THE GLOBAL FISHING INDEX 2021

Assessing the sustainability of the world's marine fisheries

MINDEROO FOUNDATION

About

Established by Dr Andrew Forrest AO and Nicola Forrest AO in 2001, Minderoo Foundation is proudly Australian. One of the Asia Pacific's largest philanthropic organisations, we have committed AU$2 billion to a range of global initiatives.

The Global Fishing Index is a project of Minderoo Foundation's Flourishing Oceans initiative, which aims to restore the ocean to a flourishing state by advancing ocean conservation, generating knowledge about the marine environment and ensuring all fisheries operate sustainably and responsibly.

A critical step towards this goal is to improve our understanding of the state of fisheries around the world – to better identify bright spots and management gaps, discover and share solutions, and increase the accountability of those responsible for fisheries and seafood supply chains.

The Global Fishing Index provides a snapshot of current fisheries performance and will be updated every three years. The next version will be released in 2024.

Data statement

Visit www.globalfishingindex.org to explore the data behind the Global Fishing Index.

All country-level results are available for download at www.globalfishingindex.org. Additional detail is available by contacting globalfishingindex@minderoo.org.

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Trawler fishing for herring in the English Channel - Calais, France Photo credit: Christian Aslund / EyeEm via Getty Images

CONTRIBUTORS

Minderoo Foundation

Dr Kendra Thomas Travaille, Dr Asha McNeill, Dr Julia Santana Garcon, Jemma Turner, Megan Cundy, Alex McLennan, Abiyoso Purnomosakti, Vyvyan Summers, Fiona David and Dr Tony Worby.

Research partners

We worked with the Sea Around Us initiative and Quantitative Aquatics, Inc (Q-quatics) to produce country-level stock sustainability and data availability metrics. The Sea Around Us is a research initiative at The University of British Colombia and The University of Western Australia. Their work focuses on assessing the impacts of fisheries on marine ecosystems and developing solutions for stakeholders. Q-quatics is a non-profit organisation that supports the assembly and dissemination of key data on living aquatic resources.

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Expert advisory panel

Dr Dyhia Belhabib, Dr Phillipa Cohen, Martin Exel, Dr Rod Fujita, Dr Elizabeth Fulton, Charles ("Chuck") Fox, Dr John ("Jack") Kittinger, Dr Katie Longo, Dr Tom Pickerell and Prof Rashid Sumaila

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Editor, Minderoo Foundation

Dr Shanta Barley

Production, Minderoo Foundation

Benjamin Horgan

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Black cormorant feeding on bait fish - Sea of Cortez, USA
Photo credit: wildestanimal via Getty Images

FOREWORD

Peter Thomson
UN Secretary General's Special Envoy for the Ocean

There is no healthy planet without a healthy ocean, and the latter's health is measurably in decline. One of the greatest tasks of our times is to reverse that decline and restore the good health of the ocean. We can do it, of that I am sure, but we must prevaricate no further. Our children and grandchildren's future security demands that we take action now.

In my role as the Special Envoy for the Ocean, I am focused on implementing the universally agreed targets of Sustainable Development Goal 14 (SDG14), to conserve and sustainably use the ocean's resources. These targets include a demand that we effectively regulate harvesting of these resources, end overfishing, illegal fishing and destructive fishing practices, and implement science-based management plans, in order to restore fish stocks in the shortest time feasible. How are we doing on that? This report makes it very clear we are not doing well.

Minderoo Foundation's Global Fishing Index shines a bright light on the scourge of overfishing. Highlighting the situation in 142 countries, it challenges all of us to up our game in the implementation of SDG target 14.4. It is a call to action to all countries to tighten controls and eliminate the drivers of overfishing once and for all, so that we can ensure a healthy, bountiful ocean for future generations.

We know that where fisheries are effectively managed, stocks are above target levels or rebuilding, and that the converse is also true. As the United Nation's Food and Agriculture Organisation affirms, management is the best form of conservation.

I commend this report to all those interested in safeguarding the sustainability of the ocean's fish stocks and thank the Minderoo Foundation for their commitment in producing this Global Fishing Index for the benefit of us all.

Peter Thomson
UN Secretary General's Special Envoy for the Ocean

Yellowtail snapper
Photo credit: Stephen Frink via Getty Images

CHAIRMAN'S MESSAGE

I am incredibly proud to present this first edition of Minderoo Foundation's Global Fishing Index.
But I am also deeply saddened by its findings.

The world's fish stocks are in a dire state, far worse than previously thought. Half of the world's fish stocks, of those that we have data for, are overfished.

But this is only part of the picture. For many stocks, we have little or no data. In 89 countries, over half of fish caught comes from 'unassessed' stocks. These stocks could be healthy – or overfished.

We just do not know. The data is not there.

It gets worse: 100% of coastal fish stocks are unassessed in 29 countries – many of which have local communities who depend on these fisheries for livelihood, food and nutrition security.

The reality is that countries continue to target already-overfished stocks, and blindly exploit stocks they know next to nothing about. Eight per cent of fish stocks globally are on the brink of collapse – with less than 10 per cent of their pre-fishing population left.

The Global Fishing Index (the Index) is a major step towards recognising these problems, and turning them around.

The Index is the largest assessment of fish stocks to date – an unflinching analysis of 142 countries. Combining data on stock health and governance, we give each country a grade of 'A' through to 'F'.

Most countries are a fail.

Just six countries get a 'C' grade – just scraping a pass. The vast majority (over 80 per cent) including important fishing countries like China, Russia, Japan, Indonesia and Peru, get a 'D' or 'E'. For a country so proud of its ocean, my own home country – Australia – gets a 'D', with 38 per cent of our assessed stocks classified as overfished.

Without real and genuine action, the commitments we have made to the United Nation's Sustainable Development Goal target 14.4 to end overfishing are nothing more than hollow promises.

Governments around the world have not only missed the target, the problem is getting worse.

We are not on a pathway to a sustainable, healthy ocean. We are not on a pathway that will support the food, nutrition and livelihood needs of billions of people into the future.

One critical challenge in fisheries management is the assumption that it is 'acceptable' to fish down stocks to just 40 or 50 per cent of their historic, unfished levels. While we used this single-species approach, we strongly believe a revolution in thinking – and management – is needed.

We must move away from single-focus thinking, towards an ecosystem-based approach. This is critical if we are to ensure the health of fish stocks in the face of the current climate crisis affecting our planet.

My message to the governments, companies and their shareholders that are driving the devastation of our ocean is clear: allow your fisheries to slide further and further toward collapse, to the detriment of your people and pocketbooks. Or, change now, so that we can celebrate you in our next edition of the Global Fishing Index.

We are just getting started.

Dr Andrew Forrest, AO
Chairman – Minderoo Foundation

Fishing boats set sail in the morning to the East China Sea for fishing on September 17, 2021. - Zhoushan, Zhejiang Province of China
Photo credit: VCG / Contributor via Getty Images

EXECUTIVE SUMMARY

Over the past 50 years, the world has witnessed a massive decline in the health of its fisheries.[1] Quite simply, we are removing fish from the ocean at a far greater rate than they can naturally replenish.

Overfishing, driven by poor management, illegal and destructive fishing and an ever-expanding fishing fleet, has diminished fish populations to unhealthy levels, and there is little sign of recovery.

Marine fisheries provide millions of people with an income, food and nutrition, and without healthy fish stocks and marine ecosystems, the planet and future populations will suffer. But the ocean and the livelihoods of the millions of people who depend on it are being destroyed.

In response to this crisis, global leaders set a target to end overfishing and restore fish stocks to sustainable levels of abundance by 2020 as part of the United Nations' Sustainable Development Goals (SDG target 14.4). However, we are still far from achieving this goal, and many fisheries continue to operate with little oversight – making it impossible to measure, monitor or manage fisheries toward this outcome.

The Global Fishing Index (the Index) addresses this challenge by providing the most-comprehensive assessment of the state of fisheries to date and connecting this information with decision-makers to drive global change.

The Index brings together data on the status of 1,465 fish stocks, across 142 countries, with total national catch and new information about how fisheries are governed in each country to report for the first time on country-level progress toward SDG target 14.4.

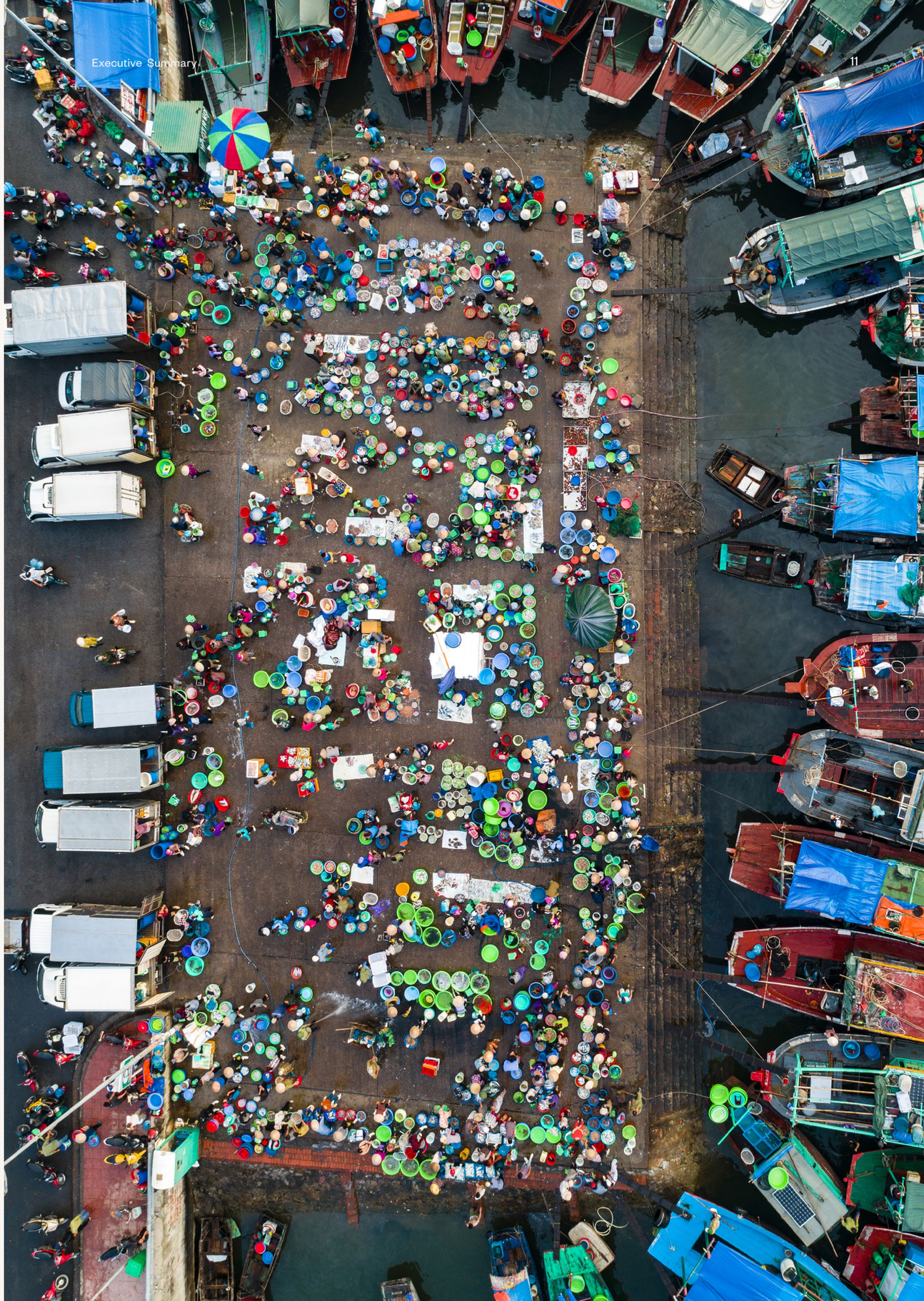
But we don not want to just call out problems. We also provide practical country-level recommendations for governments and businesses to help reverse fisheries decline and protect and restore the health of the ocean.

Key findings:

Urgent action is needed to achieve sustainability goals, including SDG target 14.4.

We find that:

1. Collectively, countries are not delivering against global fisheries sustainability commitments.
2. Just over half of the global fisheries catch lacks sufficient data to determine its status.
3. 49% of assessed stocks are overfished - with nearly 1 in 10 stocks on the brink of collapse.
4. Most fisheries lack science-based management, which is essential for sustainability.
5. Vital stakeholders, including local fishing communities, are unable to effectively participate in fisheries management.

