



CARBON SEQUESTRATION IN ESTUARINE MANGROVE SOIL

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Introduction

- Soil is a thin layer of earth's crust which serves as a natural medium for the growth of plants.
- Soil carbon sequestration is the removal of CO₂ from the atmosphere through plant photosynthesis, and storage as long-lived, stable forms of soil organic matter that is not rapidly decomposed.
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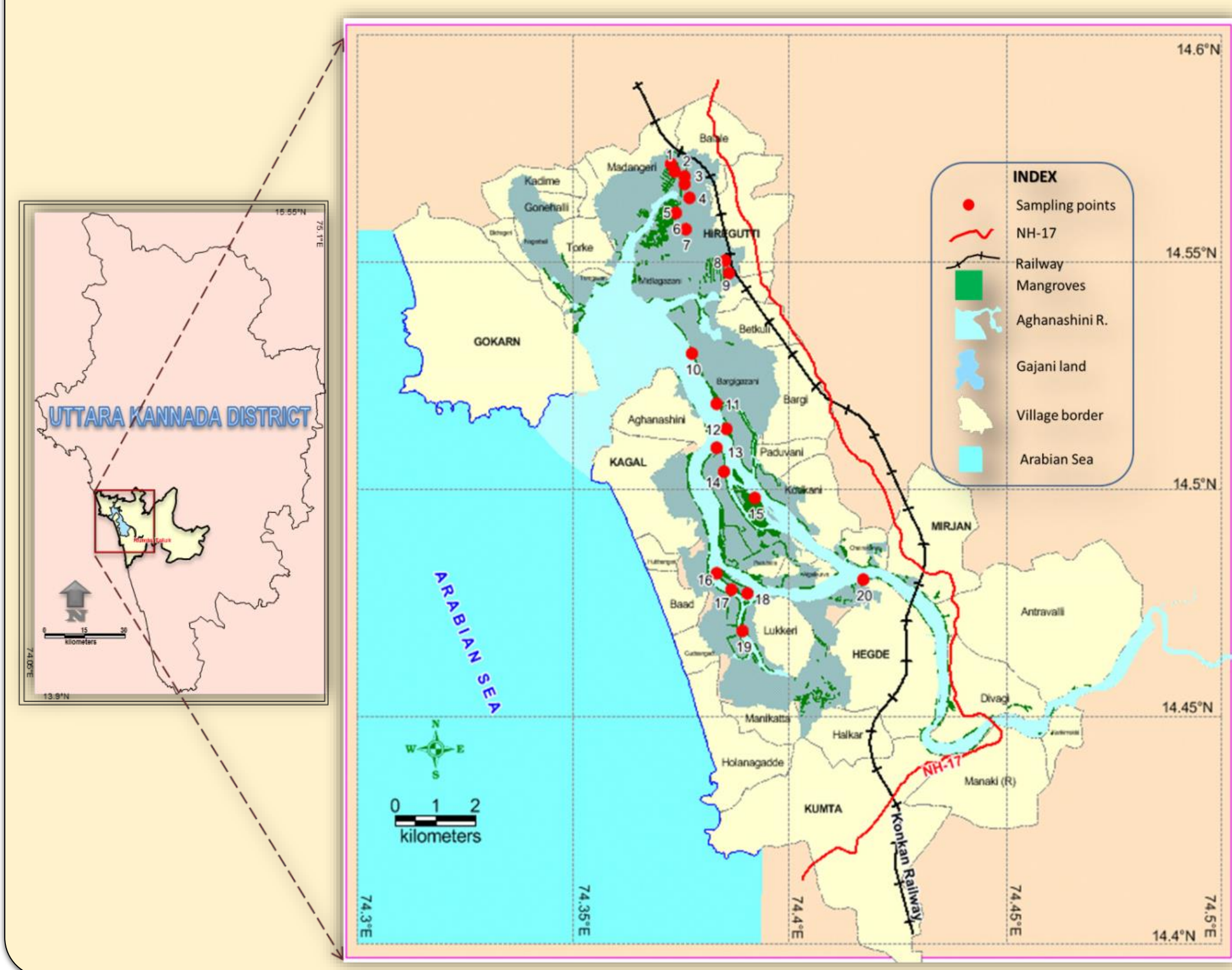
Mangrove

- Mangroves are salt tolerant plants growing in the swampy mud of coastal areas.
- They grow in intertidal zones of river mouths, lagoons and creeks where fresh water mixes with sea water.
- Mangroves render many good services like protection from tsunami and cyclones, nutrient cycling, sediment trapping, provide habitat for numerous organisms, wood for lumber and fuel, honey, fodder, medicine etc.

