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Evaluation of wetlands as carbon sinks towards its contribution in offsetting GHG emission and climate change

The earth is getting warmer consistently over the last few decades. The World Meteorological Organization's (WMO) 'State of Climate' report stated that the global mean near surface temperature (GMNST) was 1.45°C higher than the pre-industrial period (1850-1900) average recording it the warmest year in the 174 year history. Again according to WMO the year 2024 could be the warmest year with GMNST higher than in 2023. To cope with global warming and the climate change, different countries have set NDCs (Nationally determined contributions) as Climate Action Plans to reduce overall GHG emission intensity. Wetlands are the distinct and dynamic ecosystems having vast biodiversity and provide numerous ecological services. One of the unique features of wetlands is that they act as carbon (C) sink because of high biological productivity. But, there is a shortfall of data on the C content, its storage and sequestration in different wetlands across the country. We have attempted to estimate C accumulation in soils of different wetlands and its sequential potential vis-à-vis the reference upland sites and also the contributions of different sources that facilitate the C capture and its subsequent storage. The wetlands varied in stocking C from 12.65 to 166 Mg/ha upto 0.3m depth into the soil depending on the types and many other factors. The accumulation of C in wetland soils was 1.2 to 4.8 times higher than the reference uplands. Assuming a conservative estimate of C sequestration at 1 Mg C/ha/y in floodplain wetlands in the country, an amount of C equivalent to 2.01 million Mg CO₂ is sequestered and stored in wetland soils. So wetland conservation, restoration and proper management can be effective climate action strategy.

Keywords: Wetlands, Floodplains, GHG emission, Climate change, Carbon sequestration, Primary production

Biography

Dr. Subir Kumar Nag is a graduate in Agriculture and Post-Graduate in Agricultural Chemistry & Soil Science. He is Ph. D. in Agricultural Chemicals from ICAR-IARI, New Delhi. Dr. Nag has more than 29 years experience in working as ARS Scientist under the ICAR. His research areas include monitoring and risk assessment of xenobiotics, ecotoxicology, carbon sequestration and GHG emission from wetlands etc. Dr. Nag has authored more than 80 research papers, edited book, several book chapters, other publications. He is a Pos-Doc from Australia and recipient of many fellowships, awards and recognitions. Dr. Nag has guided three Ph.D. students.