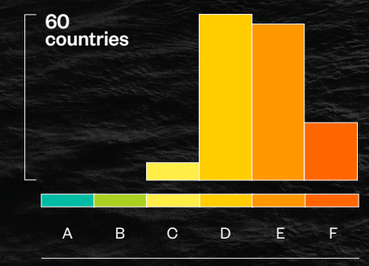


Fish Market - Ha Long, Viet Nam
Photo credit: Nguyen Duc Thành/ EyeEm via Getty Images

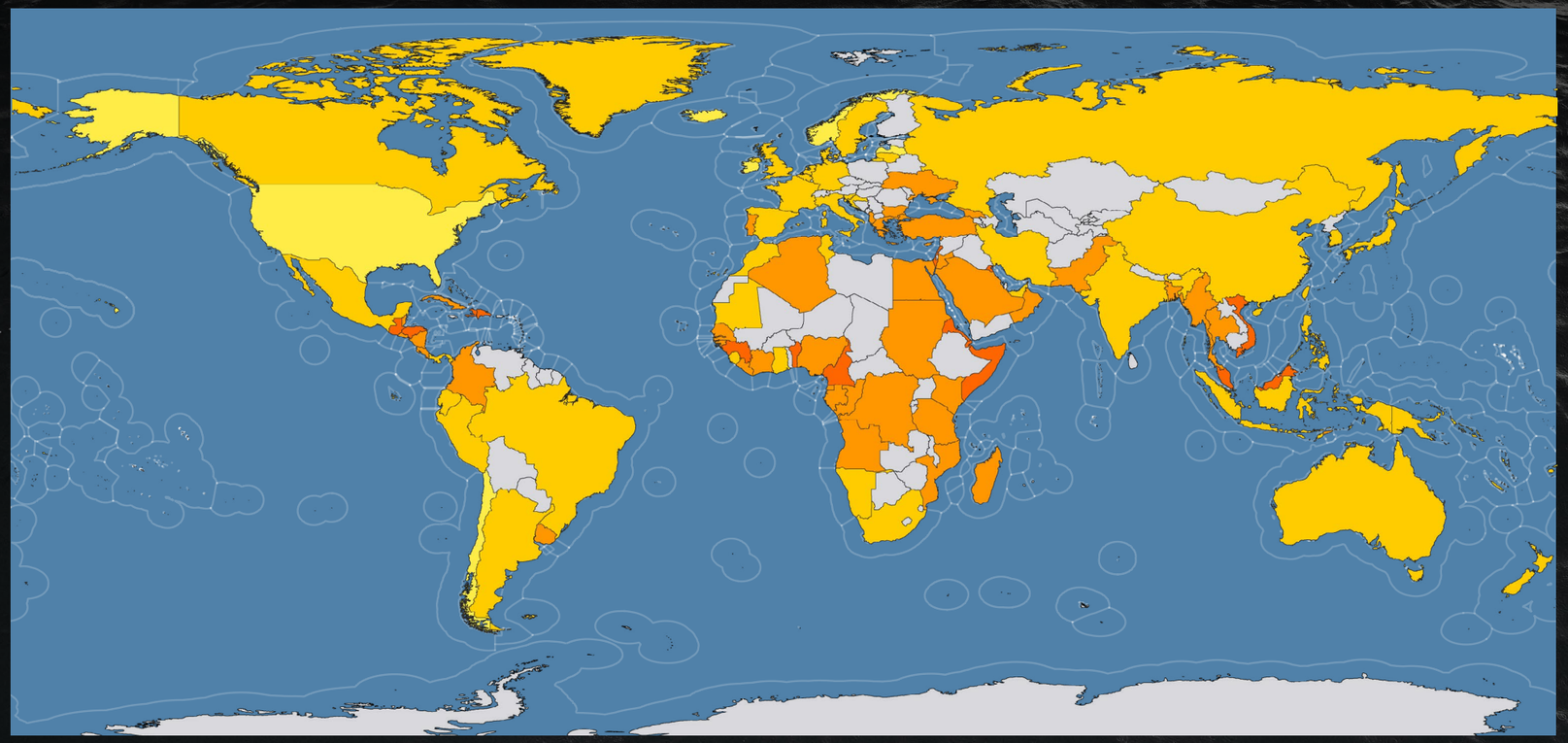
COLLECTIVELY, COUNTRIES ARE NOT DELIVERING AGAINST SUSTAINABILITY GOALS.

Of 142 countries assessed, no country achieves an ‘A’ or ‘B’ grade.

Only six countries receive a ‘C’ grade – having demonstrated some progress to restore fish stock health and governance capacity to keep improving. Alternatively, 20 countries receive an ‘F’ grade, as nearly all fish stocks are unassessed or overfished and there is little prospect of improving without substantial investment in fisheries governance and management.



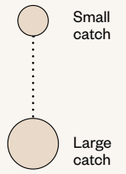
OVERALL GRADE



Based on current progress and the governance systems in place, we find that – without significant improvements, there is little prospect for achieving sustainable fisheries in most countries.

21 of the 25 countries with the largest total marine catch in their national waters get a ‘D’ grade or lower.

Progress score and governance capacity of the top 25 producers of marine catch. Size of circle indicates catch volume (tonnes). Colours indicate overall grade received, based on a country’s progress towards restoring fish stocks and governance capacity.



Overall grade

Non GFI country

Exclusive Economic Zones

Photo credit: Getty Images

ONLY 48% OF THE TOTAL GLOBAL CATCH HAS SUFFICIENT DATA TO DETERMINE ITS STATUS.

We find that:

48
countries have assessed less than 25 per cent of the total marine catch in national waters.

68
countries have assessed less than 10 per cent of their nationally managed catch.

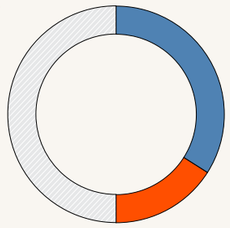
29
countries have not assessed a single national or shared stock.

OF 1,465 ASSESSED STOCKS, 49% ARE OVERFISHED.

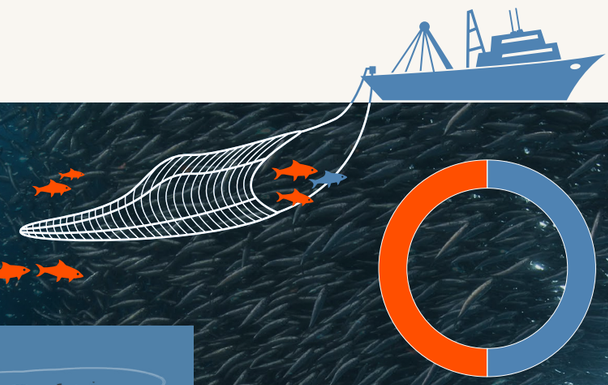
Catch Sustainability*

- 52% Unassessed
- 32% Sustainable
- 16% Overfished

**Status of total marine catches since 1990*



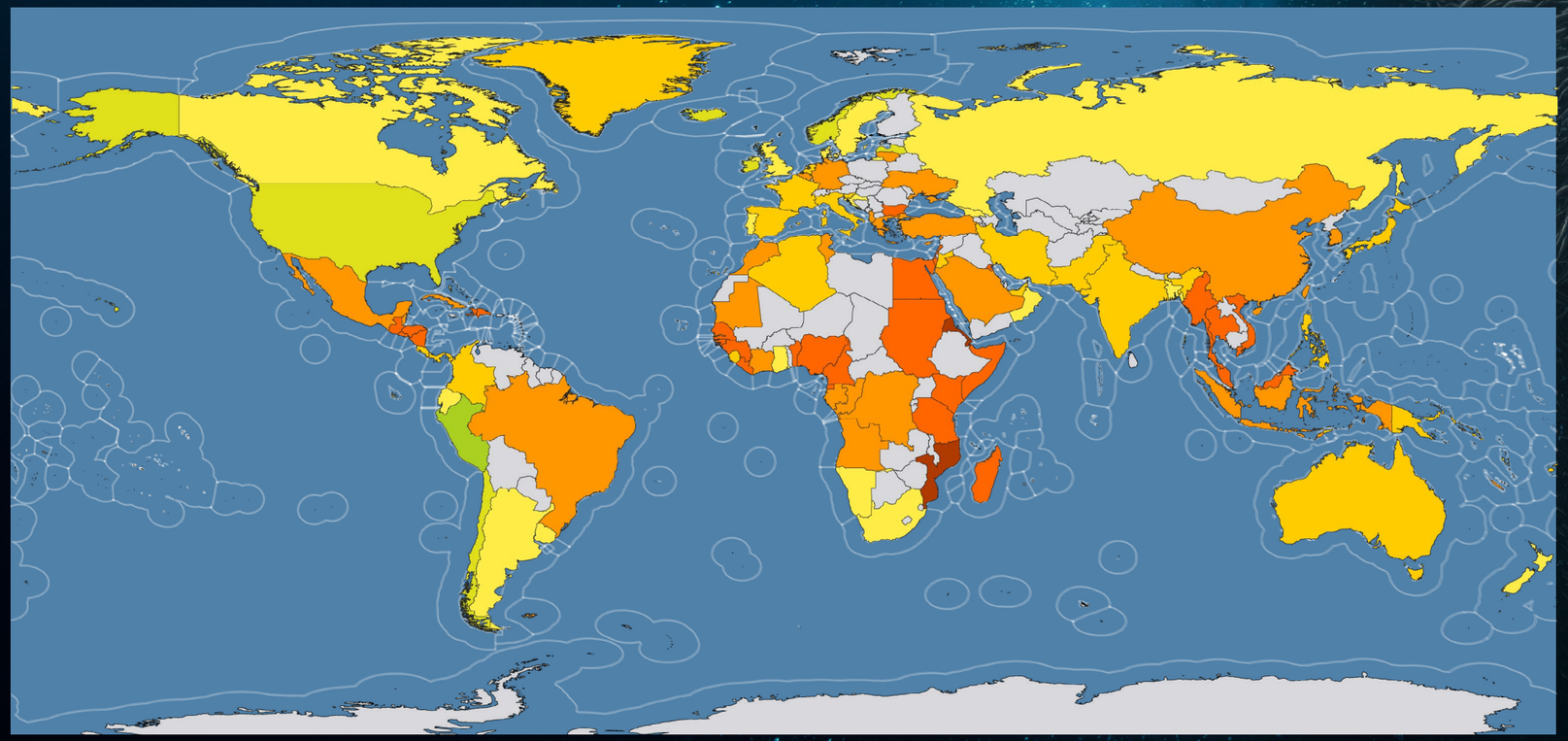
1 in 3 fish caught is from a sustainable stock



Stock Sustainability

- 49% Overfished
- 51% Sustainable

PROGRESS SCORE



NEARLY 1 IN 10 STOCKS HAS BEEN DRIVEN TO COLLAPSE

Progress score

<1 | 1–10 | 11–20 | 21–30 | 31–40 | 41–50 | 51–60 | 61–70 | 71–80 | 81–90 | 91–100

Non GFI country | Exclusive Economic Zones

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School of Sardines - Philippines
Photo credit: Mathieu Meur via Getty Images

COUNTRIES ARE NOT APPLYING SCIENCE-BASED MANAGEMENT IN MOST OF THEIR FISHERIES.

WHAT COUNTRIES NEED TO DO:

Step 1
Set fisheries objectives

- 22 countries lack environmental sustainability goals for fisheries
- 10% of countries lack economic, environmental and livelihood objectives for fisheries

Step 2
Collect high quality data

- 20% of countries do not require fishers to report catch or effort data
- Nearly 50% of countries do not independently verify reported information or enforce reporting requirements

Step 3
Analyse data to monitor impact

- Almost 40% of countries do not formally assess most of their fish stocks
- 36 countries do not use a quantitative stock assessment model in their most valuable fishery

Step 4
Develop evidence-based management

- Only 46% of countries apply science-based catch or effort limits in more than a few fisheries
- 21 countries do not apply science-based catch or effort limits in any fisheries