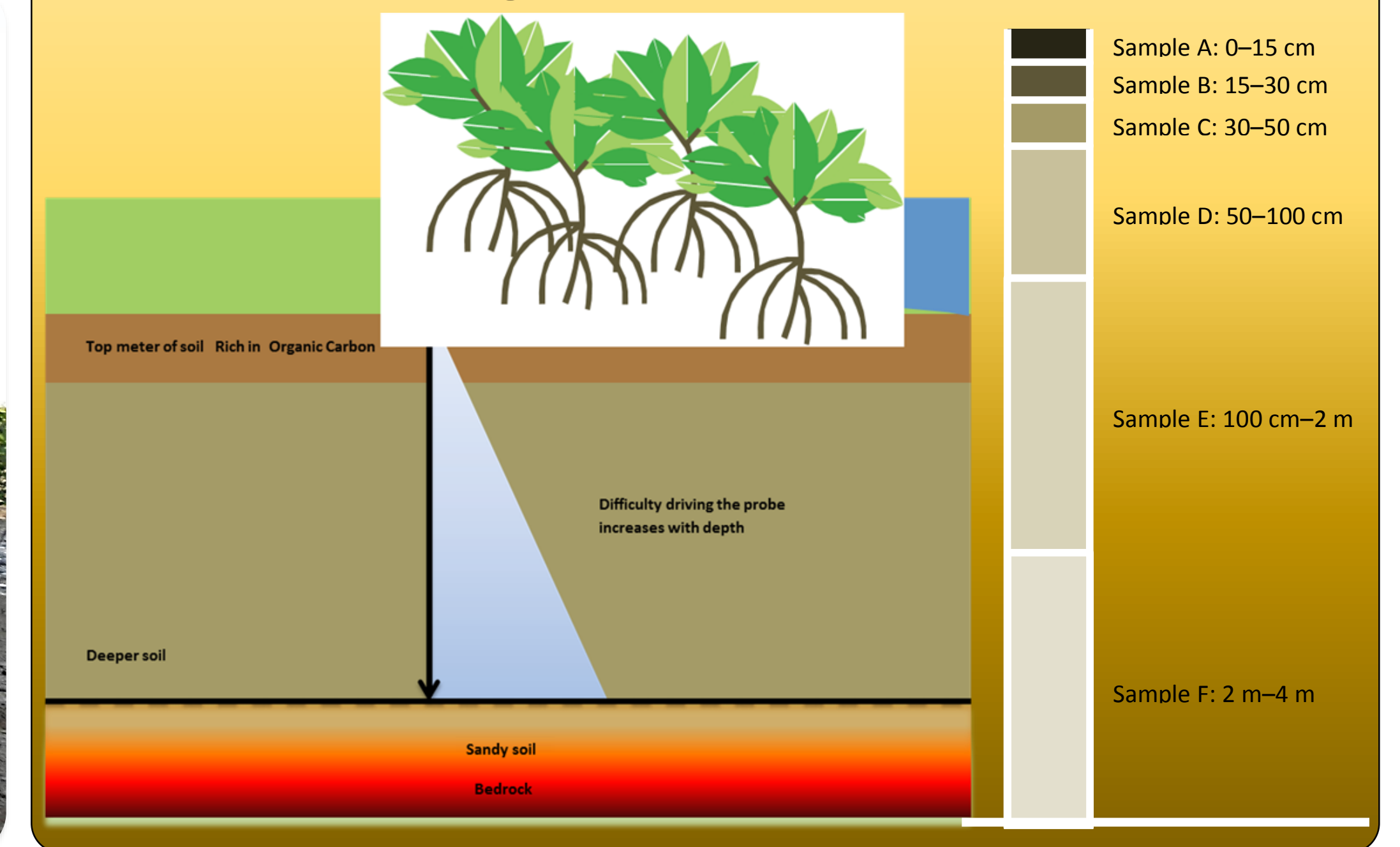
Mangrove soil

- Mangrove soils are different from forest soils by both physical and chemical properties.
 - This soil is covered with water in high tide and mean tide also, and exposed during low tide.
 - The soil colour is blackish because of its carbon richness.
- Here we present Soil Carbon Sequestration in the Mangrove ecosystem of Aghanashini estuary of Karnataka west coast

