Shetland mussels cooked on a BBQ © David Loftus

MSC INSIGHTS

BLUE FOODS: THE ROLE OF SUSTAINABLE SEAFOOD IN FOOD SYSTEMS

Key messages

- **Food system reform, a silver bullet?** Food production is a major driver of climate change, biodiversity loss, and diet-related disease. Many scientists and policymakers believe transforming the food system is part of the solution.
- **So what do we eat?** Leading scientists and policymakers have identified sustainably produced fish as an essential part of a better food system. The EAT-Lancet commission recommends two servings weekly, as does the World Health Organisation and many governments.
- **Why fish?** It has unique nutritional benefits and a smaller environmental footprint than many other animal proteins - good for people and planet.
- **Consumers are ready to change** – but confused: 43% of consumers report having changed their diets for environmental reasons, but many remain unsure whether eating fish helps or harms the planet[1].
- **More fish, at what cost?** Following the EAT-Lancet recommendation would mean increasing overall fish production. Farmed fish could cover most of the increase, but wild-caught will remain important and more than a third of fish stocks are currently overfished, with trends worsening.
- **Manage fisheries sustainably:** So if eating more fish can help solve climate change, protect biodiversity and reduce illness, managing fish stocks sustainably and stopping overfishing is essential.

[1] MSC global consumer perceptions study covering 23 countries worldwide, 2024

INTRODUCTION

Food production is a huge contributor to global carbon emissions and biodiversity loss. There is growing consensus among scientists and policymakers that food systems must be reformed to support both human and planetary health. Fish and seafood, when produced sustainably, are increasingly recognised as essential to this transformation.

This report summarises what the latest science says about the role of fish and seafood in healthy, sustainable diets. It explains the implications of recommendations for changes in consumption and production and makes the case that sustainable management of fish stocks is essential if governments follow these recommendations.

WHY FISH AND SEAFOOD IS BEING RECOMMENDED

The Planetary Health Diet (PHD) is a science-based dietary pattern developed by the EAT-Lancet commission, designed to optimise human and planetary health, and change the global food production system accordingly.

The diet recommends eating more vegetables, fruits, nuts, legumes and whole grains, paired with modest amounts of fish, poultry and dairy, with very limited red meat. The PHD recommends eating at least 30g of fish per day, or roughly two 100g servings per week, with flexibility of up to 100g daily depending on what other animal-based foods are consumed. But the EAT-Lancet Commission is clear: fish and red meat are not interchangeable and fish offers unique nutritional benefits that other animal proteins cannot match.

This echoes what many governments already promote, with an MSC review of government nutritional strategies showing that two portions per week is the most common recommendation.

Three major bodies of work now converge on this conclusion:

EAT-Lancet Commission (2025)

70 experts from 16 countries, building on the influential 2019 report, published in The Lancet.

UN FAO Blue Transformation (2022)

The UN's roadmap for growing aquatic food systems through a combination of fisheries management, sustainable aquaculture and reducing waste.

Blue Food Assessment (2021)

Over 100 researchers from 25 universities, the most comprehensive assessment of aquatic foods to date.

Tuna with mushrooms and Laoganma Sauce
© David Loftus

Health benefits

Unique nutritional value

Fish, shellfish and other aquatic foods are major sources of protein and essential nutrients for populations around the world, including in low- and middle-income countries and for young children. Small fish and bivalves are often overlooked but can be particularly nutrient-dense.

Seafood is the primary dietary source of omega-3 fatty acids (DHA and EPA), which are minimally present in land-based animal foods. Low omega-3 intake has been linked to slowed neurological development in childhood and may increase the risk of cognitive decline in adults. High intake is associated with reduced risk of cardiovascular disease. Most of this benefit is achieved at around 30g of fish per day – the basis for the Planetary Health Diet's reference value.

Fish is also rich in vitamin B12, vitamin A, iodine, iron, zinc and calcium. Nutrients from seafood are better absorbed by the body than those from vegetables or supplements, helping to deliver more nutrition per serving.

