



# FishStat

FAO FISHERY AND  
AQUACULTURE STATISTICS

## *Session V: Sustainable Fishing, Livelihoods and Life Under Water – SDG 14*

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With acknowledgments to Anne-Elise Nieblas

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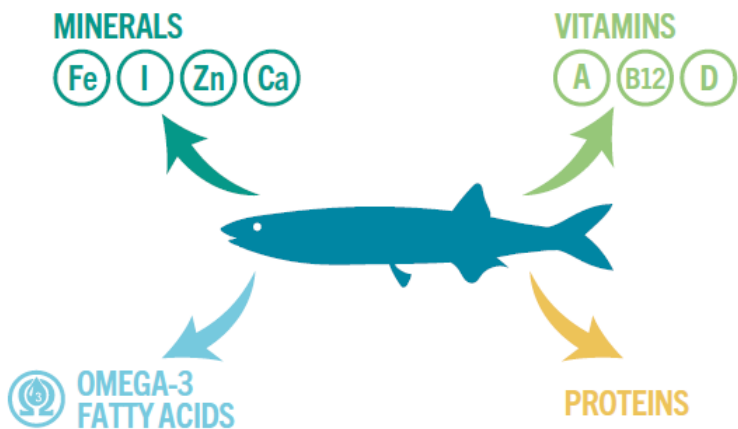




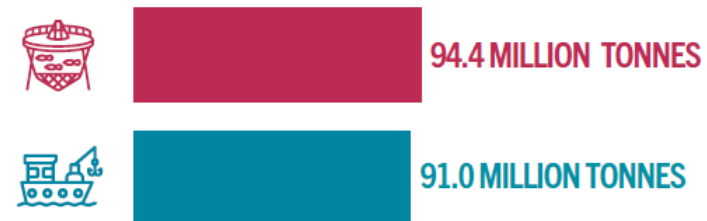
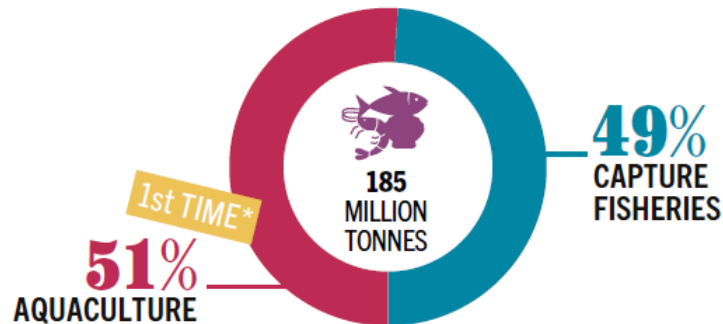
# Why are oceans, seas and marine resources so important?

- Food
- Employment
- Oxygen supply
- Regulators of climate change
- Marine habitats
- Recreational and tourism activities