Study Area



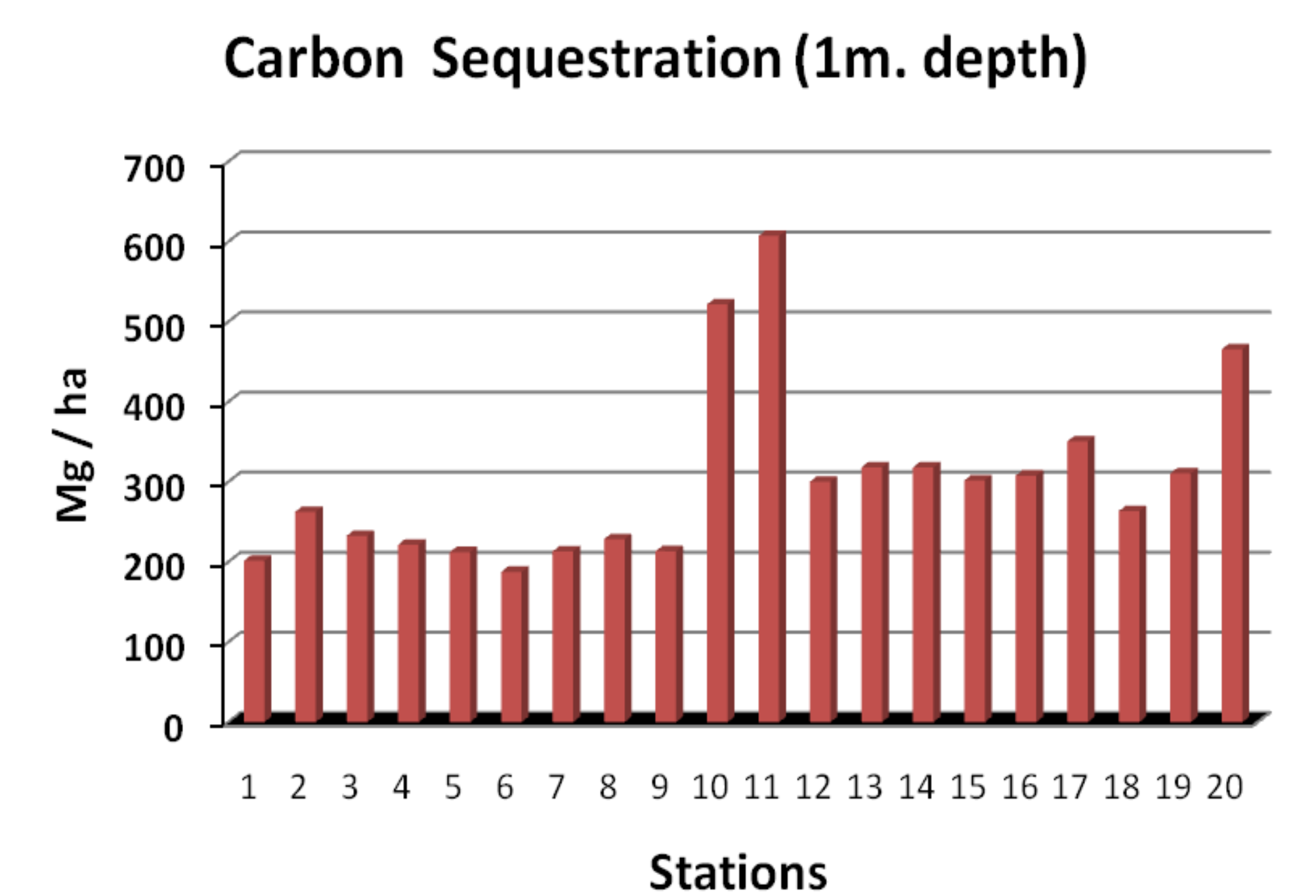
Mangrove Soil Profile



Soil Sampling



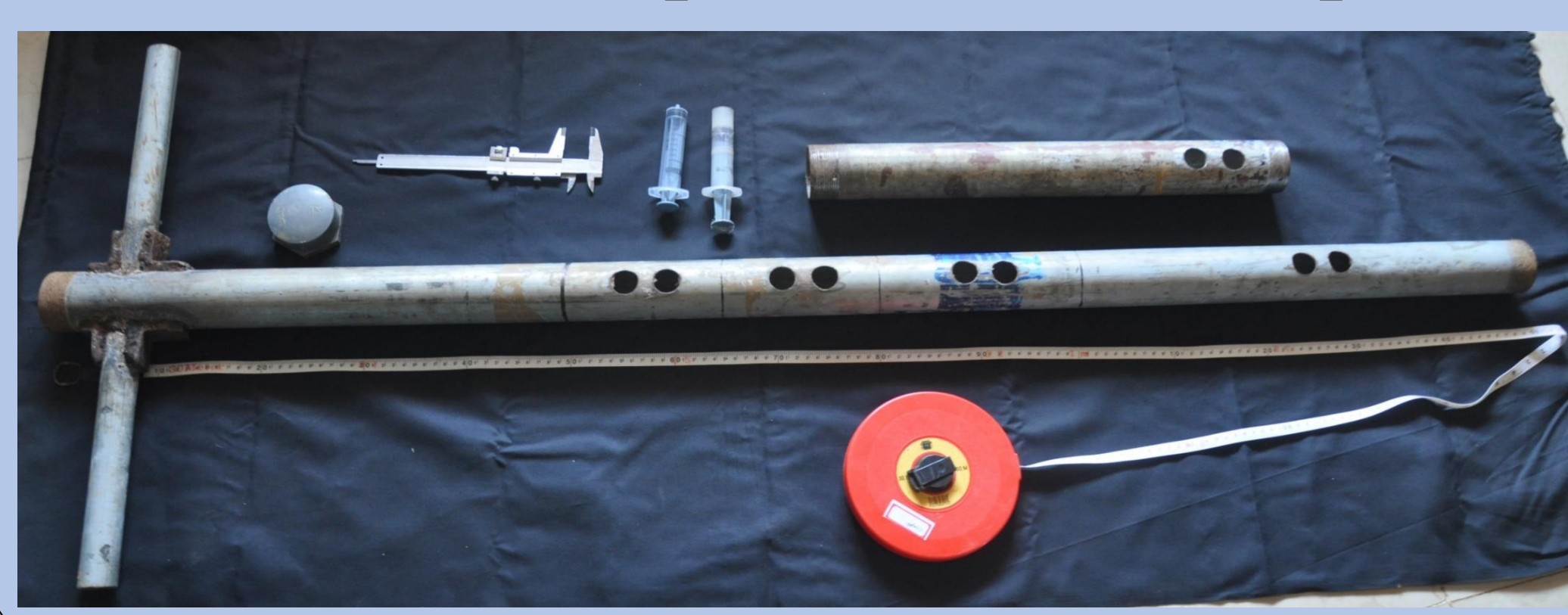
Soil Organic Carbon Variation in Aghanashini Estuary



Materials and Methods

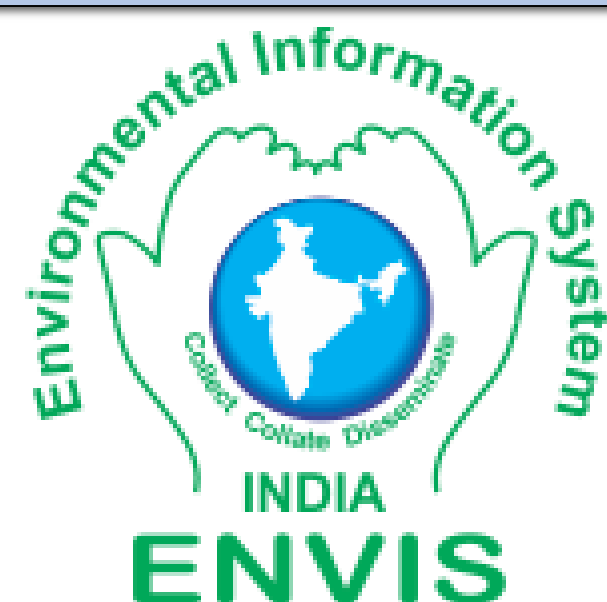
- Soil samples were collected from 20 mangrove sites in the Aghanashini estuary.
- Soil was collected using a corer; from the core samples were drawn from different depth intervals, as prescribed in "The Blue Carbon Initiative" report of UNESCO's Intergovernmental Oceanographic Commission (IOC).
- The results of total carbon sequestration in mangrove soil are expressed in Mega gram (ton) per hectare.
- The soil organic carbon was estimated by Walky and Black method, and values are cross verified using CHN- Elemental analyser

Corer, Syringe, Measuring tape, Vanier callipers, Air tight cap



Results & discussion

- Aghanashini estuarine mangrove areas have stored through ages large pool of soil organic carbon, ranging from 187.7 to 607.1 Mg/ha.
- This is several times more than soil carbon even inside the best rain forests of the world.
- Soil carbon content vary with depth (higher above and lesser in deeper layers/ unit area).
- Older mangrove areas have more soil carbon than the younger ones.
- Mangrove protection is very critical from the climatic stability point of our planet.
- Any type of dredging or mining activities will result in loss of stored organic carbon in soil, leading to increased carbon dioxide level in atmosphere contributing towards global warming and hence the climate change



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