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INTERNATIONAL ALLIANCE TO COMBAT OCEAN ACIDIFICATION

UNITED NATIONS FOUNDATION

Strengthening UNFCCC Response to Ocean Warming, Acidification and Deoxygenation:

Recommendations for Blue Carbon Ecosystems and Food Security

Prepared for UNFCCC SBSTA58, in partnership with the Deep Ocean Stewardship Initiative

UNFCCC

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UNFCCC RESPONSE TO OCEAN WARMING, ACIDIFICATION, AND DEOXYGENATION IS LACKING

- The most recent UN Intergovernmental Panel on Climate Change (IPCC) AR6 Report shows ocean warming, ocean acidification & deoxygenation will continue to increase in the 21st century at rates dependent on future emissions of carbon dioxide and greenhouse gases (GHG).

- The IPCC AR6 states with high confidence that ocean warming, and ocean acidification have already affected food production including shellfish aquaculture and fisheries in some regions (IPCC, 2022). The IPCC consistently reports impacts and risks to ocean ecosystems from climate change under various warming scenarios.

- Despite dire warnings from the Intergovernmental Panel on Climate Change, the impacts of ongoing ocean warming, acidification, and deoxygenation caused by increased carbon dioxide and GHG emissions are often misunderstood or not reflected across mainstream climate mitigation or adaptation priorities across the UNFCCC.

- The lack of specific response to ocean warming, acidification and deoxygenation across the UNFCCC poses a substantial and currently unaccounted for risk to coastal community resources, well-functioning marine ecosystems, seafood security and economies.

- Lack of specific response to ocean warming, acidification and deoxygenation also risks undermining the effectiveness of more mainstream mitigation and conservation and tools like blue carbon ecosystems and habitat restoration efforts, marine protected areas, nature-based solutions, and climate-resilient fisheries and aquaculture.

- Finally, lack of recognition of acidification and deoxygenation by the UNFCCC risks exacerbating these effects through ocean-based climate interventions that seek mitigation through enhanced primary production or carbon disposal in the deep ocean.

THE OCEAN AND CLIMATE DIALOGUE PRESENTS AN OPPORTUNITY TO CHANGE THAT

- While increasing ambition to meet Paris Agreement goals and targets (and specifically, reducing CO_2 emissions) is essential for mitigating ocean acidification, there are actions that Parties and UN bodies can be taking now that will allow for increased mitigation through marine aquatic vegetation and and support adaptation of vulnerable seafood species.

- To be successful in implementation, Parties must have a more comprehensive stocktake of regional/ local information that will allow governments to prioritize and evaluate their risks and response strategies. This is especially true across marine dependent, developing regions with little data on local trends and impacts of ocean warming, acidification, and deoxygenation.

- UNFCCC bodies and mechanisms can be leveraged to ensure adequate and equitable investments in climate-ocean change information, gaps analysis, and capacity or technology transfer that result in better preparedness, mitigation, and adaptation choices for all Parties.

WHY IS OCEAN ACIDIFICATION AND DEOXYGENATION INFORMATION IMPORTANT FOR SUPPORTING BLUE CARBON ?

- Marine aquatic vegetation and coastal habitats offer multiple options for mitigating and remediating climate change impacts.

- Marine aquatic vegetation that sequesters carbon in the ocean are called “Blue Carbon” ecosystems. Blue Carbon sequestration can be achieved through some types of submerged aquatic vegetation ecosystems like mangroves, salt marshes and some seagrasses.

- However, even actions such as protecting and restoring kelp and eelgrass —ecosystems with root systems that may not be ideal for long-term carbon sequestration — can still improve water quality locally and provide refuge for marine species from acidified and other stressful conditions caused by climate change.

- In some cases, these habitats have been shown to remediate or buffer against impacts of acidification and deoxygenation in nearshore coastal waters—raising the pH and oxygen levels within the submerged ecosystems—and improving the growth and survival of species that are sensitive to ocean acidification (Unsworth et al., 2012; Chan et al., 2016).

