Research Article

Controlling conservation functions of peat lands at Langgam District, Pelalawan Regency of Riau Province

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Abstract: Forest fires in Langgam District, Pelalawan Regency of Riau Province is caused environmental damage which impact on many aspects, especially the social and economic. This study was aimed to identify the natural environment, the impact of deforestation and land, and the potential problems to the spatial environment and to manage of land conservation and the environment. The methodology used in this study-included quantitative analysis with interviews, GIS spatial analysis and qualitative analysis. Results of this study indicated that the destruction of forests covering about 45.71% of total land in Riau Province was peat land. Sixty six percent of the destruction was directed to the use of land and forest production. There were 11 fire spots in the Langgam District. Results of SWOT analysis indicated non-integrated the estate management, lack of coordination among stakeholders, non-integrated institutional management and forestry and plantations, lack of budget, large illegal logging and land conversion made by private and public institutions.

Keywords: environmental, conservation, degradation, peat land, spatial

Introduction

Riau Province became one of the interesting issues to be discussed. This is caused by many factors including land use as it did in Pelalawan, Riau Province. Forest conversion causes environmental damage because of forest fires that occur continuously. This will have an impact on many aspects, especially the social and economic (Anwar et al., 1984). Even from this impact is not only about the disadvantaged communities but also about the wider community beyond the local community affected by the effects of smoke pollution caused by peat fires (Warman, 2011).

For that, we need to pay attention to these environmental benefits to be gained by maintaining the presence of each component of the environment for future utilization, known as conservation. Conservation to preserve, maintain and preserve something of the built environment and the natural environment, such as protection against natural disasters, river conservation and natural scenery, environmental conservation needs to be done to peat lands in Langgam District as vulnerable peat forest fires. According to Rijksen

(1981), conservation is a form of cultural evolution in which conservation can be seen in the economic and ecological conservation economically which means trying to allocate resources for now, while the ecological conservation of a natural resource allocation for the present and future. Conservation is an environmental conservation effort but still consider the benefits gained at that time while maintaining the presence of each component of the environment for future utilization.

According to Law no. 4 in 1982, the conservation of natural resources is a form of natural management to ensure prudent utilization of renewable resources and to ensure continuity of supply while maintaining and enhancing the value and diversity. The national conservation strategy has been formulated into the following three implementations:

1. Life Protection Buffer System (LPBS) that includes zoning LPBS, determination of LBPS archetype, coaching programs, strengthening the utilization area of LBPS, use and cultivation of land in the area, and

controlling LBPS for maximum exploitation in LBPS waters.
2. Preservations of plants, animals, and their ecosystems that includes preservation of plant animal diversity
3. Sustainable use of biological resources and ecosystems that require the utilization of a nature conservation area of environmental conditions, and the use of plants and wildlife.

This study was aimed to identify the natural environment, the impact of deforestation and land, and the potential problems to the spatial environment and to manage of land conservation and the environment of Langgam District, Pelalawan Regency of Riau Province.

Material and Methods

The method used for this study was descriptive quantitative method to create a description of the situation or event, to explain the relationship between phenomena, and to make predictions and get the meaning and implications of a problem to be solved. This study was conducted by observing a case study on the Langgam District, Pelalawan Regency. Identification of field conditions of land use was done by identifying the mapping technique through analysis of aerial photographs of the study area supported with observation data as well as other supporting data. Methods used for this study were similar to those used by Yoza (2013) and Yusuf (2013). Summary of the method is presented in Table 1.

Table 1. Research Method

Target	Variable	Method
Identification of forest and peat land destruction	Area of peat land Degraded peat lands	Descriptive Analysis and Qualitative Analysis of GIS through secondary data and field observations
Identification of land conservation	Problems Potential Opportunities Challenge	Descriptive analysis through field observations
Strategies of land conservation and environmental	Output targets 1 and 2	Descriptive qualitative interviews

Result and Discussion

Destruction of forests and peat lands

Peat area is an area with soil forming elements of mostly organic material that are buried for a long time. Under the Act no.26 of 2007 on Spatial Planning, Government Regulation no.26 of 2008 on National Spatial Plan states that peat areas are protected areas that provide as conservation area.