Step 5
Use data for decision making

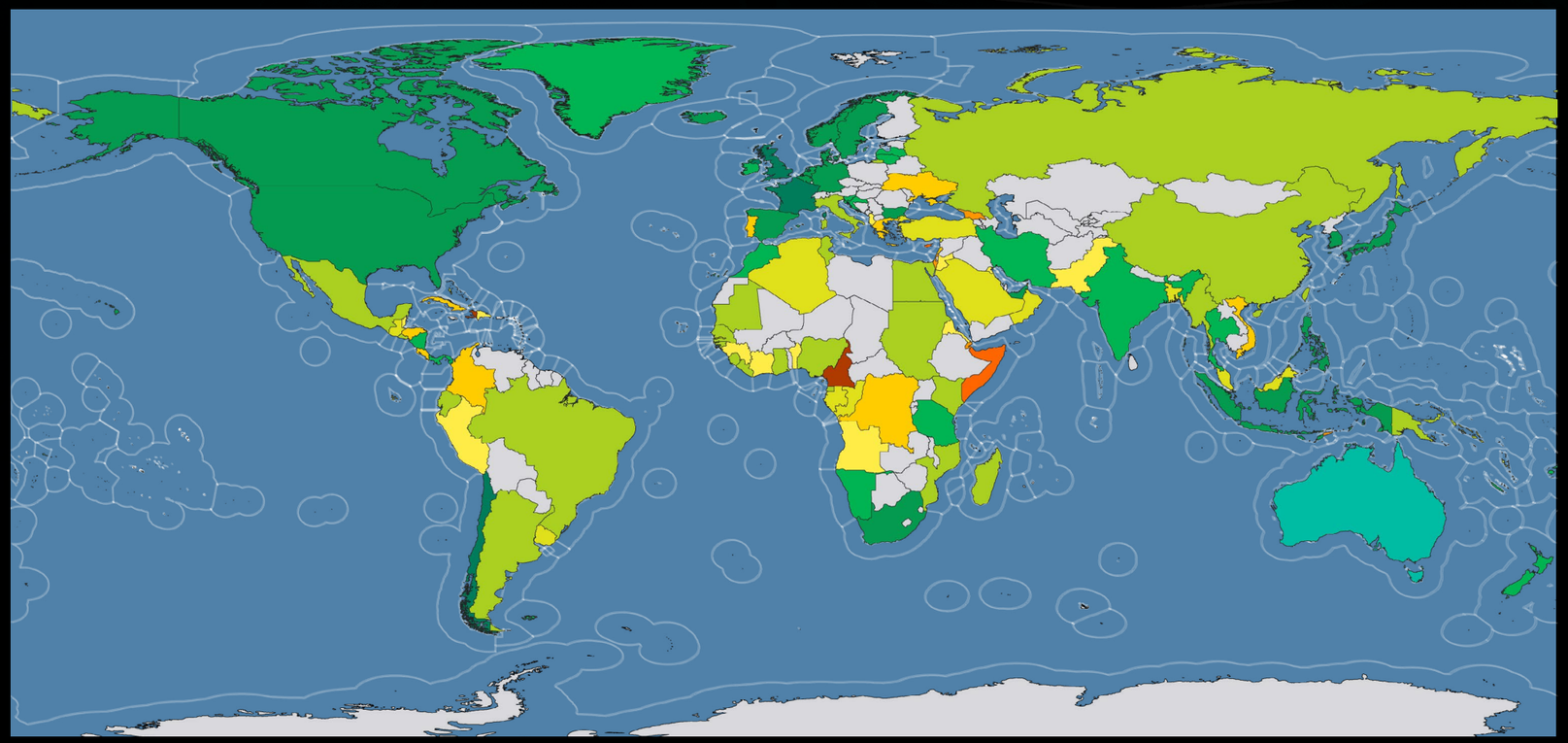
- Only 41% of countries have harvest control rules in their most valuable fishery
- 1 in 4 countries lack a strategic plan for achieving fisheries objectives

Step 6
Monitor compliance and outcomes

- 27% of countries do not consistently conduct planned fisheries inspections
- Bribery and corruption are considered common in 1 in 4 countries

Step 7
Review policy settings

GOVERNANCE CAPACITY

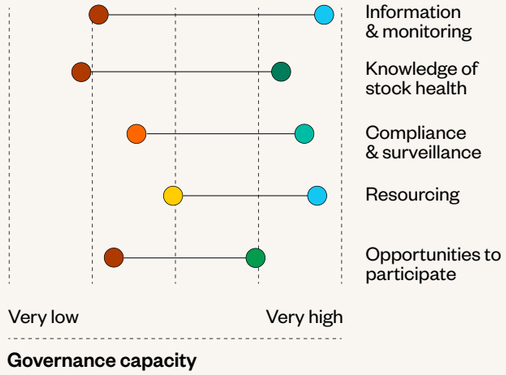


Are there governance mechanisms in place to ensure fishing is sustainable?

Using 72 indicators, we find that, on average, most countries have established the basic elements of fisheries governance. However, major gaps remain – particularly around implementing fisheries policy.

Top 5 governance gaps

When comparing the top and bottom 20 performing countries in governance capacity, we find the greatest gaps relate to:



Of 142 countries, only:

6 have committed to worker rights and safety by signing *ILO Work in Fishing Convention (No. 188)* and the *IMO Cape Town Agreement*

50 have taken action to combat illegal, unreported and unregulated (IUU) fishing, by ratifying the Port State Measures Agreement and adopting a National Plan of Action to combat IUU fishing

71 spend more money on beneficial programs for fisheries management and conservation than on harmful subsidies related to overfishing

89 use participatory management approaches that include local fishing communities in decision-making, such as community-led or customary management

Governance capacity

very low · low · mid · high · very high

Non GFI country

Exclusive Economic Zones

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Phu Yen province, Viet Nam
Photo credit: Khanh Bui via Getty Images

CALL TO ACTION

We call on governments, businesses and local communities to urgently:

1

Set ambitious targets to restore fish stocks and follow through with management action.

Meeting SDG target 14.4 will require countries and businesses to not only commit to improving, but follow through with management action. It will require increased investment in fisheries management, as well as innovation and collaboration across sectors to identify new means of meeting policy commitments. Leaders should start by reviewing the areas where their performance is weakest - using the Index's country-level results to identify critical gaps. Explore what has been successful elsewhere and work to adapt and recreate these interventions to meet local needs.

2

Establish systems to collect and publish fisheries data.

Establish and expand data collection programs and integrate other types of information, including ecological data and local stakeholder knowledge, into decision-making processes. Fisheries information such as catch and effort data, vessel and licence registries and vessel tracking data should be made publicly available to enable independent monitoring and help tackle entrenched issues, such as corruption and illegal behaviour.

3

Embed evidence in fisheries management, using a precautionary approach where uncertainty is high.

Ensure that management strategies and measures are based on scientific evidence, not politics. Train managers on how to best use data to develop policy and how to evaluate and adapt management to ensure success. When data are missing, managers should take a precautionary approach, applying cautious measures to account for uncertainty and reduce potential risks. Considering the vital role fisheries play in livelihoods, food security and nutrition, this process must be applied in *all* fisheries, not just those with high economic value.

RECOMMENDATIONS

Governments

1. Address the worst problems first, including overfished stocks and weak elements of governance.
2. Adopt evidence-based policies that promote sustainable fishing - such as science-based catch and effort limits and harvest control rules.
3. Invest in improving fisheries management – replicate proven successes and trial new approaches to meet global commitments.

Businesses

1. Audit your supply chain and require full disclosure about fishing practices and activities from source companies and vessels.
2. Shift sourcing to reward suppliers that offer sustainable products and those that demonstrate both commitment and progress towards good practices and management.
3. Advocate for, fund and implement policies that will increase the sustainability of fisheries in your supply chain.

Local fishing communities

1. Drive local innovation to develop fit-for-purpose solutions.
2. Advocate for policy change, individually or as part of a fishing association or cooperative.
3. Collaborate with managers, scientists, and other groups to address threats to local fish stocks and ecosystems.

CONTEXT

The fishing and seafood industry is big business – with a staggering 109 million tonnes of fish caught globally in 2018.

Marine fisheries support approximately 260 million jobs,[2] and fish is one of the most-highly-traded food commodities globally – worth over US$160 billion in 2018.[3] Additionally, seafood consumption continues to grow every year, with more than three billion people dependent on seafood for one-fifth of their protein needs.[4]

Without healthy fish stocks and marine ecosystems, the planet and future populations will suffer. Yet, many fisheries resources are being severely misused. This is due to insufficient, inappropriate or absent management, leading to overfishing. The ocean, and the livelihoods of coastal communities that depend on it, are being destroyed by short-term interests, rather than protected by vision of long-term sustainability.

The United Nation's Sustainable Development Goal (SDG) 14 aims to prevent this coming disaster by setting out a framework to conserve and sustainably use the oceans.[5]

Under **SDG target 14.4**, global leaders committed to:

"By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics."

In 2021, this goal is far from being met.

While there have been pockets of success where strong interventions have improved stock health,[6,7] globally, the state of fish stocks is not improving.[8] Fisheries operate across the ocean, with government subsidies inflating fleets far beyond what is economically viable.[9,10,11] Policy makers and businesses focus their resources on big, valuable species, with little regard for smaller, less valuable fisheries. And perhaps most importantly, many fisheries continue to operate with little oversight. As a result, there is a serious lack of knowledge – and data – about fisheries. Without this information, we cannot accurately measure, monitor or manage fisheries for sustainability.

The Global Fishing Index aims to address this problem by providing the largest assessment of the state of fisheries to date and connecting this information with decision-makers to drive global change. The Index assesses the status – whether they are sustainable or overfished – of 1,465 fish stocks across 142 coastal countries. By combining this information with catch data and new information about how fisheries are governed in each country, we report for the first time on the state of fisheries and country-level progress toward SDG target 14.4.

This information is used to identify critical gaps and recommendations for improvement – equipping decision makers with the information they need to end overfishing, restore fish stocks and manage fisheries to ensure long-term sustainability.

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Pa aling divers help to bring a net full of fish to the surface of the ocean. Pa aling is a controversial Filipino fishing technique that involves a team of divers who breathe compressed air pumped down pipes from a boat. On the seabed the divers set up a huge net at one side of a deep sea reef and then swim across the reef in a line from the opposite side in order to corral fish into the net - South China Sea, Philippines. Photo credit: Gulfu Photography via Getty Images

OUR APPROACH

The Global Fishing Index assesses global and country-level progress towards fisheries sustainability: are countries effectively managing fisheries to end overfishing and restore fish stocks to sustainable levels of abundance?

Specifically, we asked three questions:

- What is the state of fish[12] stocks, and how far have countries progressed toward restoring all stocks to sustainable levels?
- What governance mechanisms are in place to ensure fishing is sustainable?
- Based on current progress and governance capacity, what is the outlook for achieving this goal?

Our analysis included 1,465 stocks spanning 142 coastal countries and territories and focused on fisheries within each country's national waters, a band of ocean that extends 200 nautical miles offshore from each country's coastline. Together, these countries accounted for about 92 per cent of total global marine catches in 2018, our baseline year for data.[13] In future editions, we aim to expand coverage to include additional countries and jurisdictions, including the high seas.

Along with stock status, we also highlight the data gap – that is, how much remains unknown about the state of a country's fish stocks. To do this, we divided stocks into those that had been 'assessed' and those that were 'unassessed'. Assessed stocks had official published stock assessment results or sufficient data to estimate current stock abundance, relative to unfished levels. Conversely, unassessed stocks lacked this information and were of unknown abundance.

All data and analyses were subject to strict internal quality control and assurance processes. Additionally, an independent assessment of the Progress score and Governance analyses was undertaken. Based on the activities, it has been determined that the analyses processes align to the agreed technical methods and documentation, and the analyses processes do not alter or manipulate the relevant dataset(s) beyond the stated intent and agreed technical methods.

Importantly, our results are only as good as the underlying information. Increasing global data collection, sharing and transparency in fisheries is key for driving not only future improvements to the Index – but our understanding of the state of fisheries.

••
Commercial fishing vessel for Atlantic bluefin tuna. Tuna are an important species for many countries in terms of catch (tonnage) and value - Mediterranean Sea. Photo credit: Antonio Busiello via Getty Images

What is the state of fish stocks, and how far have countries progressed toward restoring all stocks to sustainable levels?

To understand the global state of fisheries, we used publicly available information and reconstructed catch estimates generated by the Sea Around Us initiative to develop two metrics:

- **Stock sustainability:** the proportion of assessed stocks estimated to be at or above a level of abundance that enables maximum sustainable yield (MSY).
- **Data availability:** the proportion of a country's total reconstructed catch that comes from 'assessed' stocks, where there is sufficient data to determine their relative abundance.

We combined these two metrics into a single Progress score, which captures each country's level of progress towards achieving SDG target 14.4. This score ranges from 0 (no evidence of progress) to 100 (a system in which all catch has been assessed and all stocks are at or above sustainable levels).

In line with SDG target 14.4, the Progress score represents the biological sustainability of fish stocks, rather than ecological sustainability, and does not consider the broader impacts of fishing on marine communities or ecosystems. Despite their importance, with few exceptions, there is an absence of information and methods for assessing these broader aspects of sustainability at a global scale. However, we will explore these alternative ecosystem-based approaches in future iterations of the Index.

Stock sustainability

To calculate stock sustainability, we determined the proportion of assessed fish stocks at the global and country level estimated to be at or above a level of abundance that enables MSY. MSY is the maximum catch that can be continuously removed from a stock, under constant conditions, without affecting long-term productivity. MSY is the most common type of reference point used in fisheries to determine sustainability and is embedded in international policy, such as the United Nation's Convention on the Law of the Sea.

We estimated the current level of abundance, relative to unfished levels (based on biomass – that is, the total mass of the population in tonnes) for as many stocks as possible within each country's waters in 2018. This included fish stocks that occur completely within a country's national waters (national stocks), stocks that are a shared responsibility of neighbouring countries (shared stocks), and stocks that move across multiple exclusive economic zones, are caught by many countries and are managed collaboratively by a regional fisheries body (straddling stocks), that were identified in a country's reconstructed catch data.

