

## **Inventory of Soil Carbon Loss from Soil Erosion of Thailand**

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### **Abstract**

Thai soil erosion and soil carbon loss inventory is carried out in Thailand. Using mathematical model identifies soil carbon loss that delineates from slightly to severely of carbon losses from soil. Soil carbon losses consist of three major groups such as soil respiration from microorganisms as heterotrophic soil microorganism that uses soil carbon as substrate. Secondly, anthropogenic and natural fire occurs in agricultural land areas. The last one, soil erosion is a main loss of soil carbon losses. Not only mathematical model but also monitor soil carbon takes soil and plant samples during 2010-2012 and mass balance theory involve and summarized as follow. Moreover, The T-Test for comparing means that is C, H, O, N, S in soils and plants samplings and soil respiration is concerned to compare in six regions.

The results show that Thai agricultural litters have gotten 255.27 million ton/year or 93.48 million ton carbon/year (100% C/year). Total land areas of Thailand are 513,115 km<sup>2</sup> and 62% (318,131 km<sup>2</sup>) are agricultural land areas. Land development department plans to reduce global warming impact from CO<sub>2</sub> emission. Carbon sequestration as carbon storage into the soil is interesting. 30 Plant types are collected and analyzed by Elemental Analyzer. The plant carbon content is 6.63 - 53.37 %C. Thailand is 513,115 km<sup>2</sup> of total land areas. The agricultural land areas are 318,131 km<sup>2</sup> (62% of total land areas). There are 666.99-766.95 million ton carbon/year from soil surface. Soil respiration emits CO<sub>2</sub> 6.89-8.05 ton carbon/year or equal to 1.88-2.20 ton carbon/year. Secondly, anthropogenic and natural fire emits 3.67 – 7.33 million ton CO<sub>2</sub> /year or 1 – 2 million ton carbon/year. Finally, soil erosion of Thailand is the highest losses from soil surface at least 111.07 – 13.20 million ton carbon/year. 86% of total organic litter (Total C 93.48 million ton carbon/year= 100%) is used for Bio-energy, particle material in construction, animal feed stock and compost for agriculture. 14% of total carbon is fulfilled in to the soil to store carbon flux or carbon storage. At least 11.07-13.20 ± 2.13 million ton carbon/year is a figure to equilibrium or mass balance in soil of Thailand.

**Keywords:** Carbon Pool, Carbon Losses, Carbon Storage or Sequestration, Carbon Dynamic, Soil Erosion