The protection of peat is intended to control hydrology of the region that serves as a mooring water and prevention of water, as well as protecting the unique ecosystem of the concerned region. Peat region is defined by the criteria of 3 meters or more that were found in all districts, especially that of districts in Pelalawan Regency. The total peat land area in Pelalawan regency is 4,105,242 ha or 45.71% of the total land in the Province of Riau (Table 2 and Figure 1). This conditions describe Riau has high vulnerability to ecological disaster. This is because the characteristics of peat:
1. The ability to store water 15-20 times the weight of dry peat (hydrological functions).

2. Hydrophobicity/dry so prone to fires.
3. The ability of removing water toward greater horizontal than the vertical so dry and flammable.

Table 2. Peat areas at Pelalawan Regency

No	District	Area (ha)	Percent
1	Langgam	45,763	5.97
2	Pangkalan Kerinci	17,243	2.25
3	Kuala Kampar	70,125	9.15
4	Ukui	414,845	54.12
5	Pangkalan Lesung	18,648	2.43
6	Pangkalan Kuras	134,753	17.58
7	Teluk meranti	18,753	2.45
8	Kerumutan	9,008	1.18
9	Bunut	10,780	1.41
10	Pelalawan	9,640	1.26
11	Bandar Seikijang	5,960	0.78
12	Bandar Petalangan	10,943	1.43

Source: Pangkalan Kerinci District, Pelalawan Regency (2007)

Rate of forest degradation

Analysis of the results showed that natural forest in Riau, especially which in Pelalawan Regency has entered a critical phase with the rate of degradation of 100,000 ha/year. Based on the results of the study, 50% of total peat lands were no longer forested as on Riau RTRWP because it has been converted to aquaculture activities. Currently there is only 22.9% of the land area of Riau is converted by natural forest. Data presented in Figure 1 show that degradation would occur around 17.87% of the land area of Riau will be converted for the purpose of cultivation or about 5.13% of the land area in Riau that will be left.

Use of industrial plant forest

Based on data of Jikalahari (2012), 66% of the area is directed to the use of production forest, and the remaining 23.64% is for the plantation (Table 3).

Table 3. Land use in Riau

No	Land Use	Area (Ha)	Percent (%)
1	Fixed production forest areas	1,457,379	66.87%
2	Plantation / annual plant areas	525, 294	23.64%
3	Plantation areas and others	43, 250	1.98%
4	Agricultural areas	163, 254	7.49%
5	Industrial areas	275	0.01%

Source: Jikalahari (2012)

Data presented in Table 3 show that the licensing of Industrial Plantation Forest has relatively high portion. This led to massive forest fires that occurred in Langgam District, Pelalawan Regency of Riau Province. Pelalawan land cover map is presented in Figure 1.
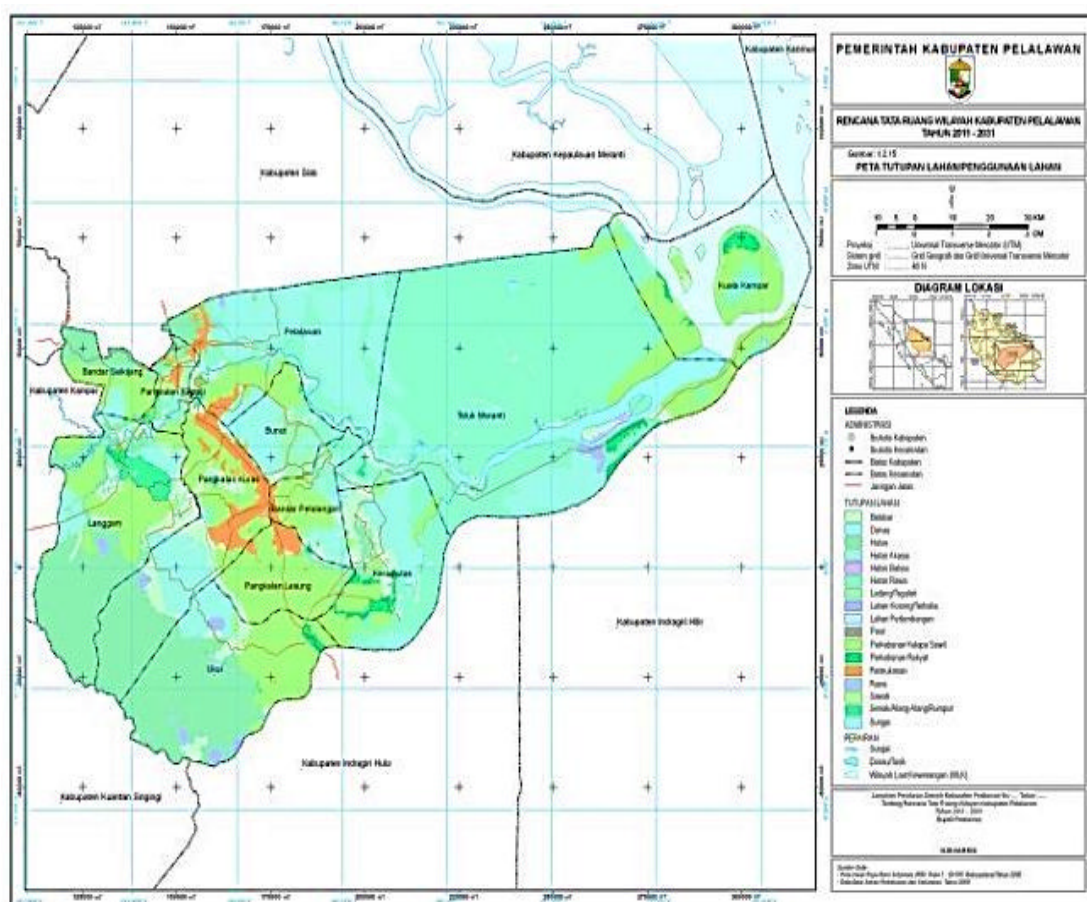

