

ESTIMATION OF CARBON IN MANGROVE STANDS BIOMASS AT BAGEK KEMBAR REHABILITATION MANGROVE ECOTOURISM SEKOTONG WEST LOMBOK

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ABSTRACT

The Bagek Kembar mangrove ecotourism area, Sekotong, West Lombok has been designated as one of the mangrove essential ecosystem area in West Nusa Tenggara. One of the ecological services of a mangrove ecosystem is a carbon storage. Mangrove forest have the ability to store carbon 4 times higher than the world's tropical rainforest. This study aims to assess the amount of carbon stored in mangrove stands in the Bagek Kembar mangrove ecotourism area, Sekotong West Lombok. This study uses a random sampling method, which is the placement of random plots in each mangrove zoning. The mangrove zoning is divided based on the distance from the sea and the river starting from 50 meters, 100 meters, 150 meters, 200 meters, 250 meters, and 300 meters. In addition, the mangrove area was divided into two mangrove statuses namely natural mangrove succession and rehabilitation and 10% of the 5x5 meter observation plot sample was taken. So that there were 286 observation plots obtained. Calculation of mangrove biomass using allometric equations. The results of the estimation study of carbon deposits on mangrove stand biomass in the Bagek Kembar Mangrove Ecotourism area of a total 6 zoning amounted to 64430.96 (kg/m²)

Keyword : Carbon, Biomass, Mangrove Bagek Kembar

INTRODUCTION



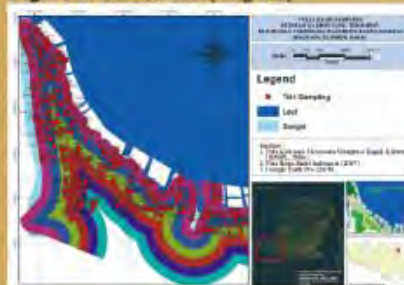
METHODS

The study used a random sampling method, where the entire Bagek Kembar Mangrove Area was divided into 6 zonations based on the distance from the coast and river starting from 50m, 100m, 150m, 200m, 250m and 300m distances. Then the sample was taken randomly, as much as 10% of the area using a 10x10m square plot for trees, 5x5m for poles and 2x2m for seedlings.

Figure 1. Sampling



Figure 2. Carbon Sampling Map



RESULTS

Mangrove species found in the rehabilitation area of the Bagek Kembar Mangrove Ecotourism are as 6 species namely *Avicennia marina*, *Avicennia alba*, *Rhizophora mucronata*, *Rhizophora stylosa*, *Rhizophora apiculata* and *Lumnitzera racemosa*. Based on the results of the study found the density of mangrove species as in Table 2 below:

Table 2. Density Individual of Ecotourism Mangrove Rehabilitation Bagek Kembar

No	Code Zone	Species Mangrove	Type Growth	Density (ind/m ²)
1	Zone 1	<i>Avicennia marina</i> <i>Rhizophora mucronata</i> <i>Rhizophora apiculata</i> <i>Rhizophora stylosa</i>	Pancang	21.60
2	Zone 2	<i>Avicennia marina</i> <i>Rhizophora stylosa</i> <i>Lumnitzera racemosa</i>	Pancang	6.00
3	Zone 3	<i>Avicennia marina</i> <i>Avicennia alba</i> <i>Rhizophora stylosa</i> <i>Lumnitzera racemosa</i>	Pancang	3.79
4	Zone 4	<i>Avicennia marina</i> <i>Avicennia alba</i> <i>Rhizophora stylosa</i>	Pancang dan Semai	3.32
5	Zone 5	<i>Avicennia marina</i> <i>Rhizophora stylosa</i>	Semai	0.26
6	Zone 6	<i>Lumnitzera racemosa</i>	Pohon	0.12

Table 3. Estimation Results Carbon Uptake Ecotourism Mangrove Rehabilitation Bagek Kembar

No.	Code Zone	Biomass	Carbon Stock (kg/m ²)
1	Zone 1	303.2446	139.4925
2	Zone 2	2520.821	1159.577
3	Zone 3	303.4271	139.5765
4	Zone 4	30.42172	13.99399
4	Zone 5	72.74791	33.46404
6	Zone 6	136836.6	62944.85
		303,2446	64430.96

Table 1. Allometric equation some species of mangrove

Species of Mangrove	Allometric equation	Source
Family Rhizophoraceae <i>Rhizophora apiculata</i>	$W_{tot} = 0.235DBH^{1.47}$ $W_{st} = 0.00898DBH^{2.31}$ $W_{rt} = 0.128DBH^{2.07}$ $W_r = 0.00974(D^2H)^{1.12}$ $H = D/(0.02D+0.676)$	(Ong, et al. 2004)
<i>Rhizophora spp.</i>	$W_{tot} = 0.128DBH^{2.07}$ $W_{st} = 0.128DBH^{2.07}$ $W_r = 0.261DBH^{1.98}$	(Fromard et al. 1998) (Tamai et al. 1986)
<i>Rhizophora stylosa</i>	$W_{tot} = 0.128DBH^{2.07}$ $W_r = 0.261DBH^{1.98}$	(Comley and McGuinness. 2005)
Family Acanthaceae <i>Avicennia marina</i>	$W_{tot} = 0.308DBH^{2.11}$ $W_{st} = 1.26DBH^{1.77}$	(Comley and McGuinness. 2005)
Common equation	$W_{tot} = 0.251DBH^{2.09}$ $W_{st} = 0.199p^{1.888}D^{2.20}$	(Komiya, et al. 2008)

The carbon stock stored in mangrove forests is obtained from the total amount of mangrove biomass found in the area which is then multiplied by the carbon concentration (C) contained in the plant which is around 46%. To get the total carbon stock value can be calculated by multiplying the total biomass by concentration C, as follows (Hairiah, et al., 2007)

$$\text{Absorption of stock carbon} = \text{total biomass} \times 0.46$$

CONCLUSION

Mangrove ecosystem at Bagek Kembar Ecotourism Area which consists of 6 species of mangrove namely *Avicennia marina*, *Avicennia alba*, *Rhizophora mucronata*, *Rhizophora stylosa*, *Rhizophora apiculata* and *Lumnitzera racemosa*. Carbon storage in each zone has a different value. This difference is due to differences in growth rates and types of mangroves. The total carbon stored in the Bagek Kembar Ecotourism Area is 64430.96kg / m².

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