

The dynamic changes of Barito basin peat land ecosystem in South Borneo, Indonesia

Yunandar^{1,2}, Hefni Effendi³, Widiatmaka⁴, Yudi Setiawan^{3,5}

¹Study Program of Natural Resources and Environment Management, Graduate School, Bogor Agricultural University, Baranangsiang Campus Bogor 16144, Indonesia,

²Department of Aquatic Resource Management, Faculty of Fishery, Lambung Mangkurat University, Banjarmasin 70123, Indonesia,

³Center for Environmental Research, Bogor Agricultural University, Dramaga Campus, Bogor 16680, Indonesia,

⁴Department of Soil Sciences and Land Resources, Faculty of Agriculture, Bogor Agricultural University, Dramaga Campus, Bogor 16680, Indonesia,

⁵Department of Forest Resources Conservation and Ecotourism, Faculty of Forestry, Bogor Agricultural University, Dramaga Campus, Bogor 16680, Indonesia

E-mail: nandarco@yahoo.com

Abstract. The dynamic changes of aquatic ecosystem have an important role in order to maintain the sustainability of peat land ecosystem. The aquatic ecosystem is the main supply of freshwater in the Barito basin region, contribute to the water quality for consumption and production, habitat for aquaculture. Therefore, the spatial modelling of inundation changes is a pre-requisite for future peat land management. This study employed GIS and Remote Sensing techniques to monitored land cover/land use changes for observed inundation in Barito basin, South Borneo, Indonesia using multispectral satellite data obtained from Landsat at 1994, 1996, 2013 and 2015 respectively. The Barito peat basin areas, based on object dominance, were classified into five cover classes/dry land use compilation namely swamp bushes, open areas, transportation, galam vegetation (*Melaleuca sp*) and water bodies. The truth value was 88.48% for *Overall Accuracy* and 0.8 for Kappa which belonged to the substantial category. Land cover/land use resulting from spatial analysis showed a significant increase in water bodies totally 24% from 14% in 1994. Inundations that were close to the Barito river flow had a typical permanent compared to those that were far from the river. Regarding inundations throughout the season contributed to the management and development of the socio-economic area.

1. Introduction

Peat land was an aquatic ecosystem that was unique from the ecological and economic context simultaneously both locally and globally. The use of peat land as a tangible ecosystem service had resulted in economic growth of the community as providers of fresh water [1], biological resources, food, recreation, and purification [2,3,4]. Furthermore, the intangible sector was as a retarding basin, global soil carbon storage, and bio-geochemical mechanisms in the environment [5,6].

South Kalimantan with an area of 38,744 km², had the largest peat land potential of around 35,548.4 hectares located in North Hulu Sungai Regency [7]. This ecosystem was part of the retarding basin of