# Background

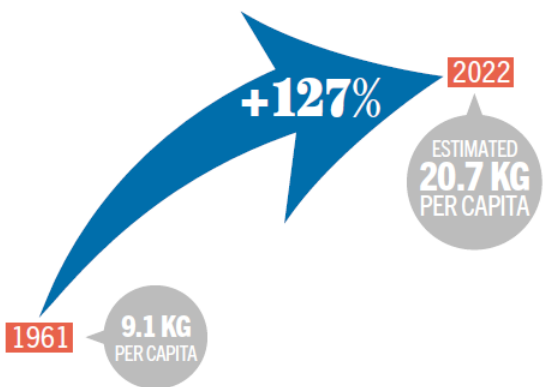


## WORLD AQUATIC ANIMAL PRODUCTION

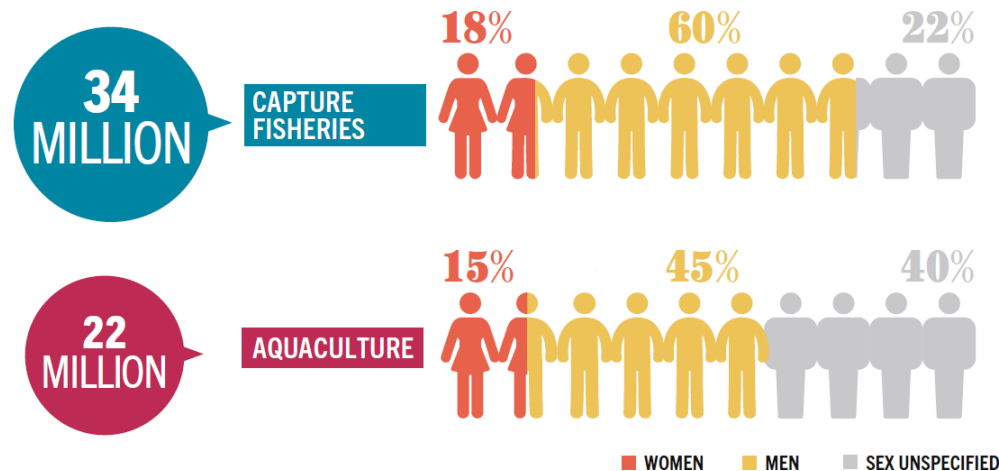


\* Farmed aquatic animals for the first time ever exceeded captured aquatic animals by volume.

## WORLD APPARENT CONSUMPTION OF AQUATIC ANIMAL FOODS PER CAPITA PER YEAR

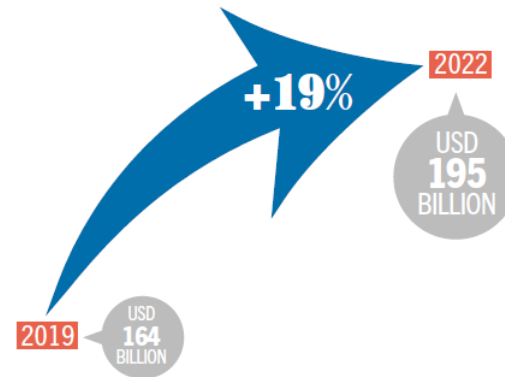


## FISHERS AND FISH FARMERS IN THE PRIMARY SECTOR\*

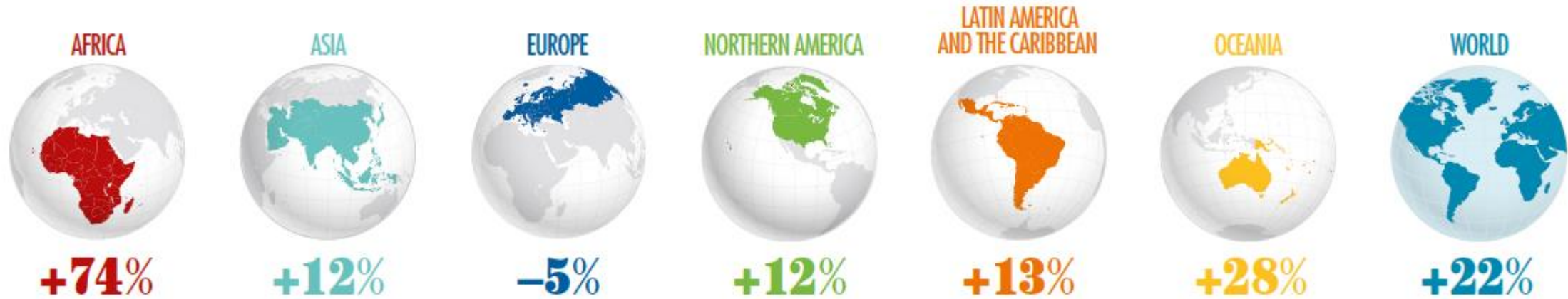


\* Excluding 6 million unspecified workers.

## INTERNATIONAL TRADE OF AQUATIC PRODUCTS



## NEED FOR GROWTH IN SUPPLY OF AQUATIC ANIMAL FOODS BY 2050\*



\* Supply needed to sustain current per capita consumption scenario.

- Any growth in production will have to be achieved in the midst of many additional challenges on marine and inland ecosystems including climate change, pollution, habitat destruction, and unsustainable practices.



# The main threats to oceans and seas

- Human activities
  - Marine pollution and litter
  - Sea water acidification
    - Part of the carbon dioxide released through human activities is absorbed by the oceans which leads to ocean acidification.
  - Destructive fishing practices and overfishing
    - Overfishing occurs when there is too much fishing effort or fishing pressure on a stock or stocks
  - Harmful fisheries subsidies
- Climate change
  - Affects distribution and productivity of marine fish stocks
  - As water continue to warm globally, fish stocks are shifting to cooler waters towards the poles and to deeper waters. This is having a disproportionate negative effect on tropical fisheries and on SIDS.





