

A balanced approach to ocean and inland aquaculture will nourish the world

New research published in Nature Communications questions scientific and policy narratives around the potential of ocean aquaculture to solely contribute to food and nutrition security and environmental sustainability. It recommends a balanced approach that includes investing in existing aquaculture on land as the key to increase farmed aquatic foods in ways that contribute to the Sustainable Development Goals.



Image source: [Gallo/Getty](#)

The study suggests claims that aquaculture out at sea, particularly cage farming of high-value fish species such as salmon, has the potential to equitably nourish the world are overstated and have little likelihood of delivering affordable aquatic foods to those who need it most.

Policymakers and investors must acknowledge the current and future role of inland freshwater aquaculture and capture fisheries in improving the lives of those with the most acute sustainable development needs in low- and middle-income countries.

Many of the world's vulnerable people are dependent on fish and other aquatic foods harvested from ponds, lakes, rivers as well as oceans to support healthy diets and livelihoods.

Affordable, accessible nutritious food

The research calls for investment to be context-specific and oriented to inland freshwater aquaculture and coastal capture fisheries to underpin affordable and accessible nutritious food, particularly in emerging economies where demand is growing most.

Aquaculture is currently one of the fastest-growing forms of food production on earth. Most farmed aquatic foods originate from land-based freshwater production systems that are not as resource-constrained as often claimed.

Recently, growth in aquatic food production has occurred mainly through intensification rather than horizontal expansion, enabling higher levels of farm productivity using the same or less land and water.

Promoting marine aquaculture

The economics of offshore marine aquaculture require industrial-scale cultivation of high market value fish species to meet high production costs. This will promote the participation of large investors catering to consumers with high purchasing power.

By supporting a model of development based on the privatisation and exclusive use of oceanic resources, the drive to promote marine aquaculture feeds into a wider policy discourse of 'blue growth' with the potential to displace existing ocean users, most importantly fishers.

Coastal fisheries currently make extremely important contributions to the livelihoods and food and nutrition security of millions of people.

Nourishing the world

The paper's lead author, Dr Ben Belton, WorldFish value chain and nutrition senior scientist and associate professor at Michigan State University, said: "This research questions a growing narrative that offshore ocean aquaculture can sustainably nourish the world.

"Perspectives of low- and middle-income consumers who already rely on capture fisheries and inland freshwater aquaculture for healthy and diverse diets must be part of the discussion. Offshore marine aquaculture set-ups require large investments that preclude smaller producers from reaping the benefits and generate little employment. It won't feed the world alone as it is skewed toward 'luxury' finfish, which most consumers in low- and middle-income countries can't afford.

"Efforts to increase the production of farmed aquatic foods in ways that are compatible with achieving the Sustainable Development Goals through equitable and sustainable food system transformation must also focus on improving existing aquaculture on land, not pushing it far out into the oceans.

"The evidence suggests that inland freshwater aquaculture and marine capture fisheries have far greater potential to continue to supply most of the world's aquatic food and contribute to human equity and food security than offshore marine finfish farming. Policies and investments that seek to increase the availability and accessibility of affordable and sustainable farmed aquatic foods should look to the land."

Delivering affordable seafood

The study's co-author, Dr Dave Little, a Professor in Institute of Aquaculture at the University of Stirling, said: "Projections for mariculture, particularly offshore cage farming of high trophic species that are attracting the attention of investors and policymakers, is very unlikely to deliver affordable seafood for those who need it most.

"Many of the world's poorest people are particularly dependent on fish and other aquatic food in their diets and investment

is urgently required to ensure that they can maintain their nutritional security.

"Ensuring inland aquaculture continues to develop and underpin affordable and accessible nutritious food is critical, particularly in low- and medium-income countries where demand is growing fastest."

"The challenges around how inland aquaculture can continue to expand and remain sustainable, complementing other parts of the food systems and continuing to impact minimally on the local and global environment will require investment in R&D going forward."

Prioritising, transforming food systems

Another of the paper's authors, Dr Shakuntala Thilsted, WorldFish research programme leader for value chains and nutrition, said: "In response to global calls to transform food systems for healthy and sustainable diets, inland aquaculture and coastal capture fisheries must be prioritised.

"The ability to breed and farm freshwater fish at low cost using relatively basic technologies makes them accessible to low- and middle-income consumers in countries with high levels of supply, as well as to small- and medium-scale producers who benefit from farming them. Integrating fruit and vegetable crops in inland pond aquaculture can also improve climate-resilience and access to diverse diets."

[Read the full study.](#)

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