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Why should we preserve wetlands?

Wetlands are transitional zones between terrestrial and aquatic systems, and remain inundated or saturated due to high groundwater or surface water during a part or all through the year[1]. Wetlands in different parts of the world have been used for agriculture because of their natural fertility and water availability[2]. Livelihood, food security, income and nutrition of the people living in and around the wetlands in Asia and Africa are strongly affected by their management. Wetlands are amongst the most environmentally sustainable systems, but produce low yield due to traditional systems of management[3]. Therefore, prudential intensification of wetland agriculture in the absence of holistic approach has disintegrated wetland ecosystem services along with adverse impacts on environment quality[4]. Moreover, indiscriminate and intensive use of wetlands, without considering the preservation of ecological integrity has converted a large pedologic soil organic carbon (SOC) sink into a net source[5]. Therefore, it is important to document the SOC pool of wetlands under changing climate, because carbon management in any terrestrial pool is one of the priority actions of national and international policy goals. Keeping this in view, the present study was undertaken in the Chatla wetland (90°45′N and 24°45′E) of Barak Valley, North East India, with an objective to explore its standing organic carbon stock. Chatla is the catchment of River Ghagra, the tributary of River Barak. The topography of the area is low-lying with numerous small hillocks in between that are inhabited by the villagers. The geographical area of Chatla is ~10 km^2 (ref. 6). The major ethnic group is the ‘Kaivartas’, a fisher community. Paddy cultivation is the primary farming system. To achieve the desired goal of estimating SOC stock of Chatla wetland, soil samples were collected from three principal eco-zones of wetlands, viz. (i) littoral (interface between land and water basin), (ii) sub-littoral (shallow water zone) and (iii) deep water zone during the winter season (January 2014). However, during winter months deep water zone was inundated. Therefore, for this zone, square-sized mudden boundary was prepared to remove the water. After drying, soil samples were collected up to a depth of 1 m from three strata, viz. 0–10, 10–30 and 30–100 cm. Three pits were dug in each zone to collect soil samples and average of the three zones was used as the representative SOC value for the wetland. The SOC concentration was determined by Walkley and Black’s rapid titration method[7]. The SOC stock (Mg ha^{-1}) of each eco-zone was computed following the method of Blanco-Canqui and Lal[8]. The study revealed that the magnitude of SOC stock was in the order deep water > sub-littoral > littoral zone (Figure 1). Higher SOC stock in deep water can be attributed to permanent high water table, which slows down organic matter decomposition and allows accumulation of more organic carbon[9]. In the case of littoral and sub-littoral zones, they shrink as they dry and swell as they become moist, creating deep and wide cracks that potentially enhance organic matter oxidation, leading to loss of SOC from such eco-zones[10]. Total SOC stock of the wetland was 220 Mg ha^{-1}, which is higher than any tropical land uses (Table 1)[11–17]. Hence, preserving wetlands is important, so that the carbon stored is not released to the atmosphere. However, such a large SOC pool has been disintegrated through intensification of agricultural practices. It has been estimated that ~70% of total global wetland area and almost similar amount of SOC have been lost since the industrial

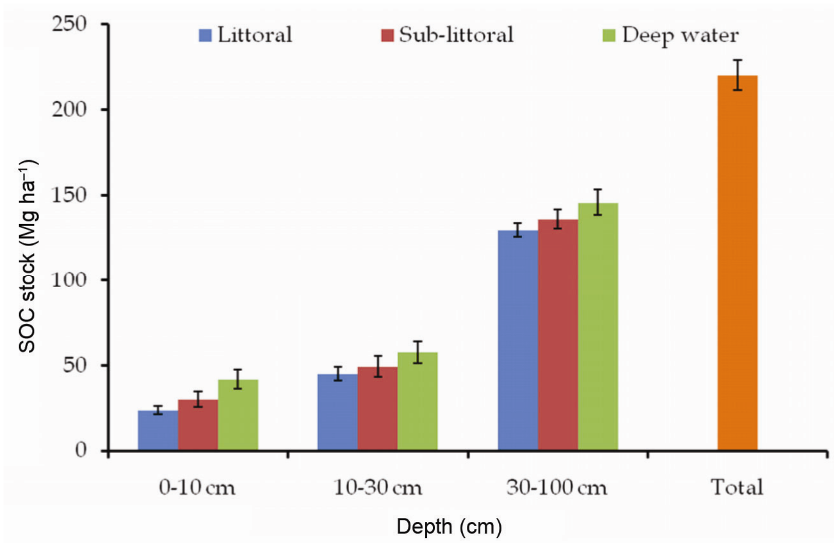

Figure 1. Soil organic carbon (SOC) stocks of different eco-zones of the Chatla wetland, Barak Valley, North East India. Line on each bar represents standard error of the mean. Bar on total represents the standard error of mean calculated from SOC stocks (0–100 cm) of littoral, sub-littoral and deep water zones.

Table 1. Soil organic carbon (SOC) stock (up to 1 m soil depth) of different tropical landuses

Ecosystem	Region	SOC (Mg ha^{-1})	Reference
Dipterocarpus forests	North East India	141.13	11
Rubber *(Hevea brasiliensis)* plantations	China	154.9	12
Cacao + *Gliricidia* (*Gliricidia sepium*)-based agroforestry	Indonesia	155	13
Cacao *(Cocao cabruca)*	Brazil	192.6	14
Natural forests	Kerala	176.6	15
Rice (*Oryza sativa*) – paddy		55.6	
Coconut (*Cocos nucifera*)		91.7	
Small home gardens		119.3	
Natural forests	Brazil	137.3	14
Herbs and grass-dominated natural forests	Bangladesh	168.15	16
Agricultural lands	Thailand	136.34	17
Wetlands	North East India	220.25	Present study

revolution due to human activities such as conversion of wetlands to farmlands, forestry and urban areas[18]. Therefore, SOC stored in wetlands is not well protected; rather, their mismanagement has turned such large SOC sinks into a net source[5] and further exacerbated ecosystem dis-services. To halt further degradation of such SOC-rich systems, preservation and restoration of wetlands is important for enhancing terrestrial carbon sinks. Moreover, wetland agroforestry can be promoted that can alleviate poverty by making substantial contribution towards local economy[19]. Furthermore, drainage and deforestation that result from farmland expansions must be prohibited. Restoration of wetlands can be promoted by providing incentives to the land managers through payment of ecosystem services.

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A new occurrence of tapiolite from Kuberpur pegmatite, Surajpur district, Chhattisgarh, India

Survey and exploration for atomic minerals have been carried out in the past couple of decades by the Atomic Minerals Directorate for Exploration and Research (AMD) in parts of migmatitic terrain of erstwhile Sarguja district, Chhattisgarh and Sonbhadra district, Uttar Pradesh (UP), India. This has resulted in identification of several atomic mineral occurrences. The geological terrain of Sarguja has been studied earlier. Discovery of atomic minerals commenced with the identification of beryl and columbite–tantalite in pegmatites in the early 1960s (Tatachar and Sheshadri, unpublished; ref. 1). Subsequently, detailed work in the area resulted in the identification of many more such beryl and