



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.

Thesis Title: Occurrence, distribution, resilience of soil organic carbon and its dependence on natural and anthropogenic factors

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**SHORT ABSTRACT**

Climate change due to global warming is the major concern of the 21st century. There is no single technology that will be able to address climate change but a sum of many initiatives may be one of the effective ways to address climate change. Soil represents one of the largest pool of carbon in the biosphere, and there is a potential to use soil as a sink to sequester carbon, which can be one of the initiatives in mitigation of climate change. In this work, we developed an integrated process based framework using field measurement and modeling to evaluate soil carbon dynamics in Northeast India. The study developed a predictive model for finding a relationship between known soil carbon values and environmental variables so that soil carbon can be map digitally. This enables us to identify the potential regions for soil carbon storage as well as in evaluating the most influencing factors in the determination of carbon storage. Knowing the factors that influence the soil carbon storage, the study evaluates the effect of various anthropogenic activities Viz. land use conversion and land management on carbon fluxes as well as on overall soil quality. An integrated tool in the form of soil quality index was developed to enable monitoring the effect of various land management on soil carbon and soil quality as a whole. On-farm experiment was also conducted to evaluate the effect of land management on SOC and soil properties The study also evaluates the effect of natural factors (climatic variables) in controlling the amount of soil carbon and made an attempt to understand how likely changes in climatic variables will have an impact on soil carbon.