Where available, we extracted relative abundance estimates from recent official[14] stock assessments (553 stocks). Where stocks lacked a recent official assessment but had sufficient data publicly available, we used established data limited models – the Bayesian Schaefer Model (BSM) and an updated version of CMSY (known as CMSY++)[15] – to produce novel estimates of relative abundance (912 stocks). To increase confidence in assessment results, we excluded any CMSY++ results that did not have robust estimates of 'end biomass', i.e. published or expert-based biomass estimates since 2014, to inform the model. These models rely on species' productivity and catch time series data to estimate fisheries reference points, such as MSY and biomass, and were developed to help monitor stocks with little data.[16] The addition of these new estimates substantially increased the scope and resolution of fisheries data globally and allowed for comparison across countries.

Next, we used the relative abundance estimates to classify the status of each stock. Stocks whose abundance was estimated to be at or above the level that produces MSY were classified as 'sustainable', while those whose abundance was below this level were classified as 'overfished'. This approach recognises that MSY should be viewed as a lower limit, not a target for stock sustainability. Although the actual level of abundance that produces MSY varies across stocks based on their biological characteristics, we applied a single threshold for all stocks in our dataset. This approach enables direct comparison between countries and removes any incentive for countries to set lower, unsupported levels of MSY.

Specifically, our method assumes that MSY occurs at 50 per cent of unfished levels of stock abundance,[17] with a 10 per cent margin of error, which means that a stock is considered 'overfished' if its current abundance is less than 40 per cent of its unfished abundance. Note, 38 stocks in our dataset were assessed based on spawning stock biomass (SSB) – the total weight of fish in a stock that are old enough to reproduce. In these instances, stocks with an SSB greater than or equal to 20 per cent of the unfished level of SSB were classified as 'sustainable', while those whose abundance was below this level were classified as 'overfished'. These approaches for classifying stocks align with the method used by the Food and Agriculture Organization of the United Nations (FAO).[18]

Finally, global and country-level stock sustainability metrics were calculated as the proportion of assessed stocks classified as 'sustainable' within the global dataset and within each country's national waters, respectively.

We recognise that calculating MSY requires quantitative data and technical expertise, which is not available for all fisheries, and that in the absence of this data, other indicators of stock status can be used. We aim to incorporate other indicators that are used to assess stock status, such as risk-based approaches and indicator species, in future versions of the Index.

Data availability

To fully understand the state of a country's fisheries, it is important to consider not only what is known – that is, the state of assessed stocks – but also what is unknown. Quantifying how much remains truly unknown is a key challenge in fisheries. For example, we do not have a clear understanding of how many stocks exist in a country or region to calculate exactly how many remain 'unassessed'.

In this version of the Global Fishing Index, we use catch as a proxy for understanding this knowledge gap. This is not a perfect proxy, as the ability to assess a large proportion of the catch depends on the size and diversity of fisheries in a country's waters. For example, temperate countries' fisheries are often dominated by a small number of species, while countries in the tropics have highly diverse, multispecies fisheries.

To calculate data availability, we quantified the proportion of the total reconstructed catch within each country's waters from 1990 to 2018 that was represented by the assessed stocks in our dataset. We focused on this historical period to account for stocks that were previously abundant or caught in high amounts but have since been reduced to very low levels of catch.

First, we estimated the total reconstructed catch from within each country's waters for this 29-year period. The Sea Around Us catch reconstruction process combines reported 'official' catch estimates with other information (such as trade records, seafood consumption rates, national employment data and vessel registries) to provide a more comprehensive and accurate estimate of total marine catch within a country's national waters. In the absence of formally defined stock boundaries, species catches were split into stock-level catches using marine ecoregions.[19] Marine ecoregions constitute ecologically distinct areas and were used to represent the geographical ranges of individual stocks within a species.

To estimate what proportion of the total catch has been 'assessed', we divided the combined catch (in tonnes) of the assessed stocks in our dataset by the total reconstructed catch within each country's waters for 1990 to 2018.

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Shoal of bigeye trevallys - Indian Ocean, Maldives
Photo credit: imageBROKER/Norbert Probst via Getty Images

Data on nationally managed catch

We also evaluated the proportion of 'nationally managed catch' that had been assessed for each country. This includes catches from national and shared stocks, but excludes catches from straddling stocks, such as tuna or other highly migratory species, that move across multiple exclusive economic zones, are caught by many countries and are managed collaboratively by a regional fisheries management organisation (RFMO).

To calculate data availability for nationally managed catch, we applied the same approach as that used to calculate the total data available, limiting the analysis to the catch from national or shared stocks only.

Progress score

We multiplied each country's stock sustainability and data availability scores to produce a single Progress score for each country, out of 100. This Progress score represents each country's progress towards SDG target 14.4, in which all fish stocks are restored to sustainable levels of abundance.

We used the data availability for nationally managed catch to ensure a country's Progress score reflects national performance and was not driven by regional management action. We 'capped' the score for any country with less than 10 per cent of their nationally managed catch assessed. The cap was set at the global median (20.4 out of 100). This cap has the effect of keeping these countries within the middle scoring range until the assessment threshold is met. Sixty-eight countries met the cap criteria, but only 26 scored higher than the cap value and had their score adjusted.

What governance mechanisms are in place to ensure fishing is sustainable?

Fisheries governance includes the economic, political and administrative systems that guide the regulation of the fisheries sector.[20] This includes customary social arrangements alongside laws, policies and rules implemented by government, as well as through the private sector, including fisher organisations, seafood buyers and market-related measures.

With many stocks already below sustainable levels, failures in governance threaten fish stocks, the livelihoods of coastal communities and the food security of millions of people. To understand today's situation, and highlight how we can turn it around, the Global Fishing Index assessed a country's capacity to govern their fisheries sustainably.

To assess governance capacity, we followed the process outlined by the Organisation for Economic Co-operation and Development (OECD) for constructing composite indicators.[21] This includes developing a conceptual framework, collecting data, scoring each indicator and weighting and aggregating the indicators, attributes and dimension scores to produce a single governance result for each country.

Fishermen collect their catch from nets central Aceh province, Indonesia on August 31, 2019. Photo credit: wildestanimal via Getty Images

Governance framework

We focused on six areas of fisheries governance, referred to as 'dimensions', which are critical for ensuring sustainable fisheries (Figure 1). These dimensions were further broken down into 18 'attributes', which represented specific, yet interconnected elements of governance and were measured using 72 indicators.

The six dimensions of governance are:

1. **Policy and objectives:** evaluating a country's laws and policies on fisheries, including its environmental, economic and social sustainability goals. This includes the ratification of key international agreements on fisheries management and conservation, as well as worker rights and safety in fisheries. This dimension also assesses harmful subsidies (government funding that enhances fishing capacity and is linked with overfishing).
2. **Management capacity:** assessing the resources, expertise and tools available to manage fisheries, including financial, technical and professional capacity. This dimension also assesses various management measures, particularly science-based measures, such as harvest control rules.
3. **Information availability and monitoring:** measuring the range, quality and resolution of information available in each country to inform fisheries management and decision-making. This includes information about catch and fishing effort, the state of fish stocks and the size and structure of the fishing fleets operating inside a country's national waters.
4. **Level and control of access to fisheries resources:** assessing the extent to which fishing fleets (domestic and foreign) have access to a country's fisheries. This dimension also assesses the diversity of tools used to regulate and monitor access, including fishing licence requirements and spatial zoning (e.g. marine protection or exclusion areas).
5. **Compliance management system:** evaluating the strength of a country's fisheries compliance and enforcement program, including monitoring and surveillance to detect illegal fishing and the use of sanctions to penalise infractions. This dimension also examines the perceived integrity of the fisheries authority and judicial system and the level of high-risk fishing activities, including flags of convenience vessels registered to foreign countries to evade regulation or tax.
6. **Stakeholder engagement and participation:** assessing the capacity of stakeholders (including fishers, seafood processers, governmental and non-governmental organisations, research institutions and local communities) to meaningfully participate in fisheries governance and management processes, including whether the managing authority enables these interactions and whether the stakeholders have the capacity to engage, for example through fisher organisations.

Figure 1: *Six dimensions of governance assessed in each country. These dimensions comprise 18 attributes, which are measured using 72 indicators.*

Data collection and analysis

We collected governance data for each country using publicly available information including published datasets, reports and peer-reviewed journal papers. These data were supplemented with an online questionnaire and interviews with local fisheries experts, including government officials, scientists and academics, fishing industry representatives and non-government organisation (NGO) staff. We collected 274 completed questionnaires across 116 countries and conducted 216 interviews across 76 of the assessed countries. Data were collected between August 2019 and May 2020.

We used this data to score each of the 72 indicators (out of 100). Indicator scores were then averaged to produce attribute and dimension-level scores. We surveyed 43 experts (including government officials, NGO staff, academics and industry members) to understand the relative importance of each of the six dimensions for ensuring sustainable fisheries and calculating dimension-level weights. We then combined the six dimension-level scores to produce an overall weighted average assessment score (out of 100) for each country.

We used multiple decision criteria to convert the assessment scores to a Governance capacity level, ranging from very low (no evidence of a system for governing fisheries) to very high (representing a well-developed system with very high capacity to secure sustainable fisheries). This approach considers the strength of the governance system, based on the overall assessment score, as well as the level of balance across the dimensions, based on dimension-level scores (Table 1). This approach recognises that each of the six dimensions are crucial for ensuring a well-functioning governance system and that a high score in one dimension cannot fully compensate for a low score in another.

Where a country does not meet all required criteria, it was capped at the highest Governance capacity level in the lower balance criteria.

We understand there is no single 'best' system for governing fisheries to achieve sustainable fishing. We also acknowledge that our assessments are biased towards a conventional, 'top-down' governance approach. Additionally, there will be cases where a country may score poorly for a specific attribute or dimension due to the indicators used, despite having an alternative system in place that may achieve the same outcome. We are working to improve our ability to recognise and measure alternative systems and approaches in future versions of the Index.

Table 1: *Rubric used to determine a country's Governance capacity to ensure sustainable fishing in national waters, between zero ('Very low') and 12 ('Very high'), based on overall assessment score and balance across dimensions. A country must meet the assessment score and balance criteria to advance to the next capacity level.*

Assessment score	< 40	40-44.9`	45-49.9`	50-54.9`	55-59.9`	60-64.9`	65-69.9`	70-74.9`	75-79.9`	80-84.9`	85-89.9`	90-94.9`	95-100
Balance criteria	None				Minimum of 30 across all dimensions					Minimum of 60 across all dimensions			
Governance capacity	Very Low	Very low	Low	Low	Low	Med	Med	Med	High	High	High	Very high	Very high
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

Our framework does not consider fishing activities conducted by a country's fleet outside their national waters. As a result, fishing by 'distant water fleets' is assessed against the country in which the fishing occurs. We recognise that many countries do not have the capacity to monitor or enforce foreign fishing activities within their waters, and that governance of these fleets is also the responsibility of the vessel's flag state – the country where the vessel is registered and whose flag it is authorised to fly. We will be addressing 'flag state' responsibilities and behaviour in future reports.

The governance results do not necessarily reflect the effectiveness of the elements in place. Achieving sustainable fisheries will depend on a country's ability to implement and enforce policies, plans and management activities that are committed to 'on paper'. Countries must first make these commitments and build the systems capable of effective governance. Then they must work to implement them fully and effectively.

Based on current Progress and Governance capacity, how are countries performing against SDG target 14.4?

We awarded each country a single overall grade, based on current performance and the outlook for restoring fish stocks and ensuring sustainable fisheries. The highest possible grade is A, followed by B, C, D, E and F.

Grades were determined based on a country's Progress score and Governance capacity. First, the Progress score was used to identify the grading band. Progress scores between 0-10 represent 'negligible progress', Progress scores between 10-40 represent 'limited progress', Progress score between 40-70 represent 'some progress', Progress score between 70-90 represent 'significant progress' and Progress score between 90-100 represent achieving SDG target 14.4 and flourishing, sustainable fisheries. We then used the Governance capacity level to determine the final overall grade. Where a country had limited Governance capacity (i.e. level 5 or lower), it was downgraded, representing an increased risk of the over exploitation of fish stocks in the future and/or limited prospect of improvement from current levels of progress towards SDG target 14.4 (Table 2).

Countries fall into a grading band for different reasons, and it is important to review country-specific results and recommendations on our website.

