

Media briefing

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Subsidies that drive overfishing also hamper fight against climate change

Tens of millions of tonnes of carbon-rich fish faeces are being taken out of the ocean carbon cycle every year as overfishing disrupts fragile ecosystems.

This briefing was created in partnership with the University of British Columbia's Fisheries Economics Research Unit.

The story in brief

Fish play an important role in cycling nutrients, including climate-warming carbon, in the ocean. They consume plankton, algae, smaller fish, and so on, before passing on the byproducts through excretion and respiration, and in their bodies when they die.

Scientists believe fishes' faecal pellets are among the most efficient ways of burying carbon in the seabed, where it can stay [for as long as 600 years](#). That means overfishing and, by extension, the economic structures that enable it, can have a big effect on the sea's ability to store climate-warming carbon by reducing the number of pellets produced. The kinds of fish most commonly caught [are thought to be among the biggest cogs in this machine](#).

Fisheries subsidies fall into three broad categories according to their effects on fish stocks and people's livelihoods: harmful, beneficial and ambiguous. Harmful subsidies artificially increase the profits of fishing by reducing costs or increasing revenues, and are a major driver of overfishing. Examples include subsidies for building boats, cheaper fuel and tax breaks.

Last year, negotiations at the World Trade Organisation (WTO) produced [a high-level agreement on ending some harmful subsidies](#), but it has not yet come into force because [not enough member countries](#) have formally adopted it. This week, WTO fisheries negotiations will continue at a ministerial conference in Abu Dhabi.

In 2018, the most recent year for which complete data is available, the large-scale or industrial fisheries sector [received US\\$18.4 billion in harmful subsidies](#) (2018 dollars). And between 2015 and 2019, the annual average fish catch in the industrial sector was [69.1 million tonnes](#). This means each dollar of subsidy contributed to landing about 0.0038 tonnes (3.8kg) of fish.

It's estimated that a tonne of the kinds of fish targeted by fisheries [can ingest and process five tonnes of biomass per year](#), and that one-fifth of this cycled biomass is converted to faecal pellets. Multiplying our dollar's worth of fish by five to find its biomass-cycling potential, then dividing by five for its faeces production, we arrive at a figure of 3.8kg of faecal pellets per year not produced per dollar of harmful subsidy.

This means these payments could be preventing up to 69 million tonnes of carbon-rich fish faeces per year from contributing to long-term carbon storage, acting as a hidden handbrake on efforts to tackle climate change.

At a time when the world is trying to cut carbon emissions and restore carbon sink capacity, it's even more important that governments confront the damage being caused by harmful subsidies. This money should be redirected in ways that makes sense for people and the planet, to benefit current and future generations.

The calculations presented here are approximate because not all large-scale catch can be attributed to harmful subsidies. Nevertheless, we have focused on the large-scale sector because it receives the biggest subsidies.

While experts agree that fish are key transporters of carbon, the details of this cycle have not been fully quantified, nor the contributions of specific species. Data on the carbon content of faecal pellets is patchy, making it extremely difficult to find the precise weight of carbon that could have been captured by the droppings of fish caught thanks to harmful subsidies.

Our analysis includes only weight of faecal pellets and not the additional carbon-rich matter that would have been moved to the deep ocean by fish continuing their lifecycles until dying.

The background

Perverse economic incentives help underwrite climate-damaging industries around the world including fossil fuel production and industrial farming [that feeds our appetite for ultra-processed food](#). In this instance, we've looked at how taxpayer money is being used in ways that promote unsustainable fishing practices.

Researchers and conservationists have long agreed that [overfishing has negative consequences](#) for the health of our oceans and the socio-economic wellbeing of coastal communities. As voracious human appetites disrupt the natural order of marine life, entire fish populations can collapse, as cod did in the northwest Atlantic about 30 years ago.

The approach of catching as much fish as possible is simply not sustainable: this means that nature cannot replace its losses and, by extension, that humans risk losing key sources of food if this activity continues.

This disruption [may also make some ecosystems less resilient to climate change](#) and drive some species to extinction, experts believe. At the same time marine fisheries are heavily reliant on climate-heating fossil fuels, much of which is subsidised. Globally, fishing vessels emit [as much as 200 million tonnes of carbon dioxide a year](#), while harmful subsidies [are linked with increased CO2 emissions](#).

Harmful subsidies are one of the key drivers of overfishing because many operations would be unprofitable without them. These incentives [also favour bigger, industrial-level operations](#), tipping the scales in their favour while disadvantaging the small-scale fishers who target fish for local consumption.

Last year's WTO agreement on fisheries subsidies will, when formally adopted by enough countries, ban subsidies for illegal or unreported fishing activity; when fish stocks in an area are found to be too low; and unregulated fishing in international waters.

But the current agreement is very narrow. Negotiations this week will tackle the subject more broadly and it is vital that governments take the opportunity to show harmful subsidies can be repurposed and redirected to support positive activity. This could include helping fish populations to recover – restoring the vital carbon-capturing capacity that has been lost – and [supporting vulnerable coastal communities](#) to engage in fisheries management.

The numbers

The harmful subsidy figures used in this analysis are from 2018 and are the most recent, accurate and complete numbers available. They are based on [a paper in *Marine Policy*](#) from November 2019 and [further analysis in 2020](#). Figures for the amount of fish caught come from [SeaAroundUs](#), a project of the University of British Columbia, and are also the most recent available.

Figures used in the calculation of fishes' biomass cycling potential were drawn from [a 2021 paper in *Science Advances*](#).

Below are tables showing the proportion of catch and subsidy attributable to large- and small-scale fisheries, as well as the top 10 national providers of harmful subsidies to the large-scale fisheries sector.

Breakdown of total global catch and subsidies by industrial (large-scale) and small-scale sectors. Catch = average annual catch for 2015-2019

	Global	Large scale	Small scale
Catch (000 t)	96,941	69,060	27,880
Harmful subsidies (million US\$)	22,247	18,355	3,892

Top 10 countries providing industrial harmful fisheries subsidies

Country	Harmful subsidies (in million 2018 US\$)	Percentage of global industrial harmful subsidies (%)
China	5,615	31
Japan	1,242	7
South Korea	1,205	7
Russian Federation	1,142	6
USA	918	5
Thailand	958	5
Taiwan	662	4
Spain	667	4
Norway	410	2
Indonesia	363	2
Global total	18,355	

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