# Overview of Goal 14: Life below water

**TARGET 14.1**

REDUCE  
MARINE  
POLLUTION



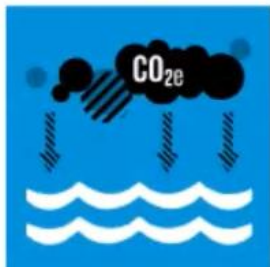
**TARGET 14.2**

PROTECT  
AND  
RESTORE  
ECOSYSTEMS



**TARGET 14.3**

REDUCE  
OCEAN  
ACIDIFICATION



**TARGET 14.4**

SUSTAINABLE  
FISHING



**TARGET 14.5**

CONSERVE  
COASTAL  
AND MARINE  
AREAS



**TARGET 14.6**

END SUBSIDIES  
CONTRIBUTING  
TO  
OVERFISHING



**TARGET 14.7**

INCREASE  
ECONOMIC  
BENEFITS FROM  
SUSTAINABLE  
USE OF MARINE  
RESOURCES



**TARGET 14.8**

INCREASE  
SCIENTIFIC  
KNOWLEDGE,  
RESEARCH AND  
TECHNOLOGY  
FOR OCEAN  
HEALTH



**TARGET 14.B**

SUPPORT  
SMALL-  
SCALE  
FISHERS



**TARGET 14.A**

IMPLEMENT AND  
ENFORCE  
INTERNATIONAL  
SEA LAW





# Target 14.4

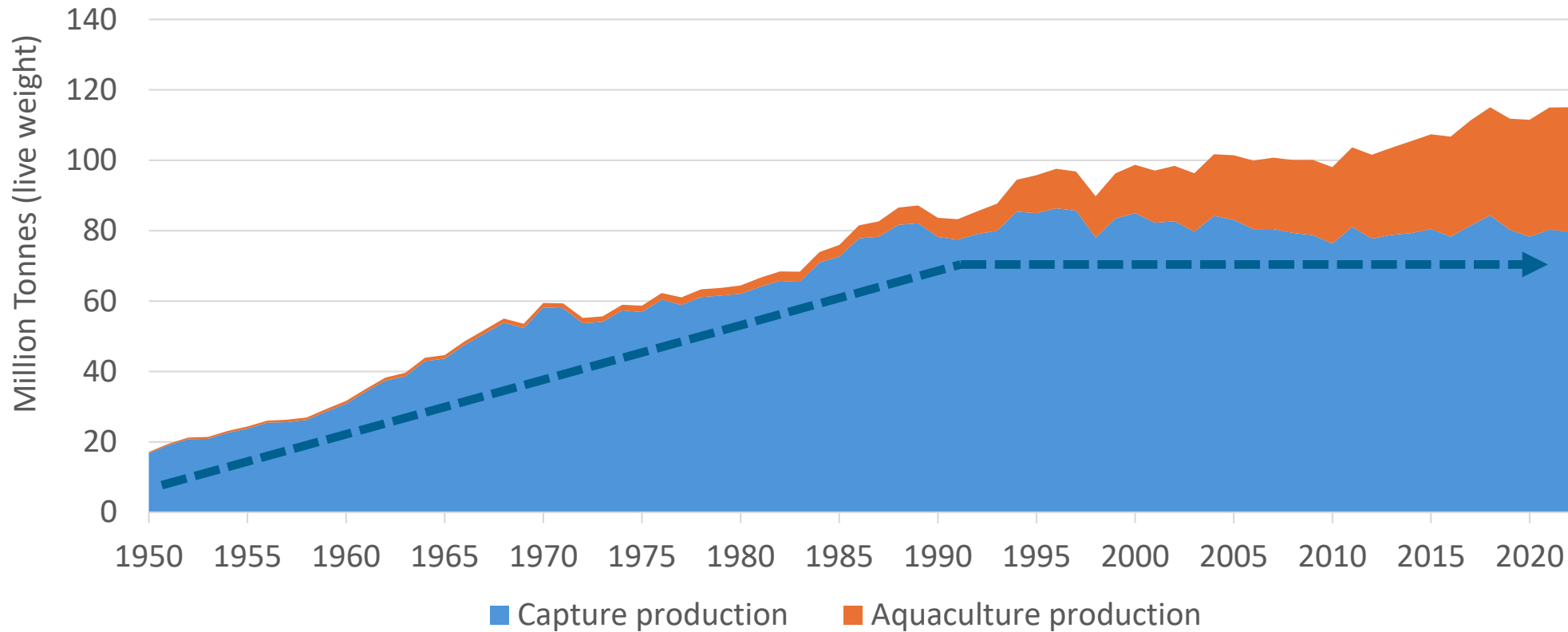
- Target 14.4:
  - effectively regulate harvesting
  - end overfishing, illegal, unreported and unregulated (IUU) fishing and destructive fishing practices
  - implement science-based management plans

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.