Environmental benefits

Compared with other animal protein sources, aquatic foods generate lower carbon emissions and have lower environmental impacts. Wild-capture seafood in particular requires no land, no freshwater, no fertilisers and no feed. For a planet under pressure, this matters.

If the goal is to protect biodiversity, why not simply stop fishing?

Some ocean campaigners argue that ending industrial fishing is a better way to protect the oceans than shifting to sustainable fisheries. A recent paper, "Biodiversity Consequences of Replacing Animal Protein From Capture Fisheries With Animal Protein From Agriculture"[2], tested this claim. Assuming demand for animal protein remains unchanged, it found that replacing fish with land-based livestock would likely harm global biodiversity.

Producing animal protein on land generally requires more space, feed and fertiliser than wild-caught fisheries – and typically more than aquaculture – driving deforestation, nutrient pollution, and biodiversity loss on land and at sea.

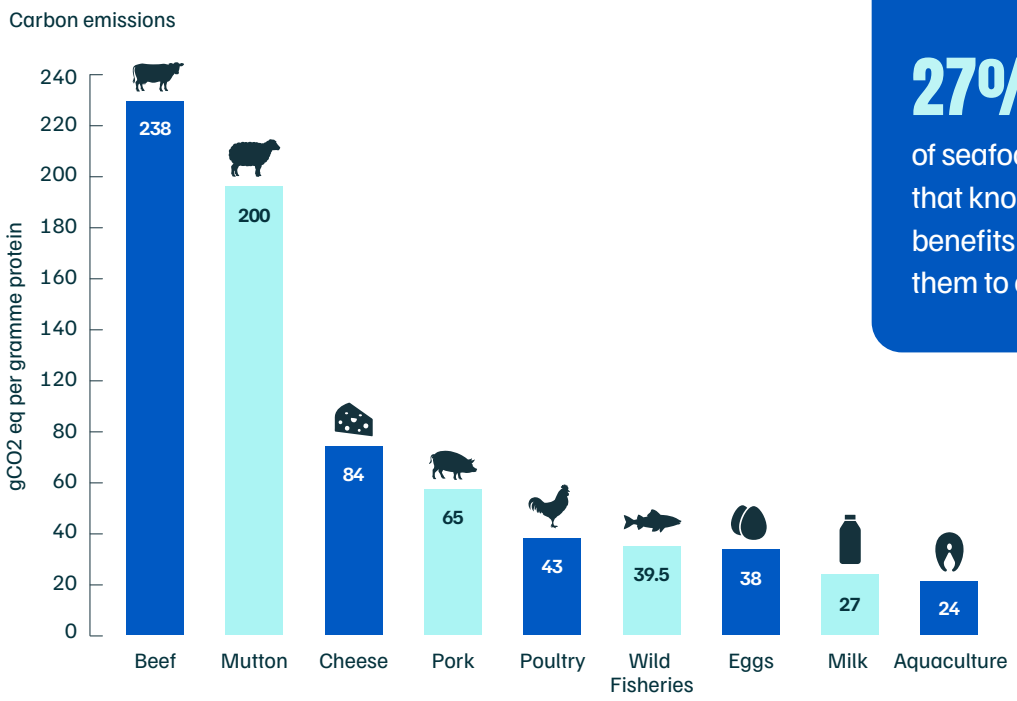
The paper did not model a scenario in which fish is replaced with plant proteins. However, the EAT-Lancet Commission report examined how diets could shift globally across food systems and did not recommend eliminating animal-sourced foods.

[2] *Leadbitter, D., Aebischer, N. J., Auchterlonie, N. A., Benton, T. G., Froehlich, H. E., Hall, S., Kaiser, M. J., Palme, U., & Hilborn, R. (2025). Biodiversity consequences of replacing animal protein from capture fisheries with animal protein from agriculture. Reviews in Fisheries Science and Aquaculture, 1–13. https://doi.org/10.1080/23308249.2025.2585414*

Carbon footprint

The carbon footprint of wild fisheries is a fraction of that of red meat. Per gram of protein, wild fisheries produce 39.5g CO_2 equivalent, compared with 238g for beef and 200g for mutton. Even poultry (43g) and cheese (84g) have higher emissions than wild-caught fish.[3]

Environmental performance of wild fisheries compared with other sources of protein.