Table 2: *Rubric used to determine a country's overall grade, based on its Progress score and Governance capacity*

	Governance capacity	
Progress score	Medium or above (level 6 – 12)	Very low to low (level 0 – 5)
90 – 100 (Flourishing)	A	B
70 – 90 (Significant progress)	B	C
40 – 70 (Some progress)	C	D
10 – 40 (Limited progress)	D	E
0 – 10 (Negligible progress)	E	F

••

Fish market - Hue city, Viet Nam.
Photo credit: HNH Images via Getty Images

KEY FINDINGS

Fisher women dry fish (Bombay duck) on bamboo poles – Mumbai, India Photo credit: Photo by Ashish Vaishnav/SOPA Images/LightRocket via Getty Images

1

Half of assessed fish stocks are overfished – and nearly 1 in 10 have been driven to the point of collapse.

Of the 1,465 stocks we assessed, 49 per cent are overfished – meaning they have been depleted below 40 per cent of unfished populations (the level that can produce MSY). This is considerably higher than a previous estimate of 34 per cent, based on a smaller sample of stocks.[22] Additionally, if we were to apply a hard limit for MSY at 50 per cent (with no margin of error), the proportion of overfished stocks would rise to 62 per cent.

Alarmingly, one in five stocks within our data is estimated to be below 20 per cent of unfished levels of abundance, far below what is considered sustainable. Additionally, eight per cent of stocks have been reduced to less than 10 per cent of unfished populations (Figure 2) – the point of collapse.

Overfished stocks require between three and 30 years to recover to sustainable levels of abundance – depending on the extent to which they have been depleted, their exploitation history, how fast they grow and reproduce, and fishing pressure during the recovery period.[23,24,25,26] The fate of these fish stocks, and associated marine ecosystems and fishing communities, depends on authorities taking swift and decisive action to rebuild them to sustainable levels.

Interestingly, most countries (74 per cent) in our dataset have a stock sustainability score above 50 per cent – meaning that over half of the assessed stocks in their national waters are sustainable. This figure on its own, however, is misleading – as many countries have assessed few stocks or the assessed stocks comprise only a small portion of their total catch. For example, an estimated 91 per cent of the assessed stocks in Eritrean waters are sustainable. But these assessed stocks account for only *one per cent* of its total catch and the state of almost all its fish stocks is unknown. This calls to attention the importance of considering not only what is assessed, but also how much remains unknown about a country's fish stocks when evaluating sustainability.

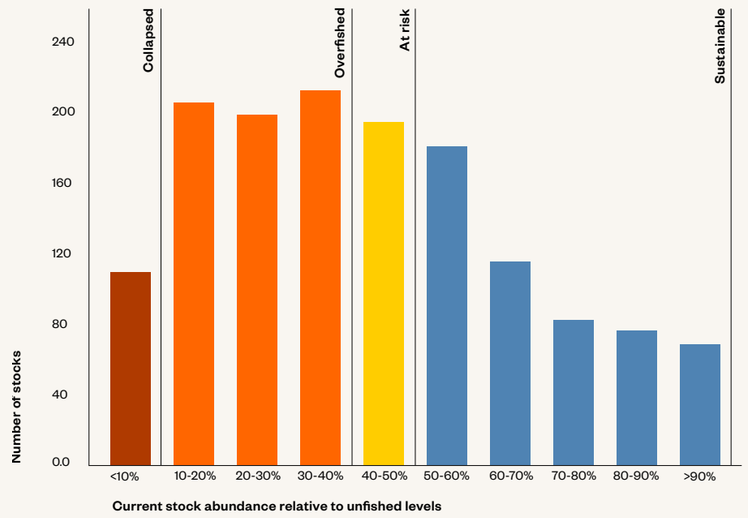
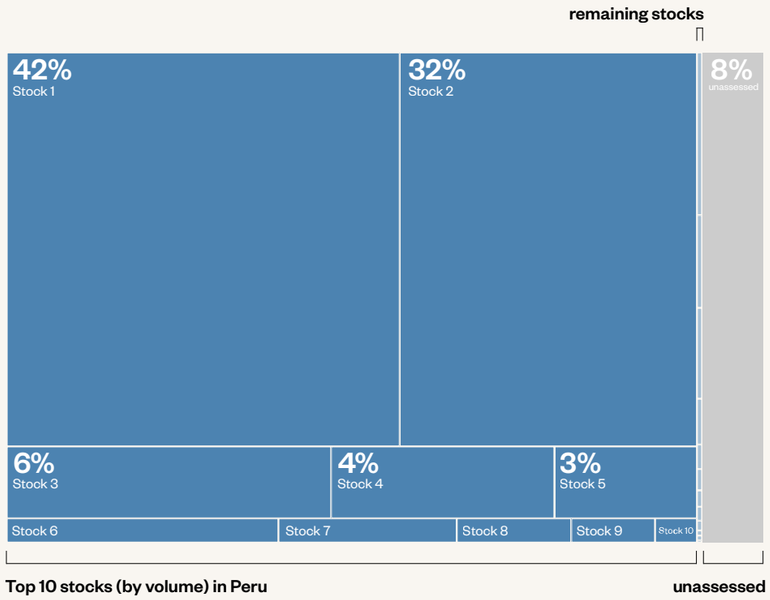
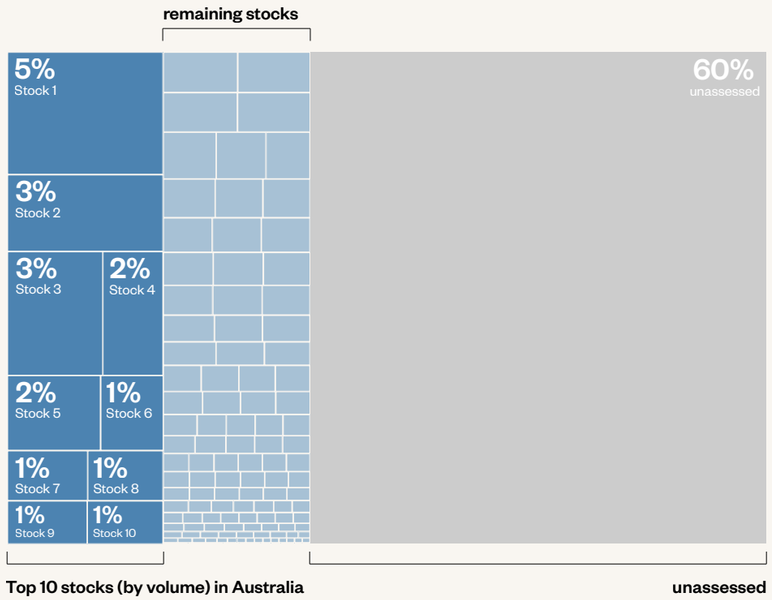


Figure 2: *Number of fish stocks, by relative abundance. Relative abundance is defined as a stock's current abundance (biomass) relative to historic, unfished levels. Half of assessed stocks are currently less than 40 per cent of unfished levels of abundance, one quarter sit at 40–60 per cent, and one quarter are above 60 per cent.*

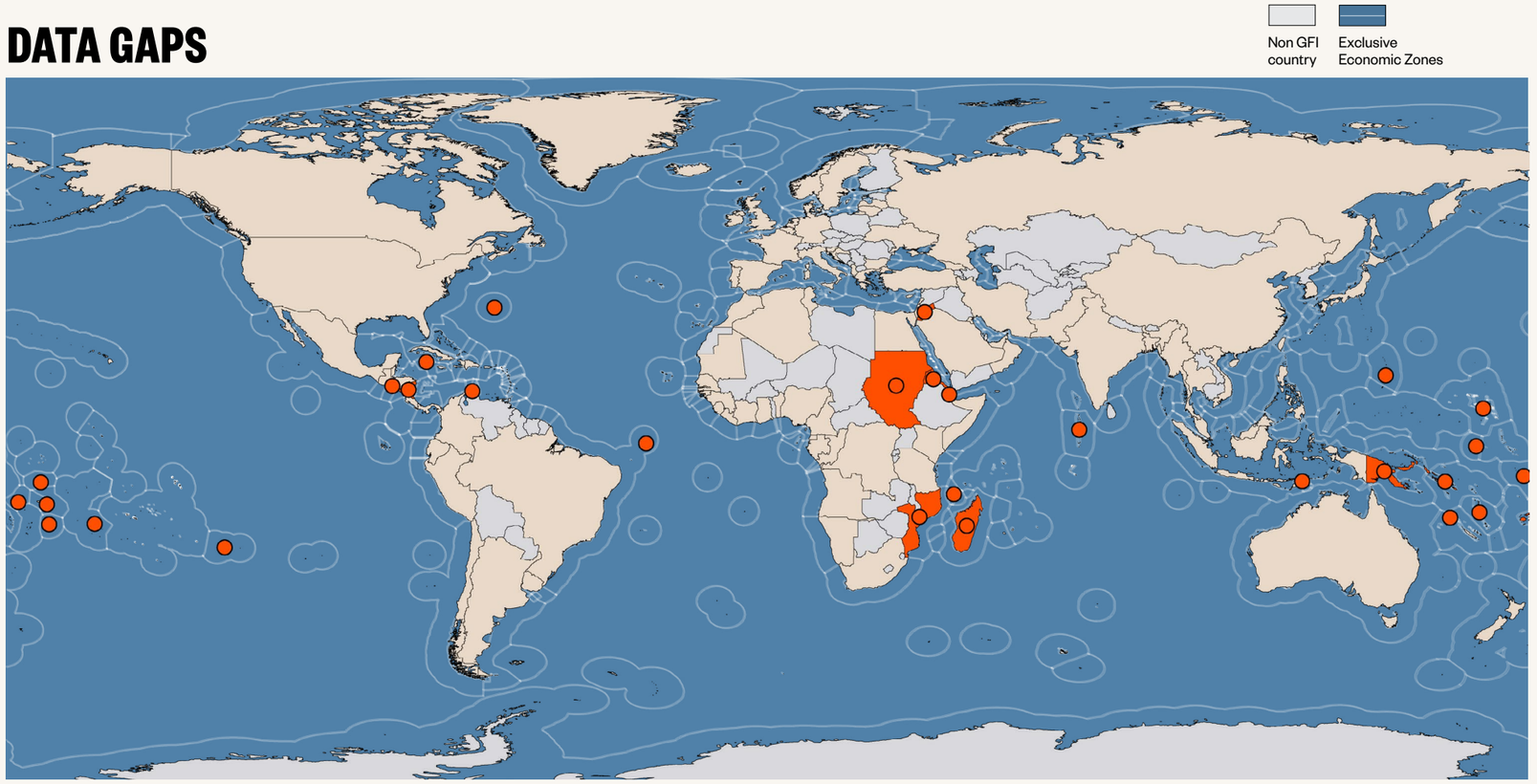




Peru & Australia Comparison

Countries differ in the size of fish stocks assessed, based on total catch. For example, the top 10 stocks by catch (in tonnes) in Peru account for 91 per cent of total catch. In comparison, the top 10 stocks by catch (in tonnes) in Australia account for only 21 per cent of total catch.

DATA GAPS



2

Half of the global catch is from unassessed stocks, which lack the data to say if they are sustainable or not.

Fifty-two per cent of the global catch since 1990 has come from stocks that lack sufficient data to estimate stock abundance. As a result, we do not know if this catch is sustainable. Without this information, decision-makers are operating 'in the dark', unable to effectively manage fisheries.

Globally, far too few fish stocks have been assessed: one-third of countries in our dataset have assessed less than a quarter of what is caught in their waters. Additionally, we find that 68 countries have assessed less than 10 per cent of their 'nationally managed' catch, which comes from fish stocks that occur completely within a country's jurisdiction (national stocks) or are a shared responsibility of neighbouring countries (shared stocks).

Twenty-nine of these countries do not have a single national or shared stock assessed (Figure 4) – with their data availability limited to RFMO-managed stocks. More than half of these are small island developing states that rely on coastal stocks as a critical source of jobs, food, and nutrition for local communities.[27,28] This result reveals a surprising contrast for many countries whose economies depend on highly migratory species, like tuna. Many of these countries, particularly in the Pacific, have made substantial progress to develop strong regional management of these straddling stocks[29,30] – yet there is little information about the state of critical inshore fish stocks.[31,32] For example, 82 per cent of Kiribati's *total* catch is sustainable due to the dominance of tuna, but Kiribati is yet to assess a single national stock. Building capacity to monitor and manage coastal stocks will be crucial for ensuring sustainable use of these locally valuable resources.

We note that some countries have an advantage in terms of data coverage, with most of their catch coming from a handful of large stocks. This advantage depends on the level of marine biodiversity within a country's waters and a country's fisheries. Peru, for example, scores well because its fisheries are dominated by two large anchoveta stocks that together account for over 70 per cent of the total catch (Figure 3).[33] In comparison, other countries catch dozens of species in smaller amounts, making it harder to achieve good data coverage. Australia, for example, has 133 assessed stocks in our dataset, yet 60 per cent of its catch remains unassessed (Figure 3).