# Growing aquatic animal production in marine areas

Global aquatic animal production in marine areas – Million tonnes live weight



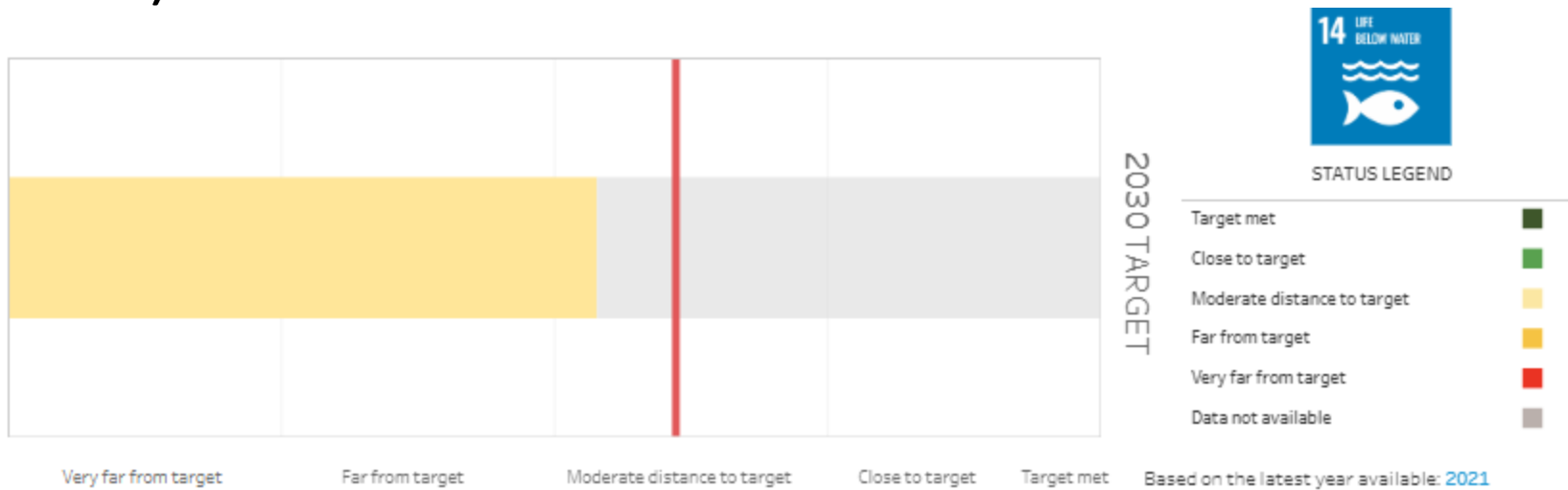
Source: FAO. 2024

# MARINE CAPTURE: VITAL PRODUCTION GLOBALLY