

Transforming climate-resilient aquatic food systems for shared prosperity

WorldFish at COP27

Sharm El-Sheikh, Egypt | 7-18 November 2022



WHY NOW?

Aquatic food systems are integral to building healthy and resilient communities worldwide. They offer an irreplaceable – and at times the most affordable – source of micronutrients, essential fatty acids and high-quality protein for vulnerable populations in many of the world’s lowest-income countries. More than one billion people rely on fish and other aquatic foods as their primary source of animal protein. Aquatic food systems are also key to sustainable livelihoods. Fisheries and aquaculture provide jobs, employment and income for millions, including women and young people. Around 60 million people worldwide work in aquaculture and fisheries and fish are among the world’s most valuable items of global trade, worth 164 billion USD in 2018.

However, the benefits of aquatic food systems continue to be underexploited despite offering enormous potential for addressing the unfolding climate crisis as well as reducing hunger and poverty. For communities most reliant on fisheries and aquaculture, climate-resilient aquatic food systems offer a meaningful chance to successfully adapt to new and challenging conditions. And by unlocking the opportunity for fair and equitable “shared prosperity” from the world’s oceans, rivers and lakes, climate-resilient aquatic food systems can also help deliver climate justice.

The world can – and must - transform aquatic food systems to become resilient to climate change. By 2050, we will need to feed more than nine billion people. Aquatic foods offer multiple entry points to accomplish this goal while also creating the conditions that allow climate vulnerable communities to thrive. Aquatic foods are highly diverse and tend to have much lower average resource use and environmental impacts than land-based animal-source foods such as beef and pork, presenting a route towards low-carbon food systems. With investment in management and innovation, aquatic foods can sustainably provide six times more food than they do today. This would be more than two-thirds of the protein needed to feed people in the future.

Climate-proofed aquatic food systems, including robust infrastructure and early warning systems, can also protect and increase the economic benefits for coastal and riverside communities. With greater resilience and a shared prosperity, fisheries and aquaculture offer new opportunities for the most vulnerable to participate on more equal terms, including women and young people.

Inclusive, diverse, and transformative aquatic food research and innovation that deliver on this promise are therefore more important than ever. These approaches have already been proven to drive climate adaptation and mitigation while ensuring benefits to communities worldwide. They generate productive and prosperous supply chains, equitable social and economic inclusion and improved nutrition and health.

At the COP27 climate talks, the world has an opportunity to fully realize and seize upon the game-changing potential of climate-resilient aquatic food systems for the world’s most vulnerable populations. As we convene in Sharm El-Sheikh, WorldFish brings the scientific evidence and existing innovations to make the case for putting aquatic food systems high on the climate agenda.



WHY WORLDFISH?

An international, non-profit research and innovation organization, WorldFish has worked for more than 45 years to provide scientific evidence to transform aquatic food systems. **WorldFish aims to provide nutritious food and livelihoods while protecting ecosystems.**

As it stands currently, fisheries and aquaculture-dependent communities are systemically disadvantaged. They are among the most at-risk for the impacts of climate change. Their access to technologies, and market and non-market services is limited. Predicting and responding to climate hazards is a continuous challenge for both communities and resource managers alike. At the same time, policy and investment to create and bolster livelihoods are lagging behind the need. Interventions often overlook local power structures, ultimately rendering them ineffective for aquatic food-dependent communities.

INNOVATIONS

To adapt to climate change and protect the lives and livelihoods of small-scale fishers and fish farmers, we must champion aquatic food innovations. The most exposed to the impacts of climate change are also those in greatest need of new tools, techniques and technologies. WorldFish is working to build climate resilience through aquatic systems across Asia, Africa and the Pacific, leveraging the diversity of aquatic foods to climate-proof the future for small-scale producers.

At COP27, WorldFish aims to ensure the future of aquatic food systems that support communities and ecosystems worldwide. To accomplish these big goals, WorldFish is:

- Putting transformative, diverse, scalable and inclusive research and innovations forward, especially where there is the largest opportunity for low- and middle-income countries.
- Engaging with representatives from governments, communities, research institutions, businesses, and civil society to build potential collaborations.
- Building understanding of aquatic food systems as holistic and transformative, demonstrating their intersection with food, land, water, nutrition, gender, youth, health, and more.

WorldFish's innovations are already making a difference, building climate resilience for the most vulnerable communities. From introducing low-waste water recycling systems to creating circular relationships between aquaculture and agriculture, new techniques and technologies foster cross-cutting impact for climate adaptation, nutrition, and livelihoods.

Delve into the different innovations in aquatic food systems that are making a difference across the globe.



BUILDING LIVELIHOODS

GIFT: Genetically Improved Farmed Tilapia (GIFT) has been selectively bred by WorldFish scientists to grow 85 per cent faster than other farmed strains without the need for commercial feed. Used for the last 30 years to help better address malnutrition and improve livelihoods, the latest strain launched in Egypt has shown a [36 per cent](#) lower impact on the environment compared to conventional breeds, thanks to more efficient feed utilization and higher productivity.

Rapid genomic detection of aquaculture pathogens: Diseases and pathogens in fish create waste in aquatic food systems and can be hard to detect. Rapid genomic detection of aquaculture pathogens allows for low-cost, fast, on-site pathogen detection. As a result, quick action can be taken to isolate and identify sick fish, preventing widespread losses and wasted resources while also maximizing livelihoods. Innovations such as these allow small-scale fishers and farmers to increase productivity and reduce losses without creating a greater environmental impact. These methods were developed by WorldFish and researchers at the University of Queensland and Wilderlab.