Source: Oceana, Wild seafood has a lower carbon footprint than red meat, cheese, and chicken, according to latest data (2021)

Consumer voice

Consumers are prepared to change. MSC research shows that:

43%

of consumers globally have already changed their diets for environmental reasons.

27%

of seafood consumers said that knowing about health benefits would encourage them to eat more fish.

Land and water use

Wild fisheries require zero land per gram of protein, compared with 0.64 square metres for mutton and 0.49 square metres for beef. They also require zero freshwater, compared with more than 13 litres per gram of protein for pork and beef.

[3] *Gephart, J.A., Henriksson, P.J.G., Parker, R.W.R. et al. Environmental performance of blue foods. Nature 597, 360–365 (2021). https://doi.org/10.1038/s41586-021-03889-2*

Lowest-impact seafood

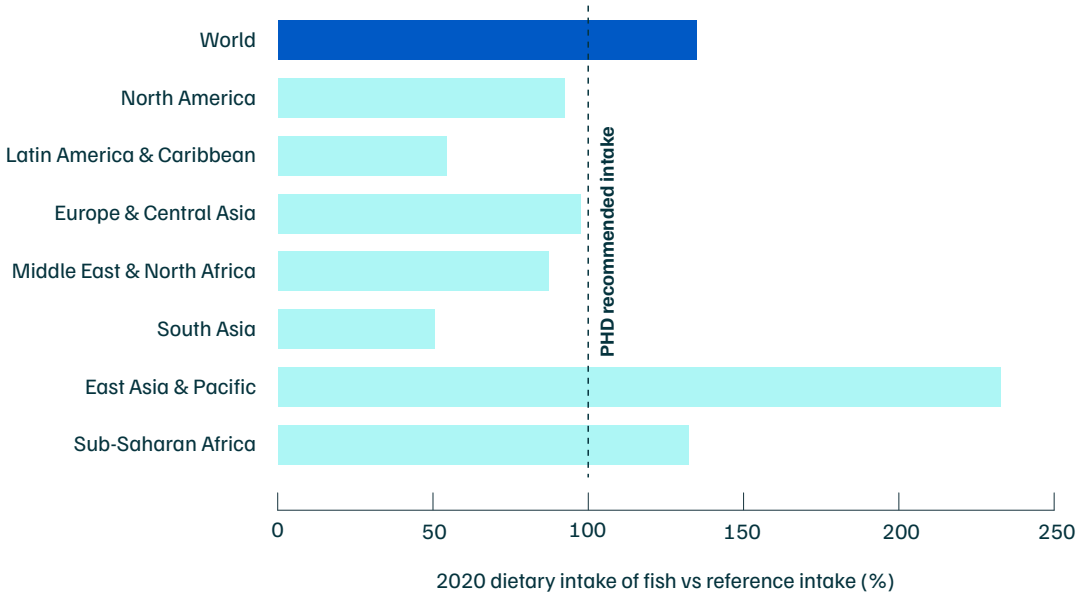
Seaweeds, bivalves (mussels, oysters, clams) and small pelagic fish (sardines, mackerel, herring) have among the lowest environmental impacts of all protein sources. Bivalves can even sequester carbon in their shells.

Mussels © MSC

Consumption gaps

Latin America and the Caribbean, and South Asia currently fall well below the recommended fish and seafood intake, with North America, the Middle East and North Africa, and Europe and Central Asia falling just below. These regional level measures will also be obscuring large variations between countries and populations. If the Planetary Health Diet is adopted globally, and everyone is to benefit from a healthy sustainable diet, these gaps will need to close.

Differences between adult fish consumption in 2020 and the planetary health diet recommended intake, globally and by region.