STABLE, BUT SUSTAINABILITY REMAINS A CONCERN



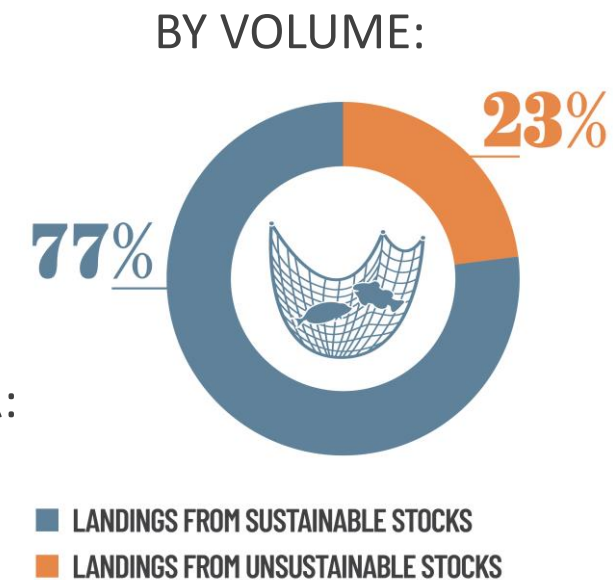
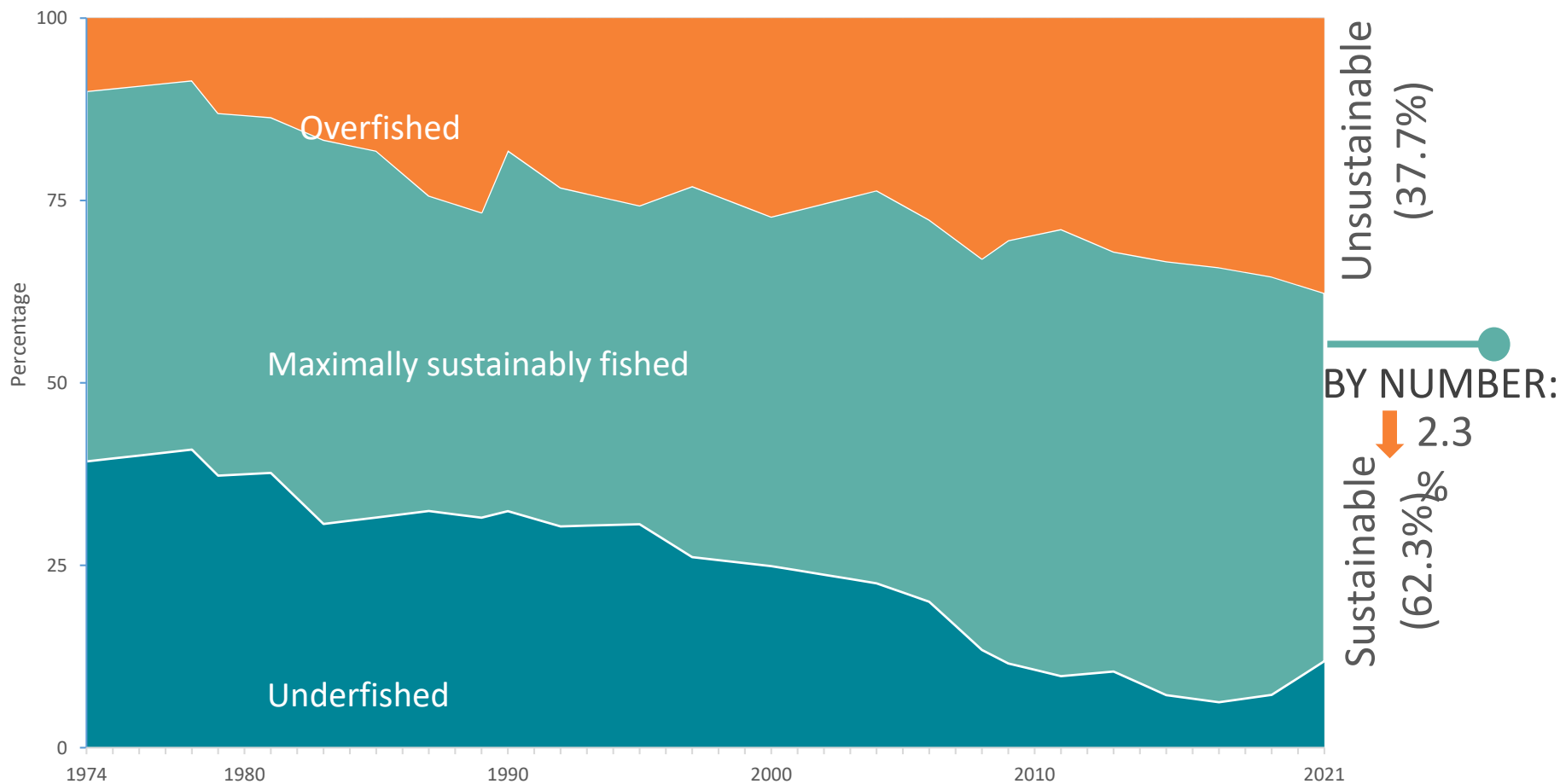
# Indicator 14.4.1 – Global level

Proportion of fish stocks within biologically sustainable levels (not overfished)