Figure 3 (top): *Comparison of stock size as a proportion of total marine catch in Australia and Peru's national waters (1990-2018).*

Figure 4 (bottom): *Twenty-nine countries in our dataset have not assessed a single national stock, demonstrating the lack of data availability within coastal fisheries. Most of these countries occur in tropical areas and many (62 per cent) are Small Island Developing States.[34]*

Figure 5: *Country-level performance based on progress towards restoring fish stocks and governance capacity to ensure sustainable fishing. Colours indicate overall grade received.*

3

With few exceptions, countries are failing to deliver on global commitments.

We find that globally, there is a clear gap between management commitments and the actions required to achieve on-the-water change. Over half (56 per cent) of the countries in our dataset have developed basic governance and management frameworks to prevent overfishing and restore fish stocks. However, on average countries score only 19 out of 100 for progress; this means that they are only one-fifth of the way towards achieving SDG target 14.4.

Based on current progress and governance capacity to improve fish stock health, no country achieved an 'A' or 'B' grade – in which most fish stocks are assessed and known to be sustainable. Just six countries – Chile, Iceland, Ireland, Latvia, Norway and the United States of America – received a 'C', the highest grade achieved. These countries achieve a Progress score of at least 40 out of 100 and have well-developed governance systems.

However, while progress has been made in some fisheries, additional work is needed to expand management across additional stocks to reach global sustainability goals.

Eighty-two per cent of countries received a 'D' or 'E' grade – including five of the top ten countries with the highest marine catch in their waters: China, Indonesia, Japan, Peru and the Russian Federation. These countries have made limited progress toward SDG target 14.4, a substantial portion of their stocks are overfished or unassessed and/or their fisheries governance system is lacking the basic elements needed to effectively manage fisheries.

Twenty countries get an 'F' grade – including Viet Nam and Malaysia, which are among the top ten countries with the highest marine catch in their waters. In these countries, nearly all stocks are unassessed or overfished, and there is little prospect of advancing without major improvements in management.

Fishing net full of large fresh fish - South Australia, Australia
Photo credit: Tim phillips photos via Getty Images

4

Most fisheries lack science-based management.

Science-based fisheries management, in which policy and management actions are based on fisheries data, is essential for preventing overfishing and securing sustainable fisheries.[35,36,37]

We find that most countries do not, and are currently unable to, effectively apply science-based management in all fisheries. This is because they do not collect or analyse basic fisheries data, do not base management on scientific evidence and/or do not monitor or enforce regulations to ensure fishers comply with the rules. Even the highest performing countries are failing to apply science-based management in all fisheries. Nonetheless, most countries (85 per cent) have set clear environmental sustainability goals to guide decision-making – the first step of science-based management.

There are three key issues:

- **Most countries do not consistently collect or analyse fisheries data.** Although 81 per cent of the countries assessed require fishers to collect catch or effort data in their most valuable fishery,[38] nearly half do not independently verify the reported information or routinely enforce reporting requirements.[39] Additionally, almost 40 per cent of countries do not use fisheries data to assess changes in abundance for most of their stocks.[40]
- **Where data is available, it is not being used for management.** Only 46 per cent of countries assessed apply science-based catch or effort limits in more than a few fisheries.[41] Further, only 41 per cent of countries use harvest control rules, pre-agreed rules that guide management action based on stock health, in their most valuable fishery.
- **Compliance with regulations is not being monitored or enforced.** While 87 per cent of countries assessed require both in-port and on-water inspections,[42] 27 per cent of these do not consistently conduct these checks.[43] Additionally, only one-third of countries have made strong commitments to combat illegal, unreported and unregulated (IUU) fishing by adopting a National Plan of Action to prevent IUU fishing and ratifying the FAO's 2009 Port State Measures Agreement. While nearly all countries have strong penalties for rule breakers, bribery and corruption are considered a common occurrence in a quarter of the countries assessed, jeopardising compliance systems.[44]

5

Key stakeholders, including local fishing communities, are unable to effectively participate in management.

Despite their importance in enabling effective management, few countries empower stakeholders, including local fishing communities, to meaningfully participate in management processes. Stakeholders act as a source of information on fishing activities, threats and stock and ecosystem health and help hold decision-makers to account.[45,46,47] Stakeholder participation in decision-making, especially fishers, can also increase compliance with the rules, reducing enforcement costs.[48,49]

Yet one-quarter of countries assessed do not legally require authorities to include fishers in decision-making. Additionally, nearly 40 per cent of countries lack 'bottom up' forms of governance, such as community-based or customary management, where stakeholders are active participants in management processes.

In many countries, stakeholders lack the capacity to effectively engage in management due to a lack of organisation and representation, such as through fisher working groups or cooperatives, or transparency in decision making. For example, only 23 per cent of countries publish minutes from management meetings, making it difficult for people to respond or track how decisions are made. Transparency in decision-making is critical for improving information sharing, as well as holding decision-makers to account and tackling fisheries corruption.

A woman dries anchovies along Lhokseudu beach in Aceh province, Indonesia –January 26, 2021. Photo credit: haideer mahyuddin/afp via Getty Images

BRIGHT SPOTS

LESSONS IN FISHERIES SUCCESS

Despite the lack of progress towards fisheries sustainability globally, there have been pockets of success where interventions have improved fisheries outcomes. Important lessons can be learned from these 'bright spots' – instances where strong action and innovative solutions are improving fisheries outcomes.

A global study of fisheries management looking at stocks over time shows that, on average, stocks with highly reliable data and robust scientific assessments of status are healthy or improving.[50] The specific tools leading to the best outcomes include adopting clear rebuilding plans, strong national policy commitments and harvest control rules.[51]

Likewise, new technologies are emerging that are changing the way fisheries information is collected and used – empowering communities and policy makers to make evidence-based decisions. Combining community training with beachside data collection, smartphones and solar-powered tracking devices, **small-scale fisheries are being transformed** in Timor-Leste[52] – bringing new insights into fishing patterns and providing accurate estimates of national catches for the first time in two decades.

At the other end of the scale, industrial fishing vessels that operate without broadcasting their positions are now being 'seen' using a suite of cutting-edge technology. The combination of vessel tracking technology and satellite images reveal the extent of fishing activities by these '**dark fleets**'.[53]

By monitoring where these vessels are and what they are likely to be fishing, we can now uncover illegal fishing activities and hold perpetrators to account.

When there are few alternatives for food and employment, overfishing can trap fishers in a vicious cycle – chasing fewer and fewer fish to meet livelihood needs. Some fishers have been able to break out of this trap by acting holistically and combining improvements in environmental sustainability with increased profits through a co-management approach.[54] In Mexico, a **unique 'triple impact' approach combining people, planet and profits** is incentivising sustainable fishing, leading to increased income alongside less overfishing, investments in no-take reserves and reduced bycatch.

These case studies – and other examples from around the world – demonstrate that we can transform the current state of fisheries. We have included these examples to help share successful approaches, so they can be replicated and adapted elsewhere and to inspire new solutions to address fisheries challenges.

••

Porfirio Z. Zuñiga (above) and other partners of his co-op at Punta Abreojos, BCS Mexico dramatically improved the quality and price of their sandbass by improving their catching, handling, processing, packing, and transport techniques. Photo credit: © Carlos Aguilar, SmartFish

••

A security ship crew of Ministry of Maritime Affairs and Fisheries, monitor radar during a patrol in the South China Sea on August 17, 2016 in Natuna, Ranai, Indonesia. Photo credit: SONNY TUMBELAKA/AFP via GettyImages

THE SOLUTIONS

The goal of this first Global Fishing Index is to help governments, businesses and local communities understand the state of fisheries in national waters and to shine a light on the extent of the global fisheries crisis, and identify solutions that will drive improvements in fisheries sustainability.

It is clear from our results that the current approach for managing and rebuilding fish stocks is not working. With few exceptions, most countries have been unable to deliver against global commitments, resulting in meagre progress towards SDG target 14.4.

Some of the solutions already exist. However, we also need to develop and share new, accessible means of managing fisheries that can be adapted and replicated to scale-up progress around the world.

Restoring fish stocks to sustainable levels will require action by *all* stakeholders including governments, the fishing industry, seafood businesses, civil society organisations and local communities. This will require that we commit to, and invest in, making this change.

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Fishermen throw fishing net on boats to catch fish in Hue, Viet Nam. Photo credit: Tran Tuan Viet via Getty Images

CALL TO ACTION

We call on governments, businesses and local communities to:

1

Set ambitious targets to restore fish stocks and follow through with management action.

Meeting SDG target 14.4 will require countries and businesses to require countries and businesses to not only commit to improving, but follow through with management action. It will require increased investment in fisheries management, as well as innovation and collaboration across sectors to identify new means of meeting policy commitments. Leaders should start by reviewing the areas where their performance is weakest - using the Index's country-level results to identify critical gaps. Explore what has been successful elsewhere and work to adapt and recreate these interventions to meet local needs.

2

Establish systems to collect and publish fisheries data.

Establish and expand data collection programs and integrate other types of information, including ecological data and local stakeholder knowledge, into decision-making processes. Fisheries information such as catch and effort data, vessel and licence registries and vessel tracking data should be made publicly available to enable independent monitoring and help tackle entrenched issues, such as corruption and illegal behaviour.

3

Embed evidence in fisheries management, using a precautionary approach where uncertainty is high.

Ensure that management strategies and measures are based on scientific evidence, not politics. Train managers on how to best use data to develop policy and how to evaluate and adapt management to ensure success. When data are missing, managers should take a precautionary approach, applying cautious measures to account for uncertainty and reduce potential risks. Considering the vital role fisheries play in livelihoods, food security and nutrition, this process must be applied in *all* fisheries, not just those with high economic value.

RECOMMENDATIONS

GOVERNMENTS

Governments have the primary responsibility for governing fisheries. They have a responsibility to their citizens to prevent overfishing and ensure the sustainable use of marine resources.

1

Eliminate the worst drivers of overfishing first.

Reconsider the management measures in place for overfished stocks and take corrective action where needed. Work to improve governance, focusing on the gaps identified in your assessment results. Combat IUU fishing by adopting a National Plan of Action and ratifying the FAO 2009 Port State Measures Agreement. Commit to protecting worker rights and safety by signing the *2007 ILO Work in Fishing Convention (No. 188)* and the *2012 IMO Cape Town Agreement*. Eliminate perverse incentives that drive overfishing, such as harmful subsidies.

2

Implement strategies to achieve sustainability goals.

Set public, time-bound and measurable targets to improve the state of fisheries, such as rebuilding plans for overfished stocks, track your performance and publish fisheries data to increase accountability.

Adopt evidence-based policies that promote sustainable fishing - such as science-based catch and effort limits and harvest control rules.

3

Invest in fisheries management programs.

Including the personnel, infrastructure and equipment needed to apply science-based management. Develop and trial innovative approaches to achieve these goals (available at www.globalfishingindex.org).

Country-specific results and recommendations are also provided at www.globalfishingindex.org

RECOMMENDATIONS

FISHING AND SEAFOOD BUSINESSES

Businesses represent a powerful force that can dramatically and rapidly improve seafood supply chains through corporate policies and market incentives.[55] Businesses have a responsibility to ensure they contribute to fisheries improvements and don't profit from overfishing.

1

Audit your supply chain.

Require full disclosure from companies in your supply chain about where they are fishing, what they are catching and how it is being caught or produced, including labour practices. Insist on who, what, where and how as mandatory reported metrics.

2

Change sourcing habits.

Adopt real, quantifiable and time-bound commitments to avoid companies or fishing regions that are not sustainable, and shift to suppliers that demonstrate good sustainability practices and management.

3

Support improvements.

Take an active role in advocating, funding and implementing policy and management reform that will increase the sustainability of fisheries in your supply chain. This includes collaborating with like-minded stakeholders in your supply chain to effect change, for example via pre-competitive action or credible fishery improvement projects.

RECOMMENDATIONS

LOCAL FISHING COMMUNITIES

Small-scale, artisanal and subsistence fishing plays an integral role in global fisheries – representing a range of diverse fishing activities from beach collecting to coastal fishing using small vessels. These communities stand to lose the most if fisheries and ecosystems collapse, and they play an important role in achieving a productive, equitable and sustainable future for fisheries.

1

Trial local solutions.

We recognise that each fishery is different, and solutions to overfishing in the small-scale sector *must* be locally driven and fit-for-purpose. Improvements will require the use of new and existing management tools that are simple, affordable and scalable across these systems. Where available, collaborate with government agencies, scientists, other fisher groups, civil society organisations and local communities to address sustainability concerns and threats to local fish stocks and ecosystems.

2

Advocate for change.

All individuals and small operators – from harvesters to sellers – can advocate for change and contribute to a better approach to fisheries. To help accelerate management improvements, consider joining with others (in an association or cooperative) to coordinate and negotiate with regulators, and the companies who buy, process and market your fish.

COUNTRY LEVEL RESULTS

Results and supporting data for 142 countries assessed in the 2021 Global Fishing Index.

