

# MANGROVE ECOTOURISM OPPORTUNITY SPECTRUM AT SOUTH COAST OF BANGKALAN PROVINCE OF EAST JAVA

Oleh:

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## **ABSTRACT**

*Mangrove areas at South Coast of Bangkalan-Madura that supported by the Suramadu Bridge is one of area that has tourism potential. Mangrove resources which to establish ecotourism were built based on some criteria. As policy response, this project can be used by local government to manage mangrove biodiversity in this area. The study aims to identify and to map the opportunity types of ecotourism in the south coastal area of Bangkalan. Defining the potential mangrove ecotourism area at this study was constructed on the basis of Recreation Opportunity Spectrum (ROS). They are focuses on ecological conditions and facilities. Its main objective is to attain consistency in the management of recreation through the integration of recreation and resource management planning. The ROS identifies a spectrum of recreation opportunities on a criteria ranging from Primitive to Semi-primitive to Roded Natural to Rural to Urban/developed for 3 sub-district that divided into 16 stations. Mapping the tourism potential regions was done the application of remote sensing and geographic information system; then, proceed by the index of naturalness and remoteness of ROS. Mangrove ecotourism opportunity spectrum analysis at the south coast of Bangkalan shown that no one region are classification in the primitive category, is an category that show the area is very appropriate to developed for ecotourism region. This is because many mangrove areas in south coast of Bangkalan Madura directly adjacent to residential areas, aquaculture and agricultural cultivation, so the development of the area of mangrove ecotourism can be done in two areas with semi-primitive criteria. Each has an area 28.284 ha (Langpanggang) and 9.392 ha (Suwa'an) respectively.*

Key words: Mangrove, ecotourism, ROS

## **INTRODUCTION**

The tourism sector is a fast-developing activity in the coastal and marine areas, so as to increases local revenues (Kim and Kim 1996 and Orams 1999). One of the coastal regions with huge potential to be managed and developed for tourism is the south coast of Bangkalan, province of East Java. This is supported by the Suramadu bridge existence that connecting Surabaya and Madura island as an icon that can be sold as an attraction. Therefore, directly or indirectly, may trigger an increase in the number of visitors to tourist resorts, especially on the southern coast of Bangkalan.

One of the potential for tourism on the south coast Bangkalan is a mangrove that can be built based on environmental issues (ecotourism). This is because ecotourism has become new tool to promote cultural tourism and eco-friendly to make it more interesting. Ecotourism has unique characteristics that require special management system so that tourists can enjoy their stay and at the same time maintaining the natural environment (FAO 2009). Additionally, ecotourism can help conservation and community development resources. Thus, ecotourism can be an alternative choice for the economic exploitation of mangrove resources (Han *et al.* 2003). One of which is to establish ecotourism, mangrove areas at there were built based on some criteria. As policy response, this study can be used by local government to restore and conserve mangrove biodiversity in this area. Based on the above description, the purpose of this study is to identify and define the ecotourism potential of the mangrove area in south coast Bangkalan by mangrove ecotourism opportunity spectrum. As policy response, this project can be used by local government to restore and conserve mangrove biodiversity in this area.

Mangrove ecotourism opportunity spectrum is a number of frameworks exist that might help to understand physical activity across settings and recreation management areas. Among them, the Recreation Opportunity Spectrum (ROS) is the most widely known and applied framework (Manning 1999). The framework provides managers a systematic way to consider the combination of biophysical, social, and managerial attributes present in an area and then create recreation opportunities based upon their combination. Based on that combination of attributes, the ROS system identifies land classes with their own recreation experience opportunities.

ROS is a macro inventory tool that categorizes characteristics of public land areas, but mangrove ecotourism opportunity spectrum classifies characteristics of a region or tourist destination as like as Tourism Opportunity Spectrum (TOS) which especially at mangrove areas. The Tourism Opportunity Spectrum (TOS) which is developed by Butler and Wallbrook (1991) *in* Jurowski (2010) and be refined by Dawson (2001) is an adaptation of ROS that provides a conceptual approach to tourism planning on a continuum from ecotourism to urban environments. It is designed to provide an overview of tourism opportunities to facilitate a comprehensive planning approach for a broad array of tourism opportunities.

## **METHOD**

### **Site Study**

Study locations covering all the potential mangrove tourism on the south coast Bangkalan (Madura Island) East Java Province, which is located between coordinates 112° 41' 20 " - 113° 02' 00" east longitude and 7° 08' 20 " - 113° 13' 30" south latitude along 40 km. Study site was divided into 16 stations spread over 3 sub-districts (Kamal, Kwanyar and Modung). The study was conducted over six months from March to September 2010.

