

POTENTIAL OF COASTAL VEGETATIONS IN CARBON SEQUESTRATION FOR MITIGATING THE CLIMATE CHANGE

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Climate change is a great global risk to biodiversity, productivity and functioning of ecosystems. Of which, coastal ecosystems are of great significance for their vulnerability to climate change and capability to mitigate the change as well. Mangroves, seagrasses and coral reefs are the major tropical coastal ecosystems and their coastal vegetations play a major role in CO₂ mitigation. The mangrove forests and seagrass beds are as high as 20 times more efficient in carbon sequestration than tropical forests. Occupying just 0.7% of coastal zone, the mangrove forest ecosystems contribute to 10% of the total net primary production and 25% of carbon burial in the world coastal zone. Therefore, the coastal vegetations serve as potential sink for the major green house gases and help to slow down global warming. They are capable of trapping carbon in their sediment and biomass; hence are recognized as key for the extreme long-term potential to sequester atmospheric carbon. However, due to the increasing rate of deforestation, harvesting and forest degradation, the world's forests including coastal mangroves are estimated to be a net source of carbon. Due to destruction of coastal vegetation, there is an annual reduction of about 30 trillion grams of carbon in the global coast. The annual primary production of global mangroves is 218 trillion grams of carbon; and about 50% of the carbon fixed by mangrove vegetation is unaccounted for. Mineralization in mangroves is largely underestimated, and that the majority of carbon export from mangroves to adjacent waters occurs as dissolved inorganic carbon. Carbon dioxide efflux from sediments and creek waters and tidal export of DIC appear to be the major sinks. In spite of all these facts, the role of mangroves and other coastal vegetations in carbon budget and climate change mitigation is neglected from accounts of the global ocean carbon cycle for the main reason that the marine vegetation occupies only less than 2% of the oceanic surface. A combination of reducing deforestation, coupled with restoring the coverage and health of the coastal vegetations could reduce the emissions of the CO₂. Thus the protection and restoration of coastal vegetations, through comprehensive approach and integrated management would have significant impact.