

EXECUTIVE SUMMARY

The objective of this report is to highlight the critical role of the oceans and ocean ecosystems in maintaining our climate and in assisting policy makers to mainstream an oceans agenda into national and international climate change initiatives. While emissions' reductions are currently at the centre of the climate change discussions, the critical role of the oceans and ocean ecosystems has been vastly overlooked.

Out of all the biological carbon (or green carbon) captured in the world, over half (55%) is captured by marine living organisms – not on land – hence it is called blue carbon. Continually increasing carbon dioxide (CO₂) and other greenhouse gas emissions are contributing to climate change. Many countries, including those going through periods of rapid growth, are increasing their emissions of brown and black carbon (such as CO₂ and soot) as a result of rapid economic development. Along with increased emissions, natural ecosystems are being degraded, reducing their ability to absorb CO₂. This loss of capacity is equivalent to one to two times that of the annual emissions from the entire global transport sector.

Rising greenhouse gases emissions are producing increasing impacts and changes worldwide on weather patterns, food production, human lives and livelihoods. Food security, social, economic and human development will all become increasingly jeopardized in the coming decades.

Maintaining or improving the ability of forests and oceans to absorb and bury CO₂ is a crucial aspect of climate change mitigation. The contribution of forests in sequestering carbon is well known and is supported by relevant financial mechanisms. In contrast, the critical role of the oceans has been overlooked. The aim of this report is to highlight the vital contribution of the oceans in reducing atmospheric CO₂ levels through

sequestration and also through reducing the rate of marine and coastal ecosystem degradation. It also explores the options for developing a financial structure for managing the contribution oceans make to reducing CO₂ levels, including the effectiveness of an ocean based CO₂ reduction scheme.

Oceans play a significant role in the global carbon cycle. Not only do they represent the largest long-term sink for carbon but they also store and redistribute CO₂. Some 93% of the earth's CO₂ (40 Tt) is stored and cycled through the oceans.

The ocean's vegetated habitats, in particular mangroves, salt marshes and seagrasses, cover <0.5% of the sea bed. These form earth's blue carbon sinks and account for more than 50%, perhaps as much as 71%, of all carbon storage in ocean sediments. They comprise only 0.05% of the plant biomass on land, but store a comparable amount of carbon per year, and thus rank among the most intense carbon sinks on the planet. Blue carbon sinks and estuaries capture and store between 235–450 Tg C every year – or the equivalent of up to half of the emissions from the entire global transport sector, estimated at around 1,000 Tg C yr⁻¹. By preventing the further loss and degradation of these ecosystems and catalyzing their recovery, we can contribute to offsetting 3–7% of current fossil fuel emissions (totaling 7,200 Tg C yr⁻¹) in two decades – over half of that projected for reducing rainforest deforestation. The effect

would be equivalent to at least 10% of the reductions needed to keep concentrations of CO₂ in the atmosphere below 450 ppm. If managed properly, blue carbon sinks, therefore, have the potential to play an important role in mitigating climate change.

The rate of loss of these marine ecosystems is much higher than any other ecosystem on the planet – in some instances up to four times that of rainforests. Currently, on average, between 2–7% of our blue carbon sinks are lost annually, a seven-fold increase compared to only half a century ago. If more action is not taken to sustain these vital ecosystems, most may be lost within two decades. Halting degradation and restoring both the lost marine carbon sinks in the oceans and slowing deforestation of the tropical forests on land could result in mitigating emissions by up to 25%.

Sustaining blue carbon sinks will be crucial for ecosystem-based adaptation strategies that reduce vulnerability of human coastal communities to climate change. Halting the decline of ocean and coastal ecosystems would also generate economic revenue, food security and improve livelihoods in the coastal zone. It would also provide major economic and development opportunities for coastal communities around the world, including extremely vulnerable Small Island Developing States (SIDS).

Coastal waters account for just 7% of the total area of the ocean. However the productivity of ecosystems such as coral reefs, and these blue carbon sinks mean that this small area forms the basis of the world's primary fishing grounds, supplying an estimated 50% of the world's fisheries. They provide vital nutrition for close to 3 billion people, as well as 50% of animal protein and minerals to 400 million people of the least developed countries in the world.

The coastal zones, of which these blue carbon sinks are central for productivity, deliver a wide range of benefits to human society: filtering water, reducing effects of coastal pollution, nutrient loading, sedimentation, protecting the coast from erosion and buffering the effects of extreme weather events. Coastal ecosystem services have been estimated to be worth over US\$25,000 billion annually, ranking among the most economically valuable of all ecosystems. Much of the degradation of these ecosystems not only comes from unsustainable natural resource use practices, but also from poor watershed management, poor coastal development practices and poor waste management. The protection and restoration of coastal zones, through coordinated integrated management would also have significant and multiple benefits for health, labour productivity and food security of communities in these areas.

The loss of these carbon sinks, and their crucial role in managing climate, health, food security and economic development in the coastal zones, is therefore an imminent threat. It is one of the biggest current gaps to address under climate change mitigation efforts. Ecosystem based management and adaptation options that can both reduce and mitigate climate change, increase food security, benefit health and subsequent productivity and generate jobs and business are of major importance. This is contrary to the perception that mitigation and emission reduction is seen as a cost and not an investment. Improved integrated management of the coastal and marine environments, including protection and restoration of our ocean's blue carbon sinks, provides one of the strongest win-win mitigation efforts known today, as it may provide value-added benefits well in excess of its costs, but has not yet been recognized in the global protocols and carbon trading systems

KEY OPTIONS:

In order to implement a process and manage the necessary funds for the protection, management and restoration of these crucial ocean carbon sinks, the following options are proposed:

1 Establish a global blue carbon fund for protection and management of coastal and marine ecosystems and ocean carbon sequestration.

- a. Within international climate change policy instruments, create mechanisms to allow the future use of carbon credits for marine and coastal ecosystem carbon capture and effective storage as acceptable metrics become available. Blue carbon could be traded and handled in a similar way to green carbon – such as rainforests – and entered into emission and climate mitigation protocols along with other carbon-binding ecosystems;
- b. Establish baselines and metrics for future environmentally sound ocean carbon capture and sequestration;
- c. Consider the establishment of enhanced coordination and funding mechanisms;
- d. Upscale and prioritize sustainable, integrated and ecosystem-based coastal zone planning and management, especially in hotspots within the vicinity of blue carbon sinks to increase the resilience of these natural systems and maintain food and livelihood security from the oceans.

2 Immediately and urgently protect at least 80% of remaining seagrass meadows, salt marshes and mangrove forests, through effective management.

Future funds for carbon sequestration can contribute to maintaining management and enforcement.

3 Initiate management practices that reduce and remove threats, and which support the robust recovery potential inherent in blue carbon sink communities.

4 Maintain food and livelihood security from the oceans by implementing comprehensive and integrated ecosystem approaches aiming to increase the resilience of human and natural systems to change.

5 Implement win-win mitigation strategies in the ocean-based sectors, including to:

- a. Improve energy efficiency in marine transport, fishing and aquaculture sectors as well as marine-based tourism;
- b. Encourage sustainable, environmentally sound ocean based energy production, including algae and seaweed;
- c. Curtail activities that negatively impact the ocean's ability to absorb carbon;
- d. Ensure that investment for restoring and protecting the capacity of ocean's blue carbon sinks to bind carbon and provide food and incomes is prioritized in a manner that also promotes business, jobs and coastal development opportunities;
- e. Catalyze the natural capacity of blue carbon sinks to regenerate by managing coastal ecosystems for conditions conducive to rapid growth and expansion of seagrass, mangroves, and salt marshes.

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