C-MASC Scholar Viewpoint

FROM THE DESK OF KARABI PATHAK, THE FULBRIGHTER

Soil erosion occurs naturally under all climatic conditions and on all continents. However, it is significantly increased and accelerated by unsustainable human activities through intensive agriculture, deforestation, overgrazing, and improper land-use changes. Soil erosion rates are much higher than soil formation rates, meaning its loss and degradation is not recoverable within a human lifespan. Land-use conversion from native forests to agricultural land has aggravated the degradation process by degrading soil structure and accelerating erosion. Reducing the magnitude and intensity of soil physical disturbance in agricultural soils through appropriate management options may deaccelerate the soil degradation process. Soil is the elixir of life. It is the provider of food, moderator of climate, filter and reservoir of renewable water, habitat for germplasm, the inspiration for aesthetic and spiritual activities, source of pharmaceuticals and other materials, achieve of planetary and human history as mentioned by Prof. Rattan Lal, the 2020 World Food Prize Laureate and former President, International Union of Soil Science. Soil is the nature-based solution that addresses the challenges of the 21st century; the challenges include world food security, climate crisis, and sustainable livelihood development.

My studies at C-MASC, The Ohio State University, Columbus aims developing soil saving techniques. During my stay, I enjoyed visiting the world's oldest no-till farm plot that had been established at the Wester Agricultural Research Station, South Charleston, Ohio, for soil sampling for my post-doctoral research work. I studied the long-term tillage practices in soil erosion and soil organic carbon management. Three sites of different land use types/tillage practices, i) no-till corn (*Zea may*s L.), ii) plow till corn, and iii) native forest, were selected at the Western Agricultural Research Station, South Charleston, Ohio, USA. This study's objective was to assess the impact of NT farming on water infiltration, soil loss, and soil organic carbon and total nitrogen contents. My study suggests long-term land management of PT agricultural land under no-tillage improves soil organic carbon, total nitrogen, soil hydraulic conductivity, and water infiltration capacity than that under PT. I extensively performed the rainfall simulation to measure soil erosion and associated carbon loss from soil.

Apart from my research journey to Columbus, visiting great cities including Washington DC, New York, Chicago gave me a sense of America's multiculturalism, diversity and the cherished values of democracy and freedom. Coming from India, a country with diverse cultures, I was able to appreciate the shared values and aspirations of the two nations for the betterment of humankind.

My C-MASC experience was very productive; it enriched my scientific temperament and knowledge, which I am keen to apply for research in India. In that context, I would like to pay my gratitude and thanks to Dr. Lal and C-MASC, The Ohio State University, Columbus. for the support during my stay.

I remain thankful to the US-India Education Foundation (Fulbright Commission), Government of India and US Department of States for showing confidence in me and giving me this splendid opportunity to drive the cutting-edge research Under Fulbright-Kalam Climate Program.

Sincerely,

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