PESKAAS (Automated analytics systems for small scale fisheries in Timor-Leste): WorldFish has developed one of the most sophisticated data collection systems for small-scale fisheries in the world to track activities in Timor-Leste. This open-source online dashboard has highlighted previously unknown fishing areas, patterns and productivity. New levels of data can more accurately monitor fish stocks so they can be maintained to safeguard livelihoods and food security.



ADAPTING TO CLIMATE CHANGE

Climate-smart integrated agriculture-aquaculture systems: Integrated Aquaculture Systems (IAAS) is a circular approach that utilizes materials that would typically be wasted to nourish and support both agriculture and aquaculture. This leads to improved productivity for farmers. On one hand, manure can fertilize fish ponds and propagate plankton – fish food – while farm residues can be used to feed livestock. On the other hand, nutrient-rich water and mud from ponds can irrigate and fertilize crops respectively. By integrating small-and big-fish livestock, farmers diversify their products, becoming more resilient to climate change. It also facilitates access to all the key food groups at a household level, making nutritious diets more affordable. This innovation has been successfully launched in Zambia.

Climate information services: Despite progress in weather forecasting technology, fish farmers often cannot receive the climate information they need, when they need it. They face varying reliability, difficulties in delivery, and a lack of capacity, among other challenges. Together with partners, WorldFish worked to provide timely and reliable rich climate information delivered through a mobile app to local fish farmers in Bangladesh and build capacity to understand and apply the information to their operations. With the growing impacts of climate change, this type of information is critical to building resilience in aquatic food systems.



REDUCING EMISSIONS

Seaweed farming: With the livelihoods of many small-scale communities growing increasingly vulnerable due to climate change, WorldFish has supported seaweed farming as a nature-based alternative. Seaweed farming requires inexpensive infrastructure and minimal feed. Furthermore, seaweed farms absorb carbon and minimize food production emissions. Together with partners, WorldFish supported 400 coastal fisheries households through training.

In-pond raceway systems: The in-pond raceway system (IPRS) recycles water in a pond to create a water current, pumping out waste and reducing greenhouse gas emissions. This technology has been successfully deployed across Africa, the Middle East and North Africa (MENA), and Bangladesh. Increasingly important to these regions, IPRS has facilitated the growth of aquaculture to meet growing demands for nutritious protein sources.

Climate-smart fish processing systems: To help improve the sustainability of fish processing while reducing costs for small-scale producers, WorldFish collaborated with partners to develop climate-smart tools and methods. Briquettes, for instance, are blocks of organic waste for burning, but they can be expensive and harmful health-wise. In Malawi, WorldFish developed a technology that uses briquettes from agricultural leftovers, which, when used to smoke fish, uses less firewood and reduces the exposure of fish to bacteria. In Nigeria, WorldFish led an innovative project for solar tent fish drying. This climate-smart technology uses renewable and emissions-free energy, is easy to install and is economically viable. It can reduce post-harvest losses, create new value-added fish products, increase aquaculture supply chain actors' income and create employment opportunities, especially for women and youth.



IMPROVING NUTRITION

Small fish-based diets from capture fisheries and aquaculture: Aquatic foods are key to providing sustainable nutrition to some of the world's most vulnerable populations, however, access can vary. In Myanmar, WorldFish developed a dried fish powder using nutrient-dense fish to ensure healthy, affordable, consistent and sustainable food access as well as create new supply chain jobs. The powder can be stored for use even when fresh fish is scarce. Critical for remote and rural populations, it is easily transported as it does not require refrigeration.





We must place aquatic foods at the **center of the global research agenda** – one that has traditionally focused on land-based crops and livestock. With a **full representation of the food system**, the world can address the complex links that exist between food, land and water systems and **unlock an ocean of opportunities in an emerging, inclusive and resilient blue economy**.

– Essam Yassin Mohammed,
Interim Director General, WorldFish &
Acting Senior Director, Aquatic Food Systems, CGIAR



A CALL TO ACTION

Catalyzing change requires immediate and sustained action. This includes supporting research to inform policy and investment. It also means understanding barriers and opportunities to access innovations at community, national, and regional levels.

As the impacts of climate change grow, the world needs to build capacities of governments and institutions so they can respond effectively, as well as create a platform for stakeholders to share cost-effective, fair, and equitable strategies. WorldFish is undertaking all these necessary actions to build a better future in aquatic food systems.

With urgent transformation, aquatic food systems can drive climate action and sustainable development.

Not only can innovation in the aquatic foods sector provide a growing population with nutrition, but it can also reduce poverty, minimize negative environmental impacts, and advance equity for the most impoverished. WorldFish envisions a future where climate-resilient innovations, education, services, and markets are accessible to those who need them most – a future where institutions and governments are well-equipped to address climate challenges and the finance gap between investment and need is filled. Critically, WorldFish sees a future where communities are included in policy and investment interventions. Visit <http://www.worldfishcenter.org/cop27> to learn more.





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WORK WITH US

At WorldFish, we work with an extensive network of donors and partners to create change for the millions who depend on aquatic foods in the developing world. Partnerships are essential to bringing technologies and innovations to scale and achieve development impact. WorldFish's mission 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.

WorldFish partners with international, national, regional and local governmental institutions, universities, private sector organizations and non-governmental organizations.

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