### **Analytical Integrative Models**

The Mangrove Ecotourism Opportunity Spectrum method constructed on the basis of Recreation Opportunity Spectrum (ROS). The parameters and indicators of this method were modified from Newman *et al* (2001) and Yulianda (2007). It was inventory and map selected setting attributes of mangrove areas experiences using GIS. Setting attributes were defined in terms of indicators and

standards of quality and addressed ecological and facilities components of mangrove areas experiences that modified from Table 1. Data on these indicators were obtained through a field survey. Subsequent GIS analysis was permitted development of maps displaying the current and desired condition of all indicators.

Table 1. The indicators and standards of quality within ROS

<b>Physical Setting</b>	<b>Primitive</b>	<b>Semi-primitive</b>	<b>Roaded Natural</b>	<b>Rural</b>	<b>Urban/developed</b>
Remoteness	3 miles from any interstate, county or BLM system roads or isolated by topography	0.25-1 mile from interstate, county or BLM system roads, or isolated by topography	May include areas within 1 mile of interstate, state, county or BLM roads	No distance criteria	No distance criteria
Minimum Size	5,000 acres	1,000-2,000 acres	No size criteria	No size criteria	No size criteria
Evidence of Humans	Essentially unmodified natural environment	Natural setting with some subtle modifications	Natural setting with easily noticed dominant modifications	Modified natural setting with dominant modifications continually noticeable	Structurally Dominated setting, with natural elements subordinate.
<b>Social Setting</b>					
User Density	Less than 6 parties encountered per day on trails. Less than 3 parties encountered in camping areas.	Less than 15 parties encountered per day on trails. Less than 6 parties encountered in camping areas.	Moderate to high frequency of encounters with other parties.	High frequency of encounters with other parties,	Near constant encountered with other parties.

Source: Snake River Birds of Prey NCA Appendix 15

### **Mangrove Ecotourism Opportunity Spectrum**

The Mangrove Ecotourism Opportunity Spectrum is a more specialized tool that describes opportunity zone of mangrove to be an ecotourism area. Mapping zones of mangrove ecotourism opportunities was done by calculation of score matrix of assessment condition around study areas. The matrix was obtained through the opinions of experts who understand the condition of the area then consider the class of regions based on ecological indicators and the existing facilities so that the zone or spectrum obtained ecotourism mangrove

area according to the paradigm of ROS. This method as like as Ecotourism Opportunity Spectrum (ECOS) that was constructed by Açıksöz *et al.* (2010) based on paradigm ROS and TOS (Tourism Opportunity Spectrum) to solve the problems related to the protection and management of the natural areas.

The ROS and TOS are a way of formalizing this need for diversity by providing a spectrum of recreational opportunities. In terrestrial environments this spectrum of opportunities has been divided into five land management classes, which range from 'primitive' to 'urban' type settings (Driver and Brown 1978; Clark and Stankey 1979 *in* Ormsby *et al.* 2004). Each setting has different levels of physical alterations to the environment, different levels of remoteness, size, encounters with others, and different levels and types of management actions (Kaltenborn and Emmelin 1993 *in* Ormsby *et al.* 2004). The indicators and standards of quality to be included in the study are shown in Table 2 and the classifications within mangrove ecotourism opportunity spectrum described in Table 3.

Table 2. The indicators and standards of quality to be included in the study

Indicators	Categories				
	Primitive	Semi-primitive	Roaded Natural	Rural	Urban/developed
<b>Standards</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Ecological</b>					
Thickness (m)	>500	>350-500	>200-350	>50-200	<50
Density (indv/m <sup>2</sup> )	<=15	12-<15	9-<12	5-<9	<5
Number of Mangrove species	>4	4	3	1-2	0
Biota object	>4	4	3	2	One of them
<b>Facilities</b>					
Access roads (m)	>4000	>3000-4000	>2000-3000	>1000-2000	<1000
Important places	Fishing ground	Marine/aquaculture	Agriculture	Residence	Tourism/rehabilitation

Sources: Modified Newman *et al.* (2001), Aukerman (2004), Yulianda (2007)

Spectrum class values or recreation zone obtained from suitability index values the region into percentage (Yulianda 2007). It aims to simplify the classification of mangrove eco-tourism zone. Recreation spectrum/zone index were determined by following formula:

$$RZI = \sum \left[ \frac{N_i}{N_{\max}} \right] \times 100\%$$

RZI : Recreation Zone Index

N<sub>i</sub> : Value of Parameter-i

N<sub>max</sub> : Maximum value entire categories

Table 3. The classification within mangrove ecotourism opportunity spectrum and their characteristics