- It’s important that governments improve their regional and local understanding of the role that mangroves, seagrass, salt marsh and kelp could play in sequestering carbon and remediating local conditions of acidification and deoxygenation. Localized marine aquatic vegetation and coastal habitats can help improve the survivability of many marine species and the ecosystems they depend on.

- Increased carbon chemistry monitoring and information –including that of ocean acidification and deoxygenation local trends and changes—are required to help Parties evaluate the potential of marine ecosystems and coastal habitats to support climate mitigation or other co-benefits.

- Additionally, incorporating carbon chemistry, ocean acidification, and deoxygenation information at a local level can support climate-smart Marine Protected Areas and other conservation measures by using carbonate chemistry information to identify best locations for Blue Carbon or nature-based projects to be deployed and evaluated.


WHAT CAN BE DONE TO SUPPORT BLUE CARBON AND CO-BENEFITS OF MARINE AND COASTAL VEGETATION THROUGH THE OCEAN CLIMATE DIALOGUE:


1. Expand guidance for incorporating Blue Carbon mitigation opportunities and information needs across NDCs/ NAPs.

2. The SBSTA should support Parties in developing technical guidance and capacity needs for evaluating the role of Blue Carbon and the climate co-benefits of marine aquatic vegetation and coastal habitats across NDCs or NAPs.

3. The Ocean Climate Dialogue should create a working group dedicated to exploring the technical and capacity needs for Parties in deploying and evaluating projects that utilize marine aquatic vegetation and coastal habitats across freshwater, coastal and ocean ecosystems to:

    - Sequester carbon through aquatic vegetation ecosystems like mangroves, salt marshes and some seagrasses that link with UNFCCC carbon market mechanisms.
    - Remediate or reduce coastal acidification and deoxygenation through aquatic ecosystems like mangroves, salt marshes, seagrass beds and kelp forest.
    - Support climate-smart Marine Protected Areas and other conservation measures by using carbonate chemistry and oxygen information to identify best locations for Blue Carbon or nature-based projects to be deployed and evaluated.
    - Improve water quality, limit coastal erosion and provide protection from extreme events.

4. Promote identification by the IPCCC of science questions and gaps that must be addressed to more effectively identify viable blue-carbon solutions to warming, acidification, and deoxygenation.

5. Prioritize equity, justice, cooperation, and inclusive decision making with local communities and Indigenous People across projects related to marine aquatic vegetation and coastal habitats. This includes recognition of Tribal sovereigns and Treaty rights and inherent rights of Indigenous peoples across mitigation measures.

WHY IS OCEAN ACIDIFICATION AND DEOXYGENATION INFORMATION IMPORTANT FOR SUPPORTING FOOD SECURITY AND SOVEREIGNTY?

- The IPCC SROCC and AR6 state with high confidence that ocean warming, ocean acidification and ocean deoxygenation have already affected species biomass, composition and distributions leading to changing food production including shellfish aquaculture and fisheries in some regions (IPCC, 2019; 2022).

- Ocean acidification and deoxygenation threaten biodiversity and adversely impact commercial, recreational, subsistence, and ceremonial shellfish harvest and other seafood species around the world like crab, lobsters, shrimp, clams, mussels, sea urchins, corals, squid and some species of plankton and fish (Johnson, 2016; Kroeker, 2013, Cheung et al. 2022).

- Scientific research demonstrates that acidification and deoxygenation can reduce growth rates in some species (Sampaio et al. 2020), can impact plankton which in turn affects entire marine food webs and can even have negative impacts on behavior of fish (Munday et al., 2009).

- Recent reports from the NE Atlantic region show negative impacts from increasing ocean acidification and warming on Atlantic cod. Baltic cod are negatively affected by deoxygenation (Limburg and Casini 2019). Ocean acidification is also adversely affecting cold water corals, critical habitats for regional fisheries. (McGovern et al., OSPAR OA Assessment, 2023).

