Title: Soil Carbon Sequestration of Mangrove forest in Sarawak, Malaysia

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Abstract

Soils play an important role of life and ecosystem as medium of plant growth, nutrient supplies, agriculture activities, and as well as carbon storage. There is a growing concern of increasing level of carbon dioxide in the atmosphere due to deforestation activities, fossil fuel burning, land usage and many others causes. This study will revealed the potential of mangrove soil as soil carbon sequestration where is the process transferring the excessive carbon dioxide in the atmosphere into soil through dead crop, plant residues and other organic solids. The study was conducted at Wildlife Sanctuary Sibuti, Miri (WSSM) and Awat-Awat Lawas, Limbang (AALL) a region of Sarawak. Forty soil samples were collected in depth from 0 ï 30 cm within 0.5 hectare plot size. Soil sampling was conducted on December 2009 and Jun 2010 respectively to study the location effect and seasonal variation. Soil carbon was analyzed using loss in ignition method and other variables were determined are soil pH in water and KCl, soil organic matter, total nitrogen and total phosphorous. There were significant effects on soil carbon between two locations for both sampling and seasonal variation of AALL. Soil carbon at WSSM is insignificant due to seasonal vegetation. The soil in both mangrove forest is acidic in pH range from; (i) WSSM: 2.67 to 4.90 (in water) and 2.51 to 4.44 in pH (in KCl), and (ii) AALL: 2.44 to 3.73 (in water) and 2.40 to 3.68 (in KCl). Comparison between WSSM and AALL found significant differences of soil pH in water and in KCl, soil organic matter, total nitrogen and total phosphorous for first and second sampling. The soil at WSSM is more acidic than AALL and have high amount of soil organic matter, total nitrogen and total phosphorous. Significant result and amount of soil carbon found at both study areas and seasonal variation concluded that the mangrove soil have potential as carbon sequestration however the ability depends to the rate of decomposition, plant residue, and organic compounds.

Keywords: mangrove soil, soil carbon sequestration, organic matter, total nitrogen, total phosphorous.