<b>% Spectrum</b>	<b>ROS</b>	<b>Class Descriptions</b>
>80%	Primitive	Opportunity for isolation from man-made sights, sounds, and management controls in an unmodified natural environment. Only facilities essential for resource protection are available. A high degree of challenge and risk are present. Visitors use outdoor skills and have minimal contact with other users or groups. Motorized use is prohibited.
>60-80%	Semi-primitive	Some opportunity for isolation from man-made sights, sounds, and management controls in a predominantly unmodified environment. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk and to use outdoor skills. Concentration of visitors is low, but evidence of other area users is present. On-site managerial controls are subtle. Facilities are provided for resource protection and the safety of users. Motorized use is permitted.
>40-60%	Roaded Natural	Mostly equal opportunities to affiliate with other groups or be isolated from sights and sounds of man. The landscape is generally natural with modifications moderately evident. Concentration of users is low to moderate, but facilities for group activities may be present. Challenge and risk opportunities are generally not important in this class. Opportunities for both motorized and non-motorized activities are present. Construction standards and facility design incorporate conventional motorized uses.
>20-40%	Rural	Area is characterized by a substantially modified natural environment. Opportunities to affiliate with others are prevalent. The convenience of recreation sites and opportunities are more important than a natural landscape or setting. Sights and sounds of man are readily evident, and the concentration of users is often moderate to high. Developed sites, roads, and trails are designed for moderate to high uses.
0-20%	Urban/developed	Area is characterized by a substantially urbanized environment, although the background may have natural-appealing elements. High levels of human activity and concentrated development, including recreation opportunities are prevalent. Developed sites, roads and other recreation opportunities are designed for high use.

## RESULT AND DISCUSSION

Identification of satellite image showed that mangrove density at south coastal of Bangkalan District still quite good, especially in Modung Sub-district. Recreational opportunities of mangrove ecotourism zone on the south coast Bangkalan built based on biophysical assessment and facilities parameters. Overlay to the assessment of these indicators yield map of status of mangrove ecotourism potential. The results could be used as materials for area management plan and will be a tool for developing a comprehensive planning approach for managing tourist activities in natural environments so that a wide range of mangrove ecotourism opportunities could be evaluated as a destination becomes increasingly popular. Continue were identified for two parameters with several indicators. Basic factors are closely related to the factors used in ROS: access, other non-adventure uses, tourism plant, social interaction, acceptability of visitor impacts and acceptability of regimentation. The sub factors in mangrove ecotourism opportunity spectrum are more specify those in ROS and TOS.

Result of the analysis of mangrove ecotourism opportunities zone on the south coastal of Bangkalan showed that no region was at a primitive category. This are caused width of mangrove areas as parameter ware not met by all locations. Ecotourism potential of mangrove area on the south coastal Bangkalan mostly located in the category of roaded natural. There are 3 locations in the category Rural, 3 locations included in the category urban/developed and 2 locations which is a category of semi-primitive (analysis in Table 2). 3 locations with the urban criteria is center of sub-district government, so that having the lowest score in the analysis of mangrove eco-tourism potential in the south coast of Bangkalan. In addition, it is caused many mangrove areas in south coast of Bangkalan Madura directly adjacent to residential areas, aquaculture and agricultural cultivation. Mangrove ecotourism opportunities zone had based on analysis of the spectrum with ecological indicators and facilities producing zones as in Figure 1.

Location of observation with semi-primitive category is a region with great potential to develop as mangrove ecotourism in south coastal of Bangkalan. They are mangrove of area of Langpanggang and Suwa'an Sub-district. Each has an area 28.284 ha (Langpanggang) and 9.392 ha (Suwa'an) respectively. This is supported by unspoiled mangrove forests in both locations. According Thomas and Fernandez (1994), one was through the development of Mangrove-tourist resort that has a role in the conservation and maintenance of mangrove ecosystems. In addition, the south coast is an area Bangkalan that intersect directly with the Surabaya-Madura Bridge (Suramadu) that has an important role of tourism.

Table 4. Evaluation of ecotourism potential of the settlements through mangrove ecotourism opportunity spectrum method

		Ecological				Facilities		Total Point	% Spectrum
		Thicknes s (m)	Dens ity (indv /m <sup>2</sup> )	Num ber of Man grove species	Biot a obje ct	Acce ss road s (m)	Impo rtant plac es		
Kamal	Tajungan	0	3	3	1	0	2	9	37,50
	Banyuajuh	1	2	2	1	1	0	7	29,17
Kwanyar	Kwanyar Barat	0	0	1	0	0	0	1	4,17
	Pesangrahan	0	4	3	4	0	2	13	54,17
	Batah Timur	0	4	4	1	0	1	10	41,67
	Batah Barat	0	4	3	3	0	0	10	41,67
	Karang Anyar	1	4	4	1	0	4	14	58,33
Modung	Tebul	0	0	1	0	0	1	2	8,33
	Langpanggan g	1	4	3	4	0	3	15	62,50
	Serabi Barat	0	2	2	1	0	3	8	33,33
	Pangpajung	1	4	4	4	0	0	13	54,17
	Patengteng	1	4	2	4	0	0	11	45,83
	Suwa'an	1	4	4	3	0	3	15	62,50
	Modung	0	4	3	3	1	2	13	54,17
	Karanganyar	1	4	2	3	0	1	11	45,83
	Patereman	0	2	1	0	0	0	3	12,50

