

K4D International Nature Learning Journey

Session 4: The Ocean and Marine Ecosystem: challenges, drivers and solution

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WorldFish's mission is for an inclusive world of healthy and well-nourished people and a sustainable blue planet, now and in the future. Their vision is to end hunger and advance sustainable development by 2030, through science and innovation to transform food, land and water systems with aquatic foods for healthier people and planet. Over 3 billion people in the world rely on fish as a major source of animal protein. Aquatic food also creates millions of employment opportunities, particularly for small scale food producers, half of whom are women. 62% of fish food will come from aquaculture in the future.

How is climate change affecting aquatic food systems? There are multiple impacts due to temperature and sea level rises. By 2100 all countries will face 'higher' or 'very high' hazard scores for marine and freshwater fisheries and freshwater aquaculture. This will significantly affect lower income countries. It's worrying in the sub-Saharan African context because, according to other projections from the World Bank, while we will see a growing demand in consumption and production more broadly across the globe, Africa seems to lag behind. As the only region where we will see a decline in projected annual per capita fish consumption.

Sardines are highly affordable, small and nutritious fish which in the past have been accessible to many, but they are disappearing from the waters around many countries, like Senegal, due to migration to cooler waters. The fishmeal industry is also booming in Senegal, which hoovers up the fish and processes it to powder which is shipped to aquaculture farms in other countries. This is then used to produce more fish which may not necessarily be consumed by low-income groups. This alarming trend illustrates ill-informed short-term gains and poor decision making around how we sustainably use and manage our resources.

There's growing momentum on marine protected areas and the **30by30** movement will be hugely useful to protect biodiversity. Water bodies across the world are highly interconnected, and we need to use this to inform decision making. We need to identify biodiversity hotspots whilst remembering the socio-economic impacts on people also. We have to start thinking beyond resilience and aim for a shared blue prosperity that includes building resilience of aquatic ecosystems, building prosperous livelihoods and also strengthening our infrastructure.

Some good news in recent weeks - we have harnessed digital solutions for sustainable and climate resilient aquatic food systems and designed an app to use in Bangladesh initially, which will give information to a fish farmer around temperature and biophysical changes occurring, to give them the ability to predict and take mitigating action. Hoping to reach over 100,000 fish farmers by the end of this year.

Nature-based solutions (NbS) involves aligning incentives and investments for sustainable production of aquatic food. The concept is very simple – how do we reward good practice?

For example, a fiscal incentive mechanism where producers are incentivised to change their behaviour and discouraged from unsustainable practices. Legal policy must do more to help end illegal fishing. Some legal policy instruments fuel illegal fishing practices within and beyond national jurisdictions, threatening food and nutritional security and biodiversity conservation. Fishing subsidies are a critical element in the WTO negotiations. The ongoing debate of ending harmful fishing subsidies is part of the SDGs. So much pressure on natural resources would be lifted by eliminating fishing subsidies.

We need to eliminate food loss and waste. 35% of fish and seafood is lost during the post catch, processing, distribution, and consumption stages. Solutions include access to technical innovations to minimise food loss and waste, and enhancing access to market services as a lot of fish is wasted before it reaches the market. Aquatic food systems can be a sink to agricultural waste, promoting a circular economy.

There's growing interest in seaweed (or sea veggies) which has potential to sequester GHG emissions, provide nutritious food and create employment opportunities for many. Farming seaweed involves very simple techniques, cheap equipment, is fast growing and easy to harvest.

Key messages: realising a shared blue prosperity for all through aquatic food systems is possible. To do so, we have to stop tinkering around the edges and focus on systemic constraints; deploy at scale best fit-for-context technical and social innovations; align incentives and investments to nudge good behaviour; tackle inefficiencies by eliminating food loss and waste; and mainstream aquatic food systems in national and global policy instruments.

Stephanie Bale, Programme Manager & Policy Advisor, International Forests & Landscapes, Defra.

Case study on the Blue Forests Initiative: community led mangrove management and restoration. Mangroves are coastal intertidal trees that have adapted to live in harsh conditions that most trees couldn't survive in. They are located along coasts in proximity to the equator, and they tolerate low oxygen soil and can handle the rise and fall of tides. Given their unique characteristics and location, they are very valuable as productive ecosystems for the triple win for people, nature and climate. Their estimated worth is up to \$800 billion US dollars. They can capture and store huge amounts of CO₂, between 3 to 5 times more than tropical forests can. Mangroves support around 120 million people worldwide, providing natural coastal protection. Utilising mangrove restoration for nature-based solution for coastal protection is 5 times more effective than grey infrastructure. Mangroves also provide valuable source of timber and fuel wood, and support traditional livelihoods such as small scale fisheries, as well as tourism with over 2,000 mangrove related attractions globally.