# Global trends in the state of the world's marine fish stocks

Indicator 14.4.1 - global level - 1974-2021

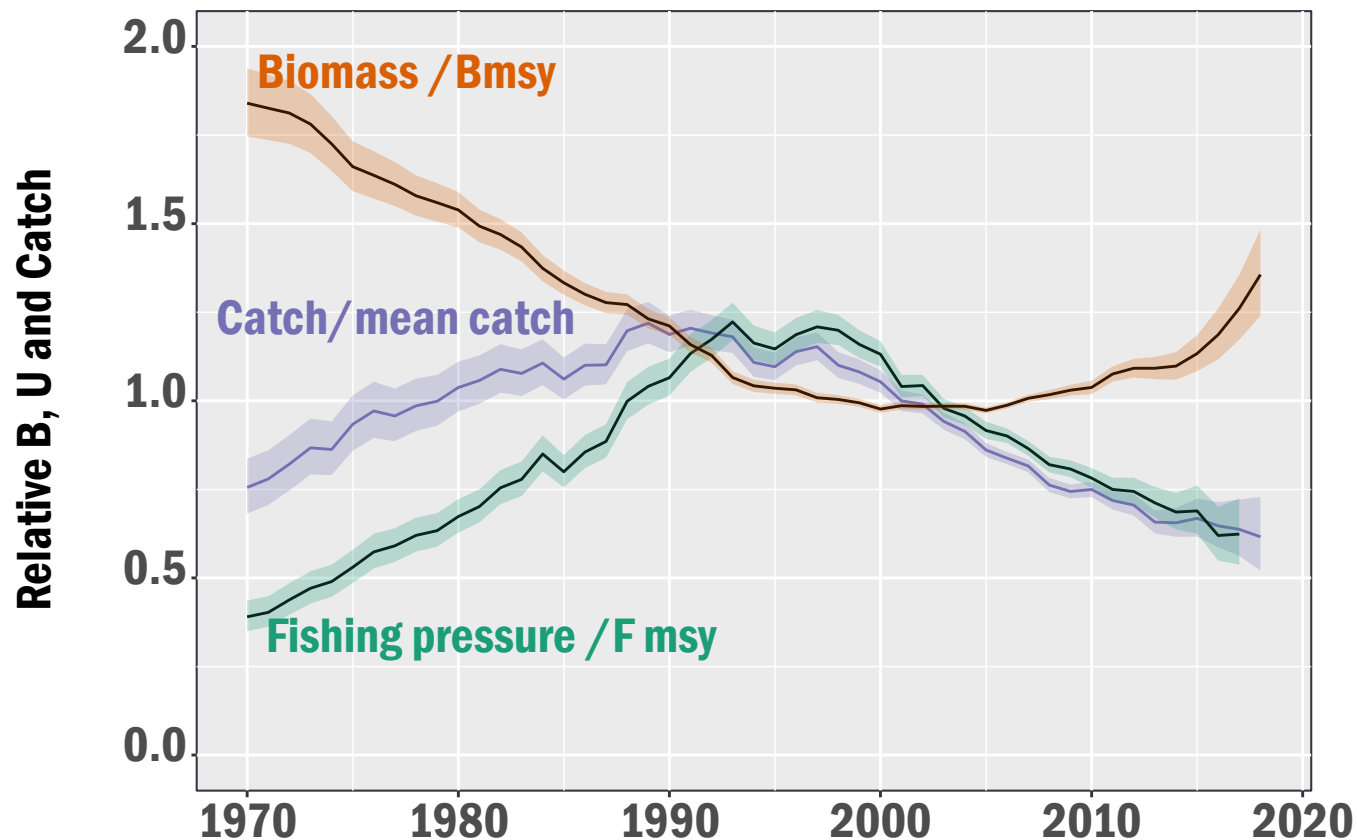


Source: FAO. SOFIA 2024

**LARGER STOCKS MONITORED BY FAO TEND TO BE BETTER MANAGED**



# Fisheries Management works, if implemented



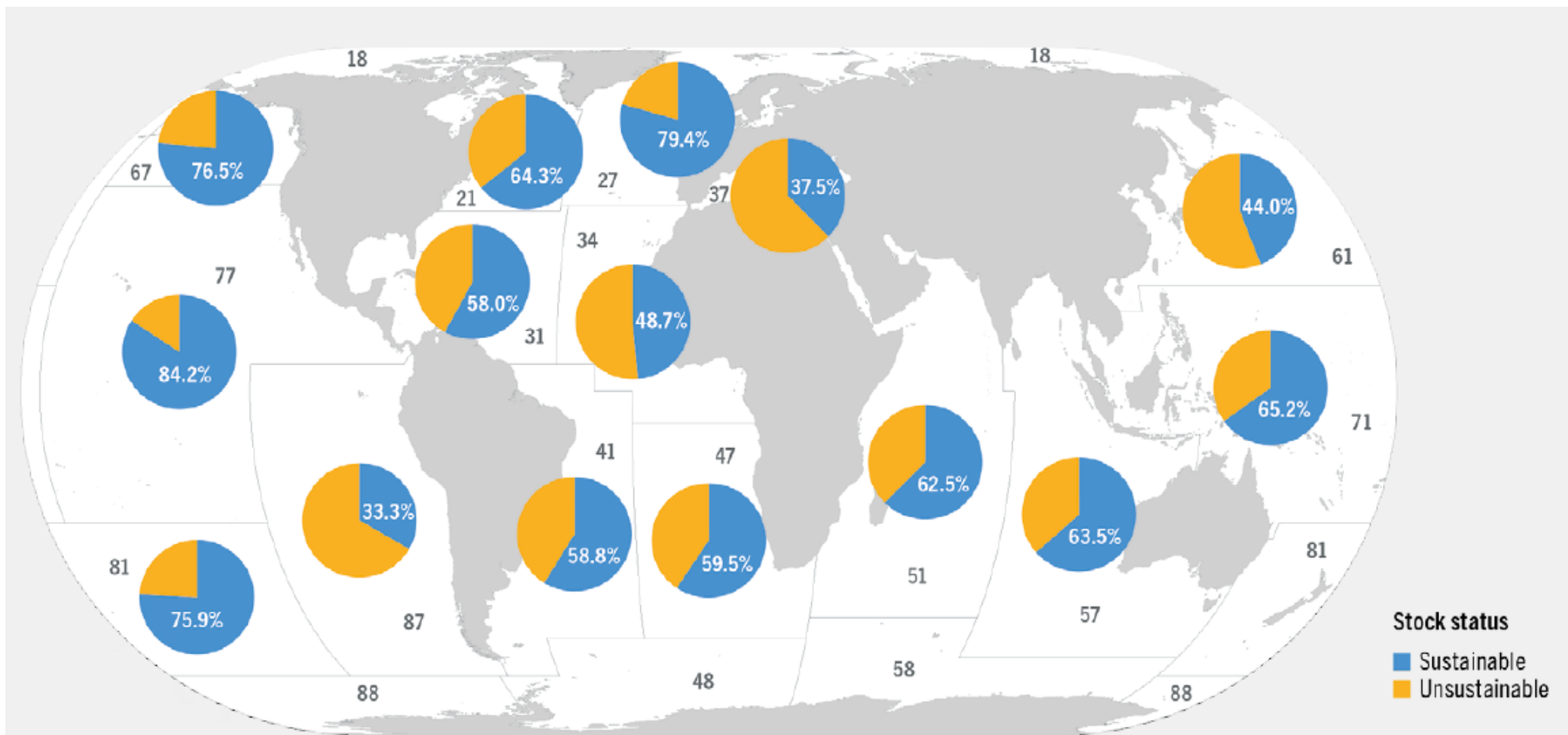
- “Assessed stocks” are improving and rebuilding; Unassessed stocks are declining
- Unassessed fisheries face challenges in data availability, technical capacity and management governance
- Our target should be to assess and effectively manage 100% of fishery stocks

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**STOCKS UNDER INTENSE MANAGEMENT ARE INCREASINGLY SUSTAINABLE OR REBUILDING**

# Indicator 14.4.1 – Regional level

Percentages of biologically sustainable and unsustainable fishery stocks by FAO major fishing area, 2021



NOTE: The percentages represent the proportion of sustainable stocks.

SOURCE: FAO SOFIA 2024. FAO estimates



# Stock assessment remains insufficient

- Globally about 40% of stocks with unknown status.



# Assisting countries to monitor and report on 14.4.1

- FAO piloted national-level questionnaire to quantify fishery stocks within biologically sustainable levels in 2019 and 2022 with the aim of facilitating a consistent reporting
- Information collected on stock identity, assessment information, stock status, time series data (optional)





## Indicator 14.4.1 – Results National level

- Participation rate rising: 99 respondents in 2022 compared with 87 in 2019.
- Improved data quality: 47 countries passed Q1 and Q2 quality assurance (reliability and robustness) in 2022 compared with 31 in 2019.
- Challenges remain



# Major obstacles for assessing more stocks

- Cost
- Available information
- Technical capacity

=> Need for simple methods that can rapidly provide some indication on the status of stocks