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Man hauling fishing boat into the ocean, Accra ,Ghana. Photo credit: Junior Asiama / 500px via Getty Images

** denotes countries that have assessed less than 10% of the catch from nationally managed stocks and whose Progress score has therefore been capped.*

*Note, 26 countries had their scores adjusted due to the cap (denoted by *†)*

			Overall results			Progress results and supporting data					Governance results						
Country name	ISO Code	Region	Grade (A to F)	Progress score (out of 100)	Governance level (0-12)	Data availability	Stock sustainability	Number of stocks assessed	Number of official assessments	Number of novel estimates	Assessment score (out of 100)	Policy and objectives	Management capacity	Information availability	Level and control of access	Compliance management system	Stakeholder engagement
Albania	ALB	Europe and North America	E	16.2	4	29.7%	54.5%	11	1	10	55	59	55	61	43	73	43
Algeria	DZA	Northern Africa and Western Asia	E	28.4	5	57.7%	49.2%	59	3	56	64	57	83	67	81	68	43
American Samoa	ASM	Oceania	D	20.4*†	7	58.7%	54.5%	11	9	2	73	47	90	91	57	94	92
Angola	AGO	Sub-Saharan Africa	E	11.6	4	17.4%	66.7%	18	8	10	58	53	70	51	61	74	43
Anguilla	AIA	Latin America and the Caribbean	E	18.8	3	28.3%	66.7%	12	8	4	52	59	43	46	56	82	33
Antigua and Barbuda	ATG	Latin America and the Caribbean	D	29.6	7	39.5%	75.0%	8	6	2	71	59	90	57	72	87	71
Argentina	ARG	Latin America and the Caribbean	D	31.3	6	60.7%	51.5%	33	13	20	70	64	70	82	83	76	51
Aruba	ABW	Latin America and the Caribbean	E	20.4*†	0	45.5%	69.2%	13	8	5	35	50	20	21	52	57	26
Australia	AUS	Oceania	D	24.9	10	39.9%	62.4%	133	92	41	88	78	93	96	83	97	88
Bahamas	BHS	Latin America and the Caribbean	E	33.7	5	87.1%	38.7%	31	7	24	62	76	68	51	47	78	56
Bangladesh	BGD	Central, Southern, Eastern and Southeast Asia	E	35.7	5	38.0%	93.8%	16	6	10	64	69	58	59	81	74	47
Barbados	BRB	Latin America and the Caribbean	F	5.3*	1	7.9%	66.7%	12	8	4	40	51	30	49	22	49	46
Belgium	BEL	Europe and North America	D	14.9	8	29.7%	50.0%	16	11	5	78	73	85	86	76	81	71
Belize	BLZ	Latin America and the Caribbean	E	19.8	4	33.9%	58.3%	12	5	7	59	48	75	48	67	86	46
Benin	BEN	Sub-Saharan Africa	F	3.4*	4	4.6%	73.3%	15	8	7	59	71	58	40	69	59	56
Bermuda	BMU	Europe and North America	E	20.4*†	4	51.8%	70.0%	10	7	3	56	47	55	61	65	82	38
Bonaire, Sint Eustatius and Saba	BES	Latin America and the Caribbean	D	50.5	3	67.3%	75.0%	16	8	8	51	45	53	43	50	61	60
Brazil	BRA	Latin America and the Caribbean	D	17.4	6	28.0%	62.2%	37	10	27	69	58	65	65	68	81	85
Bulgaria	BGR	Europe and North America	E	9.5	8	28.5%	33.3%	6	1	5	75	76	85	96	44	79	82
Cabo Verde	CPV	Sub-Saharan Africa	D	20.4*†	6	51.6%	60.0%	15	8	7	67	64	68	72	62	86	53
Cameroon	CMR	Sub-Saharan Africa	F	2.6*	0	3.4%	75.0%	16	7	9	29	56	38	4	22	63	35
Canada	CAN	Europe and North America	D	35.7	8	77.5%	46.1%	193	142	51	76	71	90	91	54	97	63
Cayman Islands	CYM	Latin America and the Caribbean	F	3.7*	3	11.1%	33.3%	3	3	0	50	51	30	41	67	71	50
Chile	CHL	Latin America and the Caribbean	C	47.7	9	77.6%	61.5%	26	10	16	84	75	90	89	76	91	89
China	CHN	Central, Southern, Eastern and Southeast Asia	D	11.4	6	31.5%	36.2%	58	17	41	67	45	75	78	67	82	71
Colombia	COL	Latin America and the Caribbean	E	28.4	3	45.2%	63.0%	27	14	13	56	52	88	74	67	60	24
Comoros	COM	Sub-Saharan Africa	E	20.4*†	4	63.5%	70.6%	17	14	3	56	35	73	64	58	63	64
Congo	COG	Sub-Saharan Africa	E	13.7	5	18.3%	75.0%	16	8	8	62	57	65	47	75	73	64
Cook Islands	COK	Oceania	D	20.4*†	7	49.6%	61.5%	13	9	4	72	76	85	79	61	85	51

Country name	ISO Code	Region	Overall results			Progress results and supporting data					Governance results						
			Grade (A to F)	Progress score (out of 100)	Governance level (0-12)	Data availability	Stock sustainability	Number of stocks assessed	Number of official assessments	Number of novel estimates	Assessment score (out of 100)	Policy and objectives	Management capacity	Information availability	Level and control of access	Compliance management system	Stakeholder engagement
Costa Rica	CRI	Latin America and the Caribbean	E	20.4*†	3	41.6%	71.4%	21	17	4	54	56	65	33	64	70	47
Côte d'Ivoire	CIV	Sub-Saharan Africa	E	16.7	4	24.4%	68.4%	19	8	11	59	63	63	82	42	66	44
Croatia	HRV	Europe and North America	D	37.8	7	66.1%	57.1%	14	1	13	73	85	75	85	75	86	40
Cuba	CUB	Latin America and the Caribbean	E	12.6	3	23.0%	54.5%	11	8	3	58	74	58	91	89	67	15
Cyprus	CYP	Europe and North America	E	18.6	1	55.9%	33.3%	12	0	12	40	77	68	70	42	78	3
Democratic Republic of the Congo	COD	Sub-Saharan Africa	E	11.6*	3	18.9%	61.5%	13	8	5	53	58	50	36	56	51	75
Denmark	DNK	Europe and North America	D	36.8	8	71.8%	51.3%	39	27	12	78	83	85	96	74	77	60
Djibouti	DJI	Sub-Saharan Africa	F	0.1*	2	0.1%	76.9%	13	13	0	49	71	70	32	81	63	15
Dominican Republic	DOM	Latin America and the Caribbean	F	1.5*	4	2.6%	60.0%	15	5	10	59	62	78	58	67	66	36
Ecuador	ECU	Latin America and the Caribbean	D	32.7	6	60.8%	53.8%	26	11	15	68	64	78	78	83	65	49
Egypt	EGY	Northern Africa and Western Asia	E	3.5*	6	6.8%	51.9%	27	11	16	66	56	73	80	87	58	57
El Salvador	SLV	Latin America and the Caribbean	E	3.9*	6	5.4%	72.7%	11	9	2	65	62	65	65	68	70	64
Equatorial Guinea	GNQ	Sub-Saharan Africa	E	5.4*	6	8.1%	66.7%	15	8	7	65	55	88	80	67	52	64
Eritrea	ERI	Sub-Saharan Africa	F	1.0*	4	1.1%	90.9%	11	11	0	58	63	85	40	48	69	51
Falkland Islands (Malvinas)	FLK	Latin America and the Caribbean	D	16.6	7	27.0%	61.5%	13	4	9	71	59	95	92	60	85	53
Federated States of Micronesia	FSM	Oceania	E	20.4*†	5	87.6%	77.8%	9	7	2	63	42	83	77	52	74	71
Fiji	FJI	Oceania	D	20.4*	7	28.1%	73.3%	15	11	4	73	69	88	80	68	88	54
France	FRA	Europe and North America	D	21.5	9	46.9%	45.8%	107	46	61	80	80	83	91	67	97	68
French Polynesia	PYF	Oceania	D	20.4*†	7	57.4%	70.6%	17	11	6	72	61	75	85	56	89	79
Gabon	GAB	Sub-Saharan Africa	E	11.8*	5	17.2%	68.8%	16	8	8	62	67	78	43	52	74	63
Gambia	GMB	Sub-Saharan Africa	E	13.0	5	26.9%	48.1%	27	8	19	61	66	55	49	49	89	65
Georgia	GEO	Northern Africa and Western Asia	E	36.9	2	92.2%	40.0%	5	1	4	49	47	53	54	42	74	32
Germany	DEU	Europe and North America	D	18.9	8	47.3%	40.0%	30	26	4	76	78	95	84	72	90	49
Ghana	GHA	Sub-Saharan Africa	D	40.0	6	55.2%	72.4%	29	8	21	65	63	78	86	58	70	46
Greece	GRC	Europe and North America	E	12.0	3	21.4%	56.3%	16	3	13	62	68	65	68	72	89	29
Greenland	GRL	Europe and North America	D	21.0	7	42.1%	50.0%	18	13	5	72	54	90	86	71	87	63
Grenada	GRD	Latin America and the Caribbean	E	20.4*†	4	46.5%	69.2%	13	7	6	57	46	65	65	42	65	68
Guatemala	GTM	Latin America and the Caribbean	F	3.0*	5	4.3%	70.0%	20	16	4	62	48	75	70	68	54	68
Guinea	GIN	Sub-Saharan Africa	F	5.8*	4	10.1%	57.1%	21	8	13	58	57	90	44	57	69	47
Guinea-Bissau	GNB	Sub-Saharan Africa	E	5.5*	6	9.9%	55.2%	29	8	21	65	76	68	56	53	76	63

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Haiti	HTI	Latin America and the Caribbean	F	4.2*	0	7.3%	58.3%	12	8	4	38	43	38	14	49	56	46
Honduras	HND	Latin America and the Caribbean	F	6.0*	3	9.3%	64.7%	17	11	6	54	59	35	60	64	57	49
Iceland	ISL	Europe and North America	C	40.1	8	80.1%	50.0%	22	16	6	77	81	95	96	60	92	50
India	IND	Central, Southern, Eastern and Southeast Asia	D	26.1	7	34.8%	75.0%	76	73	3	73	64	78	70	76	82	72
Indonesia	IDN	Central, Southern, Eastern and Southeast Asia	D	18.1	8	23.5%	77.0%	74	25	49	79	60	75	91	83	95	79
Ireland	IRL	Europe and North America	C	41.9	7	74.0%	56.7%	30	21	9	72	74	80	91	66	91	40
Islamic Republic of Iran	IRN	Central, Southern, Eastern and Southeast Asia	D	21.9	7	41.4%	52.9%	51	13	38	75	73	90	95	81	67	54
Israel	ISR	Northern Africa and Western Asia	F	7.1*	2	15.6%	45.5%	11	1	10	47	54	50	35	83	66	21
Italy	ITA	Europe and North America	D	20.7	6	55.1%	37.5%	80	3	77	69	67	65	84	66	89	51
Japan	JPN	Central, Southern, Eastern and Southeast Asia	D	20.9	8	49.9%	41.8%	67	7	60	77	57	80	91	65	90	96
Jordan	JOR	Northern Africa and Western Asia	E	20.4*†	4	33.9%	90.0%	10	10	0	58	60	75	44	70	80	36
Kenya	KEN	Sub-Saharan Africa	E	4.8*	6	7.0%	68.8%	16	11	5	68	57	60	72	64	82	79
Kiribati	KIR	Oceania	E	20.4*†	5	82.4%	90.9%	11	11	0	64	62	85	39	64	69	75
Kuwait	KWT	Northern Africa and Western Asia	F	2.0*	4	3.0%	68.8%	16	12	4	56	50	78	61	89	52	32
Latvia	LVA	Europe and North America	C	48.0	7	96.0%	50.0%	6	5	1	74	74	68	91	83	76	57
Lebanon	LBN	Northern Africa and Western Asia	F	1.8*	3	5.5%	33.3%	12	0	12	54	60	50	45	83	54	40
Liberia	LBR	Sub-Saharan Africa	E	2.9*	6	5.2%	56.5%	23	8	15	66	69	75	74	53	74	56
Lithuania	LTU	Europe and North America	D	18.9	7	94.6%	20.0%	5	3	2	73	72	95	89	73	79	43
Madagascar	MDG	Sub-Saharan Africa	E	9.4*	6	13.4%	70.0%	20	15	5	67	50	58	76	60	80	96
Malaysia	MYS	Central, Southern, Eastern and Southeast Asia	F	5.8*	5	7.8%	74.5%	55	21	34	61	40	68	68	89	95	40
Maldives	MDV	Central, Southern, Eastern and Southeast Asia	D	20.4*†	6	60.6%	72.2%	18	13	5	70	68	75	86	72	66	56
Malta	MLT	Europe and North America	D	18.4	7	53.8%	34.3%	35	2	33	71	80	68	88	75	83	40
Marshall Islands	MHL	Oceania	D	20.4*†	6	78.4%	72.7%	11	10	1	66	56	65	82	42	87	79
Mauritania	MRT	Sub-Saharan Africa	D	15.0	6	33.8%	44.4%	36	8	28	68	63	78	73	62	72	64
Mexico	MEX	Latin America and the Caribbean	D	17.8	6	30.3%	58.8%	51	19	32	68	42	88	72	78	66	92
Montserrat	MSR	Latin America and the Caribbean	E	11.5*	4	16.0%	71.4%	7	4	3	59	63	55	74	47	63	54
Morocco	MAR	Northern Africa and Western Asia	D	18.9	7	43.0%	44.0%	50	8	42	70	66	88	84	64	88	46
Mozambique	MOZ	Sub-Saharan Africa	E	0.3*	6	0.5%	68.8%	16	14	2	69	66	90	85	54	63	65

