

**ESTIMATION OF THE CORRELATION BETWEEN CARBON STOCK  
VALUE AND VEGETATION INDEX MULTIVARIABLE FROM ALOS  
AVNIR-2 SATELLITE IMAGING  
(CASE STUDY: MERUBETIRI NATIONAL PARK,  
EAST JAVA, INDONESIA)**

**I. Fardani<sup>1\*</sup>, S. Darmawan, D<sup>2</sup>. M. Hakim<sup>1</sup>, A. Budi Harto<sup>1</sup>, K. Wikantika<sup>1,2</sup>**

<sup>1</sup>Geodetic and Geomatic Engineering, Faculty of Earth Sciences and Technology, Institut Teknologi Bandung (ITB)

<sup>2</sup>Center For Remote Sensing ITB, Remote Sensing and GIS Research Division

Labtek-9c floor 2, Ganesha Road No 10, Bandung, West Java, Indonesia

Tel: + 62 (0) – 22 – 2530701 ; Fax: + 62 (0) – 222530702

Email: Irland\_Fardani@yahoo.com

**Key words:** Carbon Storage, Multivariable, Vegetation Index, ALOS AVNIR

**Abstract:** Forests play an important role in absorbing CO<sub>2</sub> from the atmosphere and keeping it in its ecosystem. It's been concluded that 80% carbons (C) are stored by the forests and about 40% are found in soils. Land conversions, deforestations, forest degradation, and reforestation would alter the type of soil covering and therefore would cause the biomass and underground carbon composition to change. For that reason, it is important to quantify precisely every biomass composition from varied vegetation in the forests to determine the exact carbon absorption capacity.

In this study, the vegetation index approach was done to estimate the stored carbon using ALOS AVNIR 2 Satellite Image in the region of National Park Merubetiri, East Java, Indonesia. The images used were recorded at 10 June 2009 and the data of stored carbon were measured from May 2010 until January 2011. Carbon storage was calculated using 2 multi variable equation which was linear equation and exponential equation. Linear equation gives  $Y = 41.0621 - (199.068 \times \text{MSAVI}) + (197.383 \times \text{NDVI}) - (2.43022 \times \text{RVI})$  with correlation value of 0.63 and carbon estimation value of 3.591.321 tons, while exponential equation gives  $Y = 0.069 \times (e^{(-235.894 \times \text{IPVI})} + e^{(3.439 \times \text{MSAVI})})$  with correlation value of 0.32 and estimation value of 3.921.323 tons.

This study showed that combining several vegetation index variables (multivariable) compared with estimation using one vegetation index variable would give a significant difference in their correlation value. The correlation value resulted from multivariable estimation increases instead of estimation using single variable vegetation index.