and Multisector: A Comparative Study. Proceedings of National Seminar on Research and PKM: Social, Economy, and Humanities, Vol. 3 (1): 319-326.
- Gunn, J.H. And B.F. Noble., 2009. Integrating Cumulative in Regional Strategy Environmental Assessment Frameworks: Lessons from Practice. Journal of Environmental Assessment Policy and Management, Vol. 11 (3): 267-290.
- Hardiyanto, G., 2003. Regional Autonomy and Challenges for the Conservation of Natural Resources, Presented at the National Seminar on "Autonomy and Environment" held by KAMU
- Fak Geografi UGM in Yogyakarta, April 20, 2003, www.damar.or.id.damaryogya@ygy.centrin.net.id.

- Jayakusuma, Z., 2011. The Importance of Strategic Environmental Studies in the Protection and Management of the Environment in Indonesia. Journal of Law Science. 2 (1); Pp. 154-167.
- Kornov, L.B, J. Zhang and P. Cristensen., 2015. The Influence of Street Level Bureaucracy on The Implementation of Strategic Environmental Assessment. Journal of Environmental Planning and Management, Vol. 58 (4): 598-615.
- Lepa, A.A. , B.J.V. Polli and J. Husain., 2011. Strategic Environment on Spatial Planning of Bolaang Mongondow Regency Year 2011-2030. Eugenia, Vol. 17 (3): 234-243.
- Muller, H., and Glodde., 1994. The Round Table as a Program, Institutional Development caught between the Environment and Development - Options and Limitations, GTZ, Division 44 Environmental Policy and Institutional Development in Environment Unit: 9-122.
- Mulyanto. H.R., 2008. Principles of Regional Development. Graha Science. Yogyakarta.
- Sirojuzilam. 2005. Regional Planning and Development. Green Rides. Journal of Regional Planning and Development. Graduate School of the University of North Sumatra. Field. 1 (1); Pp. 10-14.
- Stoeglehner, G., A.L. Brown and L.B. Kornov., 2009. SEA and Planning: 'Ownership' of Strategic Environmental Assessment by The Planners is The Key to its Effectiveness. Impact Assessment and Project Appraisal, Vol. 27 (2): 111-120.
- Law No. 32 of 2009 on Environmental Protection and Management.