Blue carbon of sea grasses: A cost effective climate solution

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Introduction

Oceans have been an integral part of human society. In the recent past, oceans are gaining increasing attention as an ecosystem that helps community well being in eco-social aspects. Contribution of ocean to act as a biologically driven carbon flux and a store that sequester more than 80 % of global carbon is not well-documented in many countries. The potential to provide nature-based solutions by these massive ecosystem has been underestimated and overlooked. The blue carbon resources in the coast provide effective measures to combat climate change which shed light to manage ocean for a sustainable future.

Objective

This study focuses on estimating blue carbon in the seagrass meadows in the southern coastal belt of Sri Lanka during the last decade.

Study site

Ocean strip of southern Sri Lanka extending 1 km seaward from the ocean-water line was selected as the study area. length of the coastal belt selected was 232 km from Lunawa (Moratuwa) to Kirinda in Hambanthota.

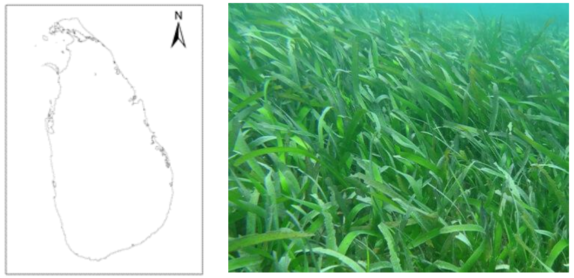

Figure 1: Sri Lanka and picture of some sea grasses

Methodology

Coastal strip of southern Sri Lanka extending 1 km seaward from the ocean-water line was selected as the study area for the pilot study. Landsat 8 Satellite images were downloaded for years 2015, 2017, 2019 and 2021 for the southern coastline (path – 141; raw – 356) from the USGS Earth Explorer website. Satellite image bands 2, 3 and 4 were used and image classification was carried out using a hybrid method of supervised and unsupervised classifications techniques incorporating training sites obtained in the areas of sea grass existence through ground truthing. Images ranging from January to April were selected to avoid influences from the monsoonal changes. Distribution of sea grasses were mapped in order to estimate the Carbon stocks for above ground, below ground and soil carbon using published equations. Above and below ground biomass of seagrass could be determined by multiplying the biomass with the carbon conversion factor of and extrapolation done per hectare whereas organic matter content was determined using the loss of ignition (LOI) technique. This study is a part of an ongoing project and therefore many revisions and refining are expected.

Figure 2: Field surveys and ground truthing

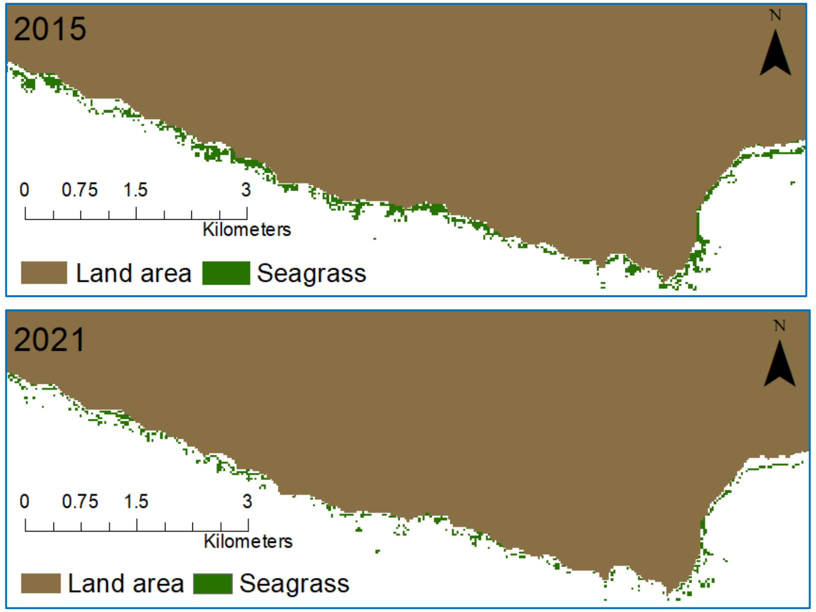

Figure 3: Part of Seagrass distribution (Koggala to Weligama) for years 2015, 2021

Seagrass distribution in the coastal belt

Year	Seagrass area (km^2)
2015	13.55
2017	24.70
2019	12.65
2021	15.92

Table1: Area of seagrass coverage (km^2) for the years 2015, 2017, 2019 and 2021

Conclusion

The results demonstrate the importance of sea grasses in sequestering carbon in the coast, which has not gained adequate attention by the scientific community as well as policy makers. This study highlights as to how, Sri Lanka can adopt Nationally Determined Contribution (NDC) mitigation actions as per the Paris Agreement, by ensuring ecological health of sea grasses. There is a dire need for an attitudinal change of coastal communities and the policy makers to recognize the ecosystem services provided by sea grass beds as many coastal ecosystems are under threat of destruction due to anthropogenic pressure. In this context, this study also provides a framework for community based seagrass conservation programme.

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