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Myanmar	MMR	Central, Southern, Eastern and Southeast Asia	E	1.1*	6	1.5%	75.0%	20	13	7	65	58	80	37	83	79	72
Namibia	NAM	Sub-Saharan Africa	D	31.0	7	65.1%	47.6%	21	7	14	70	68	90	95	69	89	33
Nauru	NRU	Oceania	E	20.4*†	5	95.2%	88.9%	9	8	1	62	52	75	82	43	89	49
Netherlands	NLD	Europe and North America	D	21.1	8	40.4%	52.2%	23	16	7	80	80	98	81	64	92	68
New Caledonia	NCL	Oceania	D	19.6*	8	22.1%	88.9%	9	7	2	76	67	75	85	83	78	75
New Zealand	NZL	Oceania	D	33.1	7	50.1%	66.1%	59	31	28	73	75	95	86	46	87	63
Nicaragua	NIC	Latin America and the Caribbean	E	1.7*	7	2.2%	75.0%	12	11	1	70	54	88	65	75	80	72
Nigeria	NGA	Sub-Saharan Africa	E	3.0*	6	4.2%	70.6%	17	8	9	68	63	65	67	66	78	74
Niue	NIU	Oceania	E	20.4*†	2	24.9%	100.0%	7	7	0	47	46	40	68	56	41	40
Northern Mariana Islands	MNP	Oceania	F	7.8*	3	11.1%	70.0%	10	9	1	50	33	55	47	63	74	46
Norway	NOR	Europe and North America	C	48.2	8	81.0%	59.5%	37	28	9	80	82	80	86	58	87	88
Oman	OMN	Northern Africa and Western Asia	E	38.3	5	54.0%	70.8%	24	13	11	64	62	63	65	69	95	42
Pakistan	PAK	Central, Southern, Eastern and Southeast Asia	E	21.2	4	27.0%	78.4%	37	13	24	59	52	73	36	69	65	78
Palau	PLW	Oceania	D	20.4*†	8	88.6%	60.0%	10	8	2	76	75	73	82	60	92	75
Panama	PAN	Latin America and the Caribbean	D	28.8	7	52.4%	54.8%	31	21	10	71	76	75	68	77	82	53
Papua New Guinea	PNG	Oceania	D	20.4*†	6	81.5%	63.6%	11	9	2	66	52	80	77	46	85	71
Peru	PER	Latin America and the Caribbean	D	59.1	4	91.9%	64.3%	28	11	17	56	50	88	67	47	63	36
Philippines	PHL	Central, Southern, Eastern and Southeast Asia	D	22.1	8	46.2%	47.9%	48	6	42	79	67	90	74	81	76	96
Pitcairn	PCN	Oceania	F	3.5*	3	3.9%	88.9%	9	8	1	52	43	40	27	70	77	83
Portugal	PRT	Europe and North America	E	34.0	3	51.9%	65.6%	32	17	15	62	74	78	64	78	86	22
Republic of Korea	KOR	Central, Southern, Eastern and Southeast Asia	D	13.6	8	28.2%	48.0%	25	5	20	75	52	85	82	73	87	92
Russian Federation	RUS	Europe and North America	D	30.6	6	59.3%	51.6%	31	12	19	70	60	93	91	54	69	67
Saint Vincent and the Grenadines	VCT	Latin America and the Caribbean	E	26.8	3	37.5%	71.4%	14	7	7	54	70	90	39	33	62	44
Samoa	WSM	Oceania	D	18.9*†	7	34.6%	54.5%	11	8	3	72	77	80	72	44	74	92
São Tomé and Príncipe	STP	Sub-Saharan Africa	E	18.7*	4	28.0%	66.7%	15	8	7	57	69	68	35	63	66	49
Saudi Arabia	SAU	Northern Africa and Western Asia	E	11.2*	5	21.5%	51.9%	27	13	14	60	66	50	43	59	85	63
Senegal	SEN	Sub-Saharan Africa	E	9.4	6	21.3%	44.4%	36	8	28	66	69	65	60	44	83	79
Seychelles	SYC	Sub-Saharan Africa	D	20.4*†	6	38.8%	75.0%	20	13	7	67	74	75	75	53	67	58
Sierra Leone	SLE	Sub-Saharan Africa	D	24.1	6	39.0%	61.9%	21	8	13	70	63	68	80	53	85	75
Slovenia	SVN	Europe and North America	D	29.7	7	83.0%	35.7%	14	0	14	71	77	85	87	72	82	36
Solomon Islands	SLB	Oceania	D	20.4*†	6	75.9%	77.8%	9	8	1	66	57	83	77	40	83	71
Somalia	SOM	Sub-Saharan Africa	F	5.7*	1	14.1%	40.7%	27	14	13	45	72	50	21	37	66	35
South Africa	ZAF	Sub-Saharan Africa	D	32.7	8	62.7%	52.2%	46	22	24	79	76	93	90	78	71	68
Spain	ESP	Europe and North America	D	26.1	8	53.2%	49.1%	108	24	84	78	73	75	88	78	93	65
Sudan	SDN	Northern Africa and Western Asia	E	2.2*	6	2.4%	90.9%	11	11	0	67	69	73	61	57	63	85
Sweden	SWE	Europe and North America	D	38.1	8	90.1%	42.3%	26	20	6	76	77	83	91	74	82	54
Taiwan (Province of China)	TWN	Central, Southern, Eastern and Southeast Asia	D	15.4	6	46.3%	33.3%	39	8	31	69	49	78	87	68	97	54
Thailand	THA	Central, Southern, Eastern and Southeast Asia	E	7.9	7	11.6%	68.0%	25	10	15	72	67	83	89	56	81	65
Timor-Leste	TLS	Central, Southern, Eastern and Southeast Asia	E	20.4*†	2	45.4%	80.0%	15	13	2	47	61	53	28	53	72	26
Tokelau	TKL	Oceania	E	20.4*†	2	77.1%	85.7%	7	7	0	49	37	45	83	51	63	32
Tonga	TON	Oceania	D	16.5*	6	22.4%	73.3%	15	12	3	67	52	80	78	37	95	85
Tunisia	TUN	Northern Africa and Western Asia	D	18.8	6	38.2%	49.1%	57	2	55	65	60	75	67	78	62	57
Turkey	TUR	Northern Africa and Western Asia	E	16.1	5	72.6%	22.2%	36	2	34	61	53	65	54	78	63	65
Turks and Caicos Islands	TCA	Latin America and the Caribbean	D	44.6	2	89.2%	50.0%	10	6	4	47	52	55	40	44	65	33
Tuvalu	TUV	Oceania	D	20.4*†	6	89.5%	88.9%	9	9	0	69	65	70	80	42	86	83
Ukraine	UKR	Europe and North America	E	12.1	3	54.4%	22.2%	9	1	8	53	60	70	71	67	72	15
United Arab Emirates	ARE	Northern Africa and Western Asia	D	20.1*†	8	30.2%	66.7%	18	12	6	76	69	68	70	89	92	78
United Kingdom of Great Britain and Northern Ireland	GBR	Europe and North America	D	35.6	9	72.2%	49.3%	73	52	21	83	79	85	90	70	90	85
United Republic of Tanzania	TZA	Sub-Saharan Africa	E	9.5*	7	12.4%	76.5%	17	12	5	74	66	85	80	68	78	71
United States of America	USA	Europe and North America	C	45.0	8	73.2%	61.5%	179	122	57	77	55	93	91	62	93	88
United States Virgin Islands	VIR	Latin America and the Caribbean	F	8.2*	4	10.6%	77.8%	9	7	2	57	36	63	72	67	82	43
Uruguay	URY	Latin America and the Caribbean	E	38.7	5	74.5%	52.0%	25	15	10	63	63	68	76	64	67	46
Vanuatu	VUT	Oceania	D	20.4*†	6	44.1%	83.3%	12	12	0	68	59	75	76	43	90	79
Viet Nam	VNM	Central, Southern, Eastern and Southeast Asia	F	1.3*	3	2.2%	61.9%	21	10	11	56	66	45	27	64	80	65
Wallis and Futuna Islands	WLF	Oceania	E	20.4*†	3	49.3%	85.7%	7	7	0	54	50	55	50	70	59	46

GLOSSARY

KEY TERMS AND CONCEPTS

Fish stock is a population of a single, or sometimes combined, fish species living in a defined area from which catches are taken in a fishery.

Flag state is any country, landlocked or coastal, that registers a fishing vessel and authorises the vessel to fly its flag.[56]

Maximum sustainable yield (MSY) is the highest theoretical equilibrium yield (catch) that can be continuously removed from a stock (on average), under existing (average) environmental conditions, without significantly affecting the reproduction process. Based on the Schaefer model,[57] MSY is predicted to occur at 50 per cent of unfished levels of abundance. When classifying a fish stock, we apply a 10 per cent margin of error to this threshold to account for uncertainties in the data and model estimates.

Nationally managed catch includes catches from fish stocks that occur completely within a country's national waters (national stocks) or are a shared responsibility of neighbouring countries (shared stocks). This excludes catch from stocks that are managed by one of the five tuna RFMOs: the Commission for the Conservation of Southern Bluefin Tuna, the Inter-American Tropical Tuna Commission, the International Commission for the Conservation of Atlantic Tuna, the Indian Ocean Tuna Commission and the Western and Central Pacific Fisheries Commission.

National stocks are located entirely within a country's national waters (i.e. coastal waters, territorial sea and exclusive economic zone).

An **overfished stock** has an estimated relative abundance below the level that can produce MSY (that is, less than 40 per cent of unfished levels of abundance) or has a relative value of spawning stock biomass that is less than 20 per cent of the unfished level.

Reconstructed catch combines reported 'official' catch estimates with other information (such as trade records, seafood consumption rates, national employment data and vessel registries) to provide a more comprehensive and accurate estimate of total marine catch within a country's national waters. We use the Sea Around Us[58] reconstructed catch time series in our analyses.

Shared stocks occur within the national waters of multiple adjacent countries.

Stock abundance, measured in biomass (B), is used to classify stock status by comparing estimates of current abundance (B) relative to unfished abundance (B_0).

Stock assessments use biological information, fishery data such as catch statistics and fishing effort, and where available, scientific survey data to estimate population dynamics of fish stocks. **Official stock assessments** in our dataset include stock assessments conducted by a national fisheries authority or scientific body, such as the National Oceanic and Atmospheric Administration, the International Council for the Exploration of the Sea, or RFMOs, with published relative abundance estimates available.

Straddling stocks move across exclusive economic zone boundaries, often into the high seas, and are caught by multiple countries (for example, tuna, swordfish).

A **sustainable stock** has an estimated relative abundance at or above the level that can produce MSY (that is, greater than or equal to 40 per cent of unfished levels of abundance) or has a relative value of spawning stock biomass that is greater than or equal to 20 per cent of the unfished level.

Unassessed catch refers to catch harvested from an unmonitored stock for which no reliable estimates of current abundance exist, or which lacks the necessary data to estimate stock abundance using the data-limited approaches applied.

ABBREVIATIONS

BSM	Bayesian Schaefer Model
FAO	Food and Agriculture Organization of the United Nations
GDP PPP	Gross Domestic Product Purchasing Power Parity
IUU fishing	Illegal, unreported and unregulated fishing
MSY	Maximum sustainable yield
NGO	Non-government organisation
OECD	Organisation for Economic Co-Operation and Development
RFMO	Regional Fisheries Management Organisation
SSB	Spawning stock biomass
SDG	Sustainable Development Goals

ENDNOTES

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41 65 countries score 50 or higher in either Governance Indicator 2.2.4: 'Prevalence of science-based catch and/or effort limits

42 123 countries score 25 or higher in both Governance Indicators 5.1.2: 'Use of targeted on-land or in-port inspections' or 5.1.3: 'Use of targeted on-water inspections'

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