- Some studies predict that by 2050, coral reefs will dissolve faster than they can build their skeletons (Eyre, 2018). Loss of coral reefs will mean loss of critical habitat for important seafood.

- These trends are especially alarming when paired with the Food and Agriculture Organization of the United Nations (FAO) 2022 report, "State of the World Fisheries and Aquaculture" which shows that global consumption of aquatic foods has increased significantly, with the world now consuming more than five times the quantity consumed nearly 60 years ago.

- While the IPCC can supply information on global trends, there is limited data and information about the impacts of climate-ocean change on locally relevant seafood species, posing barriers to equitable or robust adaptation planning, risk assessment, and response. (IPCC, 2022, p. 27).

- Internationally, 70% of all ocean acidification knowledge generation is conducted across North American and European countries (Tilbrook B., 2019). Few regions in the world have access to the technology and institutional capacity to support robust climate adaptation, like those strategies outlined across the IPCC or across the UN Sustainable Development Goals (Polejack A., 2021)

- To fully realize adaptive management potential of keystone seafood species to climate-related changing ocean conditions, the UNFCCC must outline a process for financing and strategically closing these information gaps with a priority towards adaptation measures that directly support food security and sovereignty at regional and local sales.

WHAT CAN BE DONE TO SUPPORT FOOD SECURITY AND SOVEREIGNTY THROUGH THE OCEAN CLIMATE DIALOGUE:

1. Ocean acidification and deoxygenation should be considered as relevant metrics when assessing appropriate timelines, trajectories, and funding for mitigation and adaptation action across the UNFCCC to "ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner" as called for by Article 2. (Ellycia R. Harrould-Kolieb, 2016).

2. The UNFCCC Ocean Climate Dialogue must emphasize the importance of regional risk and vulnerability assessments to help Parties identify the combined impacts of ocean warming, acidification, and deoxygenation to their resources and along their coastline.

3. In partnership with UN Decade of Ocean Science for Sustainability relevant programmes—establish a framework to outline regional priority gaps in data and information related to seafood security, alongside an inventory of technological and institutional capacity needs for measuring coastal impacts of ocean warming, acidification, and deoxygenation. This should include improving knowledge of impacts (including biological impacts of keystone seafood fisheries and aquaculture), alongside understanding socio-economic and socio-cultural significance.

4. Actively collaborate with the NAP Taskforce of the Adaptation Committee and Nairobi Work Programme Ocean Expert Group, to identify adaptation pilot projects that will support vulnerable seafood species, habitats, or seafood dependent communities and utilize available information or projections related to coastal manifestations of ocean warming, acidification, and deoxygenation.

5. In partnership with the Standing Committee on Finance, explore links between existing climate finance program funds and ocean monitoring, science and adaptation needs outlined through NDCs, NAPs, and national adaptation projects. These should include program funds that emphasize (1) food security; (2) nature-based solutions; (3) water quality (4) coral reef resilience; or (5) early warning and climate information systems.

6. Request the Green Climate Fund (GCF) and Global Environment Facility (GEF) to reduce barriers for regional funding applications that advance monitoring, science and research capacity related to responding to ocean warming, acidification, and deoxygenation. These pilots should build upon regional partnerships already in place in Latin America, the Pacific Islands and Africa. They should be designed to enhance capacity for informing and evaluating coastal adaptation projects over the next ten years.

7. Engage other UN bodies, including FAO, and relevant partners in expediting multi-stressor research on the adaptation potential of keystone seafood species. This could include linkages with the Global Goal on Adaptation and Post-2020 Global Biodiversity Framework.

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Additional Resources :

- OA Alliance Submission to SBSTA52 (Turner, 2020)
- OA Alliance Submission to SBSTA56 (Turner, 2022)
- OA Alliance Climate Finance Recommendations for Advancing Ocean Adaptation (Turner, 2022)