Mangroves face a number of anthropogenic and natural threats. As much as 50% of mangrove forests have been lost in the last 50 years, and a further 26% of mangrove forests worldwide are degraded. This comes from pressures from unregulated harvesting, intensified fishing, demand for building materials and fuel wood as populations grow, logging, climate change and pollution. Human activity is massively destroying ecosystems, with some studies showing that disturbed mangrove forests have 20-40% less biodiversity in terms of abundance than undisturbed mangrove forests. But by changing the way we interact with nature we can also become a force for good. Restoration and effective local management of mangroves can reduce the rate of deforestation, improve local livelihoods,

prevent carbon emissions and aid the recovery of these important habitats. This is where the Blue Forests Initiative comes in. The programme focuses on Madagascar and Indonesia, in communities which rely on mangroves to survive. Indonesia has the largest extent of mangrove cover and is most impacted by human drive pressures. Madagascar has large restoration potential and is the poorest country in the world that's not in a conflict. Mangrove deforestation and degradation in both countries is driven primarily by a lack of land and tenure rights and management techniques. The Blue Forests Initiative addresses these drivers by working with local coastal communities, private sector and national governments to protect and restore mangrove ecosystems, create new sustainable livelihoods, support community health, support women's empowerment and increase climate resilience.

There are five components to the programme, including forestry management, blue carbon, small scale fisheries' management and its improvement, livelihood diversification, and community health and women's empowerment. Mangroves protect initiatives that put people at the front and centre of sustainable change. The programme looks to benefit 86,000 people in terms of livelihoods, by working with state and non-state actors to identify pilot and implement livelihood interventions for local communities. This combination of strategies is predicted to be worth over £49.5 million over 20 years and the transformational impact of these models cannot be understated. The programme exemplifies the need for a holistic, integrated approach to mangrove protection and restoration. There's huge potential to include mangrove conservation in country's NDCs to address climate change and this can be done in a way that benefits the triple win.

DISCUSSION

We know what needs to be done but how do we achieve scale? What's needed to accelerate the incentive structure in the right direction?

There are different models out there that can work, and we have a strong foundation to show what can work and what needs to be done. However, the conservation of marine habitats is far behind that of terrestrial, so we don't have the same amount of time and finance is needed. With COP26 coming up we have a huge opportunity to try and move that forward.

Incentives at local and national levels can be successful. In Bangladesh, the government provided communities with a compensation scheme in terms of food, access to credit and training. Five years later we see a very encouraging recovery, by the government using fiscal tools to give a nudge to the natural resource management. In terms of subsidies, most of the rhetoric we hear about is subsidies given to support small scale fishers, but if we look at the global figures, 84% goes to large scale business, so it's not fighting poverty and addressing environmental challenges. Essentially it is enabling industry to go and Hoover out the sea. We need to shift from these harmful types of subsidies to the good, as in the Bangladesh example.

What scope do we see for climate finance? Will there be a fundamental shift over the next five to ten years?

The past year has shown that anything can happen. Finance going to the right place is one thing, but engagement at all levels is vital, with a balance between top-down interventions and bottom-up community interventions. One of the challenges the Blue Forests programme has experienced is trying to marry community and government needs.

What's your view on the monitoring and evaluation side of fisheries and mangroves, how can that help change the incentives?

The Blue Forest programme are very conservative with their estimates. It's highly likely that the programme is actually saving more carbon than stated. The estimates are very much based on the above ground carbon, because below water is very difficult to manage and monitor. Blue Forests are pushing for communities to be able to do that monitoring themselves, so they have adopted a methodology which is easily learnt and replicated.

There is a mushrooming of government reporting systems, so how do we simplify these and make them cost effective? Even better if we can create employment opportunities for communities through those. WorldFish have developed an app, 'Pescas', which is a digital solution that monitor fishing activities, and the data is being populated by the fishers.

Will there be potential for a fundamental shift towards novel foods (such as seaweed)? Can the ocean produce that in a sustainable way?

This is possible. We know the nutritional value of these novel foods but have we made that cultural shift, for our preference for food? And are they going to deliver food for those who need it the most? From a pragmatic point of view, if it creates an opportunity for employment and income generation, that creates more disposable income. Innovatively, moving forward there will be more awareness of utilisation.