Blue Food Assessment

Brief for Environment Decision-Makers

Food systems are major contributors to environmental change — through pollution, land-use change, greenhouse gas emissions and use of freshwater and other resources. Blue foods* can be an important part of sustainable food system solutions by lowering the environmental footprint of nutritious diets and reducing pressures on over-taxed terrestrial systems. Blue food systems also need healthy aquatic ecosystems to function and thus are important beneficiaries of environmental management and climate policies. Integrating blue foods into environmental governance can create opportunities to advance not only environmental but also economic, nutrition and social goals, helping governments address multiple challenges at once.
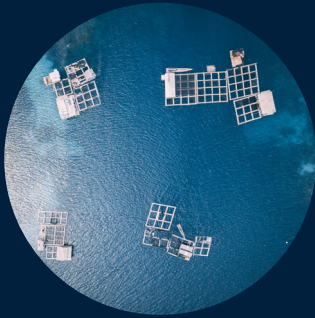
*Blue foods include aquatic animals, plants and algae cultivated and captured in freshwater and marine environments.

Key Facts & Findings

1. **Blue foods can play a key role in creating healthier, more sustainable food systems.**
More than 2,500 animal species or species groups of blue foods are caught and harvested — about 96 million tons in wild-capture fisheries and 82 million tons in aquaculture. These diverse species are a rich source of sustainable and affordable nutrition, providing protein, essential micronutrients and omega-3 fatty acids. Preserving and promoting the diversity of blue food systems — not only of species but also of production methods, actors and markets — can bolster livelihoods and enhance food system resilience.

2. **Healthy aquatic ecosystems are key for the preservation and expansion of blue food systems.**
A range of both local stressors — such as habitat fragmentation and degradation by urban, industrial and agricultural pollution — and global stressors — like the warming waters, ocean acidification, sea level rise, storms and rainfall changes resulting from climate change — threaten the productivity, quality and safety of blue foods. Significant investments

in adaptation and resilience are needed to ensure sustained blue food contributions under climate change, especially in Africa, South and Southeast Asia and Small Island Developing States — benefiting not just these regions, but an interconnected world at large.

3. **Blue foods generally have a lower environmental footprint than terrestrial animal-sourced foods, and there are opportunities to further improve performance.**
Fed aquaculture of commonly farmed species — carp, catfish, tilapia, salmon, trout — has greenhouse gas and nutrient emissions and land and water use levels on par with chicken, the most efficient terrestrial source of animal protein. Environmental footprints can be reduced by shifting to lower-impact species. Unfed aquaculture — e.g., of bivalves and seaweed — generates negligible emissions and can improve water quality. CO_2 emissions of catching herring are one-fourth those of catching flounder. Improving existing systems can also help. The use of low-fuel gear, for example, can reduce greenhouse gas emissions in some fisheries by 61%. Reducing feed usage and switching to deforestation-free inputs can reduce emissions from aquaculture by half. Further management improvements are needed to tackle pervasive challenges like overfishing and excessive use of antibiotics.

4. Small-scale actors are the engine of blue food systems. Enhancing the resilience and environmental performance of their operations requires tailored consideration and support. Small-scale actors make up about 90% of jobs in fisheries and produce most of the blue foods destined for human consumption. Small-scale actors vary widely in their assets and capacities, degree of specialization and the challenges they face. Greater awareness of the range of small-scale actors can support appropriate policy and service development to advance adaptability.

Recommendations for Action

All actors — governments, the private sector and civil society — have roles to play at multiple scales, ranging from local initiatives to international agreements. Environment decision-makers might consider the following actions to realize the potential of blue foods:

1. Consider the impacts of aquatic pollution on blue food systems when evaluating policies, regulations and subsidies. Run-off of fertilizer, heavy metals, pesticides, plastics, sewage and antibiotics from cities and farms threatens the productivity of aquaculture and capture fisheries and the safety of the foods they produce. Investments in pollution reduction, monitoring and mitigation can safeguard blue food contributions to health, economies and culture.

2. Use environmental programs and regulations to improve practices and incentivize lower-impact production. Blue food production systems have the potential to be nature-positive, protecting ecosystems as they yield nutritional and monetary value for markets. Environmental policymakers can work with fisheries and aquaculture managers to reduce the environmental impacts of current production systems and to incentivize shifts to more sustainable systems,

and with actors along supply chains to create market infrastructure and consumer demand for more sustainable options.

3. Incorporate investments in blue food systems into national climate strategies. Fostering a shift toward blue foods and improving blue food practices can be important parts of climate solutions and Nationally Determined Contributions. National Adaptation Plans will also need to address the adaptation needs of blue food systems. They could focus on food system diversity — blue and green — as a source of resilience.

4. Explore opportunities to streamline regulations and financial services to promote access and innovation by small-scale actors. Exclusive, narrow or complicated environmental policies and regulations can act as a barrier to sustaining a diverse and adaptive small-scale sector. Actively including and empowering small-scale actors — including women, Indigenous communities and other marginalized groups — in environmental governance can improve the effectiveness of environmental policies and improve food system outcomes.

5. Integrate blue foods into river basin, coastal zone and ocean management. Blue foods are an important source of nutrition and employment, but the governance of fisheries and aquaculture is often isolated from the governance of natural resources, including watersheds and oceans. Improved coordination among agencies can help ensure that their policies support food security and livelihood outcomes that depend on aquatic ecosystems.

The Blue Food Assessment brings together over 100 scientists from more than 25 institutions around the world. The Stockholm Resilience Centre 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.

Photo credit: Hanson Lu

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