Governments around the world already recommend eating fish as part of a healthy diet, typically two portions per week, which aligns with the EAT-Lancet recommendation. Yet research that MSC conducted with independent insights and advisory consultancy GlobeScan across 23 countries found that only 19% of consumers said they were meeting this target and in some countries, the figure was as low as 7%.

These gaps between recommendation and reality suggest that clearer communication about the benefits of sustainably sourced seafood for human and environmental health is needed, as well as a nuanced discussion of the impact that price, access and taste also have when it comes to driving food choices.

Consumer voice

Health is the top driver of dietary change. MSC research found that:

64%

of consumers who changed their diets in the past two years did so "to be healthier."

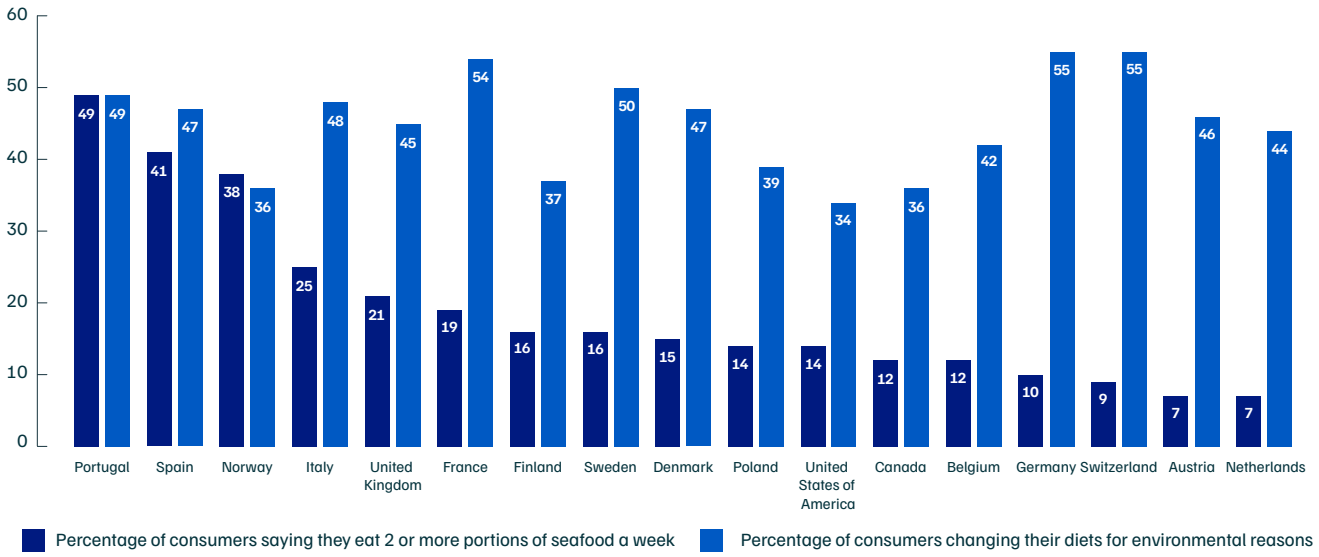
22%

of seafood consumers said that knowing about health benefits would encourage them to eat more fish.

43%

of consumers who changed their diet did so for environmental considerations.

Consumers weekly claimed seafood consumption and environmental reasons for changing diets.



