IDENTIFICATION OF VULNERABLE SITES FOR THE ADOPTION OF ORGANIC FARMING USING GEO-SPATIAL TECHNOLOGIES IN BANGLADESH

Md. Jashim Uddin*[1], ASM Mohiuddin[1] and Shaikh Tanveer Hossain[2]
[1]Department of Soil, Water and Environment, University of Dhaka, Bangladesh
[2]Asian Productivity Organization (APO), Japan
*E-mail: mjuddin66@yahoo.com

ABSTRACT

The average soil organic carbon content of topsoil's (high land and medium highland sites) have gone down from about 2 % to 1 % over the last 20 years in Bangladesh due to intensive cultivation and improper land and fertilizer management. Identification of vulnerable sites such as highland (HL) and medium highland (MHL) units are very much important for organic farming adoptation. HL is categorized which is above normal inundation level and normally would not develop wetland conditions unless rainwater is ponded. On the other hand, MHL has defined the lands which are typically is flooded up to about 90 cm deep during the flood season. Geo-spatial technology is instrumental in understanding the soil fertility level, consists of geographical information

systems (GIS), remote sensing (RS) and global positioning systems (GPS) which helps for promoting the site-specific soil and crop management.

A study was undertaken to evaluate the distribution and spatial variability, in the levels of soil organic carbon (SOC) using geo-spatial technologies in two major alluviums of Bangladesh. The two alluviums—the Brahmaputra and the Ganges—were selected considering its large area with a wide diversity of agro-ecosystems in Bangladesh. SOC levels were studied across the four sites covering 268 grid locations. Among four sites, Delduar sub-district under Tangail district, and Melandah sub-district under Jamalpur districts cover the Brahmaputra alluvium. On the other hand, Mirpur sub-district of Kushtia district, and Fultala sub-district under Khulna district covers the Ganges alluvium. Soil samplings were done at a one-minute interval (1600m) in 0-30 cm depths. GPS was used to identify the sampling locations. Sampled soils were analyzed in the chemical laboratory and measured soil organic carbon by wet oxidation method. The SOC datasets were interpolated in krig and inverse distance weighted (IDW) using ARC/GIS version 9.3.

SOC datasets interpolated were found from 0.40 to 0.88 % in the Delduar site, 0.40 to 0.63% in the Melandah site, 0.38 to 0.58 % in the Mirpur site, and 0.39 to 0.93 % in the Fultala site. The above spatial interpolation showed that the investigated SOC in the HL and MHL sites were very low. The reasons for low SOC may be due to their lower inundation level, e.g., land levels concerning

flooding depths, and together with the higher intensity of use. Since SOC is required more than 2% in good agricultural soil, so such low SOC in this vulnerable soil is very much alarming and needed to be improved. It is emergence to initiate organic farming for enhancing the vulnerable soils in Bangladesh or similar climatic conditions in other regions to restore soil health.

Keywords: Soil organic carbon depletion, Adoption of organic farming, Geo-spatial technologies, Precision agriculture

Theme: Others (organic farming and Geo-special technologies)

Biography of Md. Jashim Uddin

Full name:	Md. Jashim Uddin
Position:	Associate Professor Department of Soil, Water and Environment University of Dhaka.
Country:	Bangladesh
Biography:	Dr. Md. Jashim Uddin is an Associate Professor of Department of Soil, Water and Environment in University of Dhaka, Bangladesh. He earned PhD from the Kingston University London, United Kingdom. Earlier Dr. Uddin worked in Soil Resource Development Institute and Bangladesh Rice Research Institute and published around 40 research papers.
SNS accounts:	Facebook: Jashim.Uddin3910829
Name for the Certificate of Attendance:	Dr. Md. Jashim Uddin