Transforming Blue Food Systems

*Blue foods include aquatic animals, plants and algae cultivated or captured in freshwater and marine environments.

There is growing recognition that food systems must be transformed. Blue foods can play a central role in that transformation, providing vital nutrition, reducing contributions to climate change, sustaining natural systems and supporting livelihoods and culture. Global demand for blue food is expected to double by 2050, yet blue food is often ignored in decision-making. Like for all food systems, growing demand poses both opportunities and challenges. Thoughtful investments and policies will need to be considered to foster a thriving, regenerative blue food sector.

Key Facts & Findings

1. **Blue foods are rich and diverse sources of nutrition.**
   More than 2,500 species or species groups of blue food are caught or cultivated. These blue foods are often dense in protein and essential nutrients – over 3 billion people get 20% of their animal protein from blue food, along with essential micronutrients and omega-3 fatty acids. The top seven categories of nutrient-rich animal-source foods are all blue foods, ahead of the most nutrient-rich terrestrial protein, beef. Not all blue foods are the same, however: Small pelagic fish, for example, have about eight times more iron, five times more omega-3 fatty acids and four times more Vitamin B12 than tilapia.

2. **Blue foods generally have a lower environmental footprint than terrestrial animal-source foods.**
   The diverse range of blue food includes food with exceptionally low or negative greenhouse gas emissions, such as bivalves and seaweed. Increasing these food supplies can help meet demand without increasing carbon emissions. Some blue food systems, such as fed aquaculture of species like carp, catfish, tilapia and salmon, and wild-capture fisheries like sardines and herring, are already highly efficient

but can be further improved. The use of low-fuel gear, for example, can reduce greenhouse gas emissions in some fisheries by 61%, while reducing feed usage and switching to deforestation-free inputs can reduce emissions from aquaculture by half.

3. **Blue food supply chains offer important opportunities for social and economic development.**
   Global blue food production supports more than 800 million livelihoods. Exports by producers large and small provide $38 billion in annual revenue for developing countries, more than all agricultural commodities combined. Small-scale actors are the engine of blue food systems – about 90% of jobs in fisheries are small-scale. These actors are diverse and vary widely in their assets and capacities, degree of specialization or diversification and the challenges they face.

4. **Blue food systems are threatened by climate change.**
   Warming waters, ocean acidification, sea level rise, storms and rainfall changes threaten the productivity, quality and safety of blue foods, especially of wild-capture fisheries in ocean and inland waters. Without rapid climate mitigation, by 2050 over 50 countries that heavily depend on blue foods will face high climate hazards with limited capacity to adapt, creating a "triple jeopardy."

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5. **The health and economic benefits of blue foods are distributed unevenly.**
Blue food value chains employ roughly equal numbers of men and women, but influence, voice and access to benefits are often highly unequal. While industrial production and exports tend to support wealth generation, they can erode the livelihoods, food security and cultural benefits generated by small-scale actors. Explicitly including the practices, knowledge and rights of underrepresented voices – including Indigenous Peoples and traditional small-scale fishers – in policy is critical to address inequities.

Manage blue foods as integral parts of food systems

The potential of blue foods will be fully realized only if they are brought into food system decision-making. Blue foods should be built into strategies that meet holistic food system goals. All actors – governments, the private sector and civil society – have roles to play. The first step is to identify and reform policies and practices – like subsidies that enable overfishing and other unsustainable practices or production that harm the environment – that impede transformation. We recommend three targeted priorities for blue food transformation.

1. **Embrace the diversity of blue foods to support health, sustainability and climate resilience goals.**
The future of food systems lies in moving away from commoditization and industrialization and toward diversity. By including a diversity of blue foods in dietary guidelines and programs, governments can transform demand, shape preferences and build markets for healthier, more sustainable options. They will need to collect data on fisheries, supply chains and consumption that reflect the diversity of blue food species and actors in the sector. Companies should shift to production methods and producers that sustainably harvest a diversity of nutrient-dense species, and work with retailers, chefs and other public-facing partners to make these options more attractive and convenient for consumers.

2. **Recognize and support the central role of small-scale actors.**
Policies and practices should be designed to strengthen the capabilities of small-scale actors to innovate and adapt in the face of environmental and economic shifts. For example, governments can establish environmental and labor regulations, policies and investment criteria that incentivize investment in sustainable small-scale fisheries and aquaculture. Retailers can source from local small-scale fishers and let their customers know that they do. They can work with, or help develop, groups that bring together individual fishers and fish farmers in cooperatives. Large companies can extend financial services to small-scale supply chain partners or support innovations to facilitate more sustainable and efficient operations.

3. **Establish human rights in policy and practice** to steer food systems toward more equitable distribution of blue food benefits. Governments should secure economic and nutritional benefits through trade policies and prioritize access to blue foods by communities that need them most. They can embed principles of justice, equitable participation and the right to food in these policies and agreements. The private sector should adopt an ambitious vision of social and environmental responsibility that centers worker voices in decision-making and recognizes a broad range of social dimensions in their supply chains, including impacts to local livelihoods and the representation of marginalized communities.

The Blue Food Assessment brings together over 100 scientists from more than 25 institutions around the world. The Stockholm Resilience Centre at Stockholm University and Stanford University's Center for Ocean Solutions and Center on Food Security and the Environment are lead science partners and EAT is the lead impact partner.

Additional recommendations for action can be found at https://bluefood.earth/policy/

Read the latest Blue Food Assessment research at https://bluefood.earth/science/