WHAT DOES THIS MEAN? MORE FISH, PRODUCED SUSTAINABLY

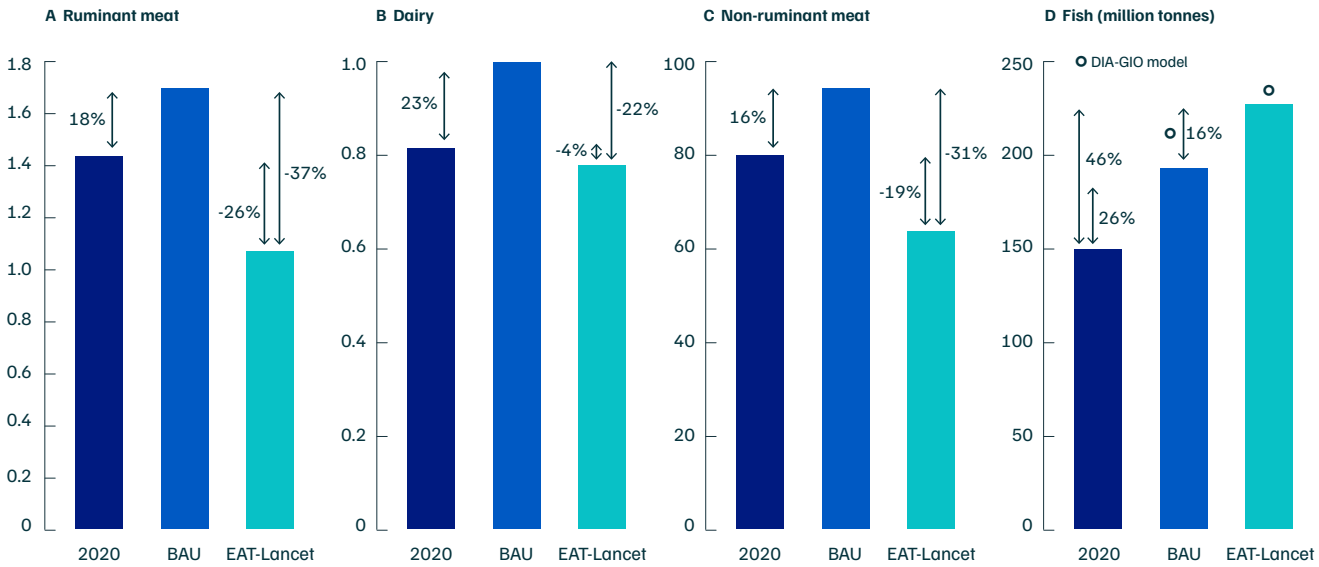
Increased demand and production

Already, 600 million people depend on aquatic foods for their livelihoods[4], and 3.3 billion people rely on seafood for at least 20% of their protein intake[5]. If governments listen to the science and shift food systems even some of the way towards what scientists and policymakers are recommending, this dependence will increase and demand for fish and seafood will rise faster than it is already doing.

The EAT-Lancet Commission says that if its diet is followed fully, global fish production will need to increase by 46% by 2050 compared to 2020 levels. Under business-as-usual projections, fish production is expected to increase by only 26% over the same period.

Where will this increase come from? The FAO and EAT Lancet expect growth in overall fish and seafood production to come from sustainable aquaculture, but wild-caught fish makes up around half of what is currently consumed and will continue to be an important food source, particularly in the global south and coastal communities. The relationship between aquaculture and wild fisheries must also be carefully managed, as currently a significant proportion of the feed for farmed fish comes from wild caught fish.

Projected changes in livestock and fish production under BAU and EAT–Lancet scenarios.



[4] UN FAO (2022) The State of Food Security and Nutrition in the World
[5] UN FAO State of Fisheries and Aquaculture (2022) (SOFIA) Report