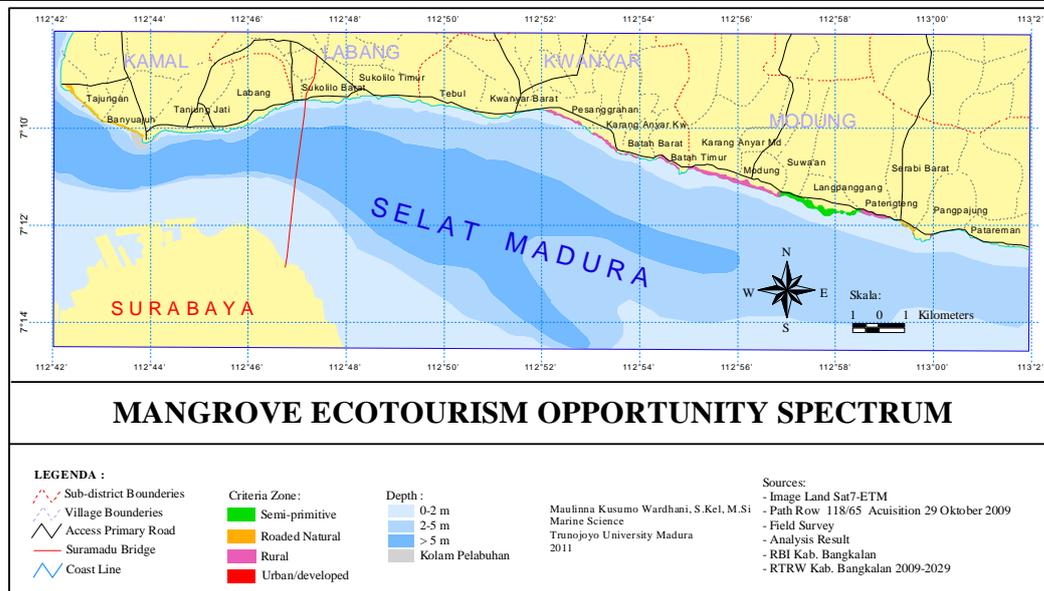


Figure 1. Map of mangrove ecotourism opportunity spectrum at South Coast Bangkalan

Kasim (2006) states that the key to develop a tourist area are those areas should distinctive and unique to seen and felt. Mangrove forests have a tour through the attraction value of flora and fauna associated in the ecosystem. This is because the mangrove forest is a habitat for several types which are categorized in three groups that have activities that are interconnected, i.e. aquatic-biota, semi-aquatic, and terrestrial. In addition, the mangrove ecosystem is one of the habitats of wild animals including primates, reptiles, birds and some components of estuarine ecosystems which are important in life especially migratory waterfowl. Mangrove resources with unique formations vegetation, wildlife and the associations that exist in the mangrove ecosystem has the potential to be sold as a tourist attractions, especially ecotourism offers a concept of education and conservation. On the other hand, facilities and infrastructure management and visitor services needed for tourism development should be sufficient to attract visitors or tourists.

Tourist areas development is supported by the existence of facilities and utilities. Facilities supporting tourism activities in this location is not adequate so that necessary development. This can be seen from the public facilities located in southern coastal areas Bangkalan form of access roads and utilities in the form of electricity, telephones, clean water and waste management. Condition of the road to tourist attraction sites are paved roads with a width of 4-6 meters and good enough to pass buses, trucks and mini buses and private vehicles. This road connects Bangkalan and Sampang through the southern path. However, coverage of public transport vehicles to villages located in the east of the highway-Bangkalan (Kamal) is still limited to the amount of the fleet. This differs from the reach of public transport services in the middle lane and north Bangkalan with a fleet of more and wider roads 6-8 m. Thiele *et al.* (2005) stated that the presence of these tours have a positive relationship with indicators of compliance and access, but a negative relationship with indicators of quality of life and ongoing activity, so that the necessary regulations and policies of a more thorough examination of the costs and benefits associated with tourism activity.

## **CONCLUSIONS AND IMPLICATIONS**

The result of this study shown that no one region were classification in the primitive category which is very appropriate to developed for ecotourism region. This is because many mangrove areas in south coast of Bangkalan Madura directly bordering to residential areas, aquaculture and agricultural cultivation. Thus, Local government can immediately realize the semi-primitive of mangrove area (Langpanggang and Suwa'an) as conservation area which there are tourist activities (ecotourism).

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