|  |  |  |  |
| --- | --- | --- | --- |
| Title | Soil Organic Carbon Pool and its Storage in Arial Beel Wetland Soils of Bangladesh | | |
| Author(s) Name | Md. Faruque Hossain, ASM Maksud Kamal, Monera Akhter Eva, S Mosaddeq Ahmed and Zakia Parveen | | |
| Contact Email(s) | mfhossain@aiub.edu ; hossainfaruque@hotmail.com | | |
| Published Journal Name | American Journal of Environmental Sciences | | |
| Type of Publication | Journal | | |
| Volume | 16 | Issue | 03 |
| Publisher | Science Publications | | |
| Publication Date | 17 August, 2020 | | |
| ISSN | 1553-345X | | |
| DOI | https://doi.org/10.3844/ajessp.2020.55.67 | | |
| URL | https://thescipub.com/abstract/10.3844/ajessp.2020.55.67 | | |
| Other Related Info. | Pages 55-67 | | |
| **Keywords:** Wetland, Arial Beel, Soil Organic Carbon Stocks, Climate Change Policy, Greenhouse Gas Emission, Bangladesh | | | |
| Citation: Hossain, M. F., Kamal, A. M., Eva, M. A., Ahmed, S. M. & Parveen, Z. (2020). Soil Organic Carbon Pool and its Storage in Arial Beel Wetland Soils of Bangladesh. American Journal of Environmental Sciences, 16(3), 55-67. https://doi.org/10.3844/ajessp.2020.55.67 | | | |

|  |  |
| --- | --- |
| Abstract |  |
| The actual quantity of Soil Organic Carbon (SOC) stored in wetlands can only be estimated within a broad range of uncertainty. An accurate assessment of the size and distribution of the SOC storages in wetland resources is very difficult to obtain, therefore, the proposed research objective is to measure SOC storage and its pool on wetland soils of Arial beel in Bangladesh. Initial results of Arial beel soil profiles indicates SOC concentrations are high in surface soils ranges from 1.67 to 1.95% but its concentrations are decreasing with depth whereas SOC stock in kg C m-2 is increased with depth due to increase soil bulk density with depth. However, carbon in deeper layers may be more stable than that in surface soils due to difference in source, composition and environmental conditions. Soil organic C stored in the three different locations of wetlands soils to 1 m depth such as 16.47, 18.27 and 17.22 kg C m-2, respectively with an average of 17.32 kg C m-2. On the other hand, SOC stored in upland soils to 1m depth such as 11.24 kg C m-2, significantly less than the wetland soils, which indicates that wetland soils serve as a major source of SOC. However, this SOC act as a conditioner to enhance fertility status while combating with climatic extremes, not only that it is a vital component of soil with important effects on the functioning of terrestrial ecosystems. For SOC pool, different extraction methods are used such as, highly labile fraction of SOC extracted with hot water (about 3-8% of total SOC), water soluble fraction of SOC extracted with water (about 1% of total SOC), labile fraction is extracted using CaCl2 (about 1% of total SOC), moderately labile fraction extracted by pyrophosphate (about 4-10% of total SOC), polyaromatic SOC is extracted using toluene + methanol (trace amount of total SOC), microbial biomass C extracted by K2SO4 (about 2-5%) and the resistant fraction remaining after extraction. However, the SOC concentration is high in surface layer but with depth concentration decreases. In addition, soil bulk density and thickness values increase with depth, as a result deeper layers stored more carbon than surface layer in Arial beel soils. There is increasing evidence from the results that wetlands have an important and under-estimated role in carbon storage and its pool the regulation of greenhouse gas emission. Some types of wetlands play a particularly key role as C stores, these include forested wetlands and vegetated inter-tidal wetlands and hence, Sundarban mangrove forest and Tengarchar SOC stocks and pools measurement are an urgent issue for the Climate Change researchers and policy makers. | |

**Please specify which Sustainable Development Goal (SDG) (s) falls under your research:**

|  |  |  |  |
| --- | --- | --- | --- |
| Goal 1 | No Poverty | Goal 2 | Zero Hunger |
| **Goal 3** | **Good Health and Well-Being** | Goal 4 | Quality Education |
| Goal 5 | Gender Equality | Goal 6 | Clean Water and Sanitation |
| Goal 7 | Affordable and Clean Energy | Goal 8 | Decent Work and Economic Growth |
| Goal 9 | Industry, Innovation and Infrastructure | Goal 10 | Reduced Inequalities |
| Goal 11 | Sustainable Cities and Communities | Goal 12 | Responsible Consumption and Production |
| Goal 13 | Climate Action | Goal 14 | Life below Water |
| Goal 15 | Life on Land | Goal 16 | Peace, Justice and Strong Institutions |
| Goal 17 | Partnerships for the Goals |  |  |