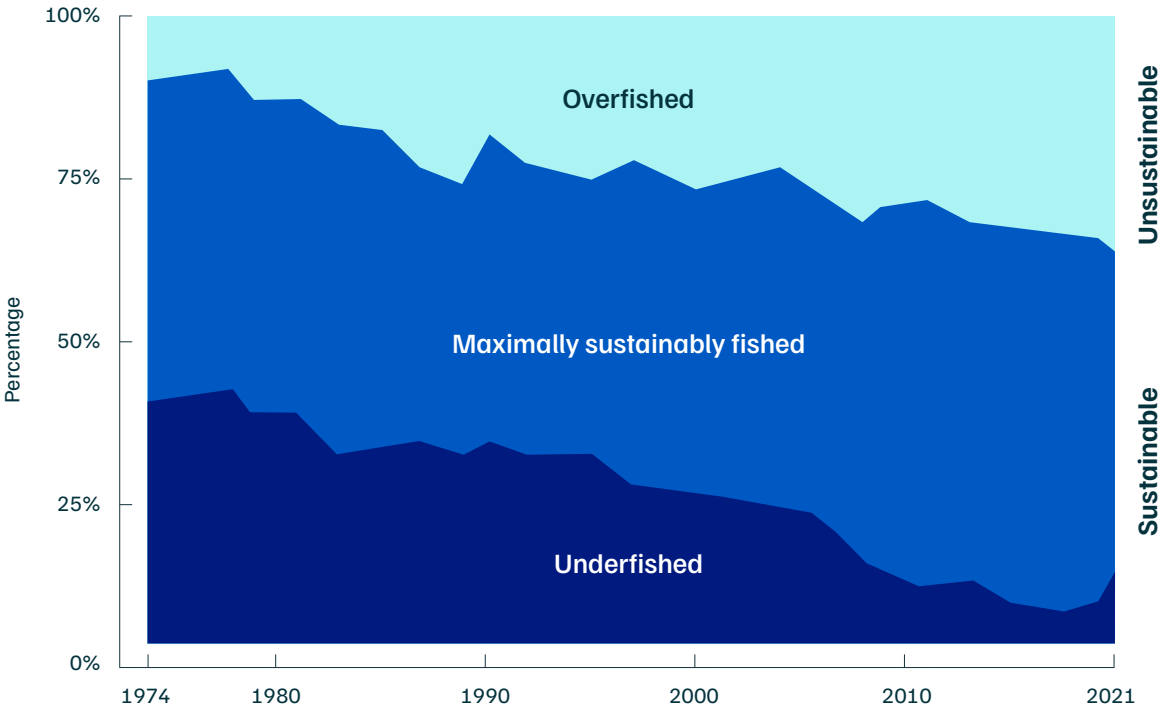
The stakes: overfishing and the risk to supply

Increased demand will place further pressure on fish stocks that are already stressed. Over a third of global fish stocks are fished beyond biologically sustainable limits. This proportion has been steadily worsening from around 10% in the 1970s and trends are continuing in the wrong direction.

Overfishing also has detrimental impacts on ocean ecosystems and fishing communities. Small-scale fisheries, which produce 40% of the global catch and account for 90% of fisheries employment worldwide, are particularly vulnerable. Their exposure to shocks from overfishing and climate change threatens their ability to provide food and livelihoods for millions.

The consequences of inaction are stark. Fish stocks can collapse, as happened with cod stocks in the 1990s, when catastrophic declines prompted the founding of the MSC and the development of the UN FAO Code of Conduct for Responsible Fishing. A critical source of nutrition and livelihoods is at risk. And if stocks are not managed sustainably, the dietary shift that science calls for simply cannot happen.

Overfishing trend chart – sustainable vs overfished stocks over time.



The opportunity: sustainable management works

The picture is not all bleak. Fish stocks can recover and provide seafood sustainably if managed carefully. Many fish stocks that were once overfished have been rebuilt through careful science based management, and the fisheries that target them are now certified to the MSC's Fisheries Standard. The UN suggests that 98% of currently overfished stocks could recover by mid-century with appropriate governance.[6]

[6] *United Nations. (2022). Fisheries (SDG 14.4 background paper). United Nations Department of Economic and Social Affairs. https://sdgs.un.org/sites/default/files/2022-05/ID_4_Fisheries.pdf*

Iberian Sardine Fishery © MSC

CASE STUDY: IBERIAN SARDINE, BACK FROM THE BRINK

Ten years ago, the Iberian sardine purse seine fishery was suspended from the MSC program because of challenges in stock management.

In 2021, the Spanish and Portuguese fleets came together, in the first collaboration between the two countries with the aim to rebuild stocks. They agreed on a multi-annual plan to restore biomass and ensure long-term sustainable management: an example of bilateral cooperation to ensure the sustainability of a vital fishing resource, adapting to scientific recommendations and seeking a balance between species conservation and the economic viability of the sector.

Fish stocks recovered, and in July 2025 the fishery was certified to the MSC Fisheries Standard. This achievement was made possible by the coordinated efforts of the entire value chain, including fishers, the processing industry and distributors.