Figure 1. Land Cover of Pelalawan
Source : Pemerintah Kabupaten Pelalawan (2011)

Distribution of forest fires

Peat land areas that are susceptible to forest fire are located in the Langgam, Ukui, Pangkalan Lesung, Bunut, Pelalawan, Kuala Kampar, Kerumutan, Teluk Meranti, Bandar Seikijang, and Bandar Petalangan Districts. Environmental issues related to forests are forest fires that cause of smog. Potential prone of forest fire forests or peat lands that cause smog are primarily concerned with land clearing by burning, and fires on forest/peat in the downstream region. Conversion of peat land in large scale caused some area at Langgam District became fire spots. Results of observation showed 11 spots comprising 2 spots at Segati Village, 3 spots at Sotol Village, 1 spot at Tambak Village, 2 spots at Langkan Village, 1 spot at Penarikan Village, and 3 spots at Langgam Village (Figure 2).

Land conservation

Based on the results of the research with interviews and secondary data collection, SWOT analysis (Strength, Weakness, Opportunity, Threat) of Langgam District is presented in Table 5.

Figure 2. Distribution of Hot Spot in Riau
Source : Jikalahari (2012)

Table 5. Identification of land conservation at Langgam District

SWOT	Aspect
Strength	• Regional autonomy
	• Plantation potential
	• Potential of industrial plantation forest
Weakness	• Management of plantation has not been integrated
	• Weak coordination among stakeholders
	• Institutional management of forestry and plantations have not been integrated
	• Small budget
Opportunity	• Involvement of stakeholders
Threat	• Illegal logging
	• The large land conversion made by private and community institutions

Land and environmental conservation strategies

Based on the results of the study by combining field observations and secondary data, strategies of controlling land and environmental conservation are as follows:

1. Establishing integrated conservation area at Laggam District through the Spatial Plan by incorporating elements of peat land studies as a protected area.
2. Reviewing the use of Industrial Plantation Forest area contained in the Spatial Plan which particular plantation forest industry including peat.
3. Conducting control measures of conservation areas by implementing integrated planning stages, management, rehabilitation which includes natural regeneration, artificial natural regeneration, reforestation using native trees, commercial reforestation, community-based reforestation and agroforestry and community-based conservation stages.
4. Management, regulation and licensing of forestry.
5. Preparation of legislation in conservation planning and industrial plantation forest in the form of regulations, Decree, etc.
6. Integration of forest management between stakeholders.

Conclusion

1. Forest destruction covered about 45.71% of total land of Riau Province; 66% of the area was directed to the use of land and forest production. There were 11 fire spots in the Langgam District comprising 2 spots at Segati Village, 3 spots at Sotol Village, 1 spot at Tambak Village, 2 spots at Langkan Village, 1 spot at Penarikan Village, and 3 spots at Langgam Village.
2. Results of SWOT analysis indicated non-integrated the estate management, lack of coordination among stakeholders, non-integrated institutional management of forestry and plantations, small budget, large illegal logging and land conversion made by private and community institutions.
3. Conservation area control strategy needs to be developed to minimize the impact of forest fires caused by land conversion in Riau Province.

Acknowledgements

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