Sardines, along with other small pelagic fish, are highly nutritious and have among the lowest environmental impacts of all protein sources. They can be eaten fresh or canned, contributing to their affordability and accessibility – factors of particular importance in the context of the current cost-of-living and food security crises. Increasing the availability of sustainably sourced sardines in the food system is an extremely positive outcome.

The prize: more fish, not less

Sustainable fisheries management does not mean catching less fish overall. If all global fisheries were managed sustainably, MSC's analysis has suggested that 16 million tonnes more seafood could be harvested every year.[7]

This additional catch could make a real difference to global nutrition. MSC analysis shows it could prevent iron deficiencies in 4 million people, calcium deficiencies in 24 million people, and provide enough omega-3 fatty acids to meet the daily requirements of 38 million people. In total, sustainable fishing could feed an additional 72 million people annually.[8]

[7] PNAS, Global fishery prospects under contrasting management regimes (2016)
[8] MSC, World missing out on nutrition for 72 million due to overfishing (2021)

Call to action

The science is clear: fish and seafood must play a greater role in healthy, sustainable diets. Fish and seafood consumption is projected to increase, and if governments follow the latest scientific recommendations this increase will happen even faster. It is vital that this need for more food does not come at the expense of our fish stocks, or our planet and its biodiversity, as was the case after World War II, when speedy industrialisation of the food system drove many fish stocks to the brink of collapse.

Fish stocks must be managed sustainably, in line with scientific advice. Different stakeholders have different roles to play.

Governments and policymakers must:

- Integrate sustainable management of fisheries into national nutrition, food security, climate change and biodiversity strategies.
- Set and enforce science-based catch limits on all fish stocks and collaborate to manage shared stocks.
- Support and incentivise small-scale and developing world fisheries in the transition to sustainability, by filling gaps in funding, capacity, data and knowledge.
- Engage in science-based management, take measures to understand the health of fish stocks and impacts on biodiversity, and mitigate these.

Consumer voice

Consumer demand supports this direction. MSC research shows that:

55%

of seafood consumers globally say seeing the MSC ecolabel would make them more likely to purchase a product.

53%

are prepared to pay more for products from certified sustainable fisheries.

However, not all consumers understand that fish and seafood can be a good choice for the planet if sustainable. There is evidence that younger consumers do not know fish can be produced in a sustainable way and so are avoiding it all together. 18–34-year-olds are the most likely age group to claim to take action on ocean protection, including stopping or reducing seafood consumption.

For industry – retailers, brands and food service:

- Commit to sourcing from sustainable fisheries to incentivise fisheries to operate sustainably.
- Use credible science-based tools such as the MSC Fisheries Standard, to inform sourcing decisions.
- Integrate sustainable fish sourcing into actions to promote healthy eating, and reduce impacts on climate and biodiversity.
- Promote the role of sustainable fish and seafood in diets that are good for human and planetary health, so that consumers looking for win-win options are informed.

For fisheries:

- Work towards meeting independent, science-based standards for sustainable fishing such as the MSC Fisheries Standard.

For the general public:

- Seek out sustainable sources of fish and seafood using reliable science-based certification schemes and ratings as a guide.
- Ask supermarkets, fishmongers and fishers about the sustainability of the fish they are selling.
- Hold governments and policy makers accountable for managing fisheries sustainably.

A framework for progress

Certification programmes like the MSC provide a credible science-based framework for verifying sustainable fishing practices and meeting consumer expectations. Currently, 20.6% of the world's wild marine catch is engaged in the MSC program, with more than 20,000 certified products available worldwide.

But more progress is needed. MSC's goal is for fisheries responsible for a third of wild seafood to be engaged by 2030.

Sustainable fishing is an attainable goal. It requires collective action from governments, industry and fisheries, and it is supported by growing public demand. The scientific and policy community has spoken. The question now is whether we act on their guidance.

Female fisher gathering clams at Bến Tre clam hand gathered fishery © DavidVisuals