↔ data-limited methods

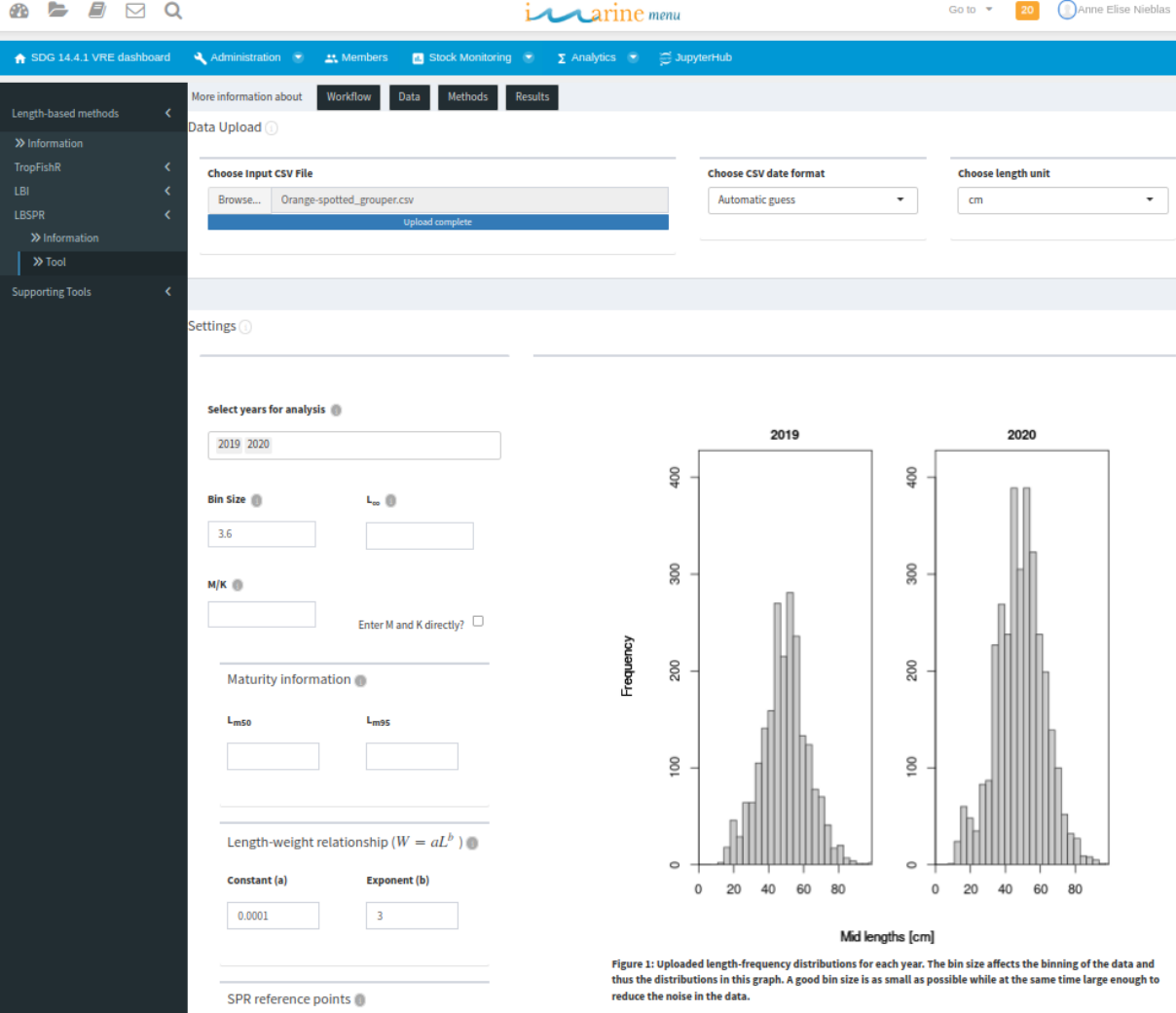


# FAO's role in supporting countries

- FAO developed new methodologies for assessment in data-limited situations
- E-learning course SDG Indicator 14.4.1 available in multiple languages
- Strengthen dissemination of available information on individual stock status through FIRMS
- Organization of regional hands-on trainings between 2019 and 2022
  - Online VRE platform
  - Rshiny Stock Monitoring Tool

# Stock Monitoring Tool (SMT)

- Online Rshiny app to access, test, and run **data-limited fish stock assessment methods** for training purposes
  - Catch-Only Maximum Sustainable Yield (CMSY)
  - FAO length-based methods (Elefan, SBPR/YPR)
  - Length-based indicators (LBIs)
  - Length-based Spawning Potential Ratio (LBSPR)
- Guided, informative, supported by tutorials and help-desk sessions



The screenshot displays the SMT web application interface. At the top, there is a navigation bar with 'SDG 14.4.1 VRE dashboard', 'Administration', 'Members', 'Stock Monitoring', 'Analytics', and 'JupyterHub'. A sidebar on the left lists 'Length-based methods' including 'TropFishR', 'LBI', 'LBSPR', and 'Supporting Tools'. The main content area is titled 'Data Upload' and includes a 'Choose Input CSV File' section with a file browser showing 'Orange-spotted grouper.csv' and an 'Upload complete' button. To the right, there are dropdowns for 'Choose CSV date format' (Automatic guess) and 'Choose length unit' (cm). Below the upload section is a 'Settings' section with 'Select years for analysis' (2019 2020), 'Bin Size' (3.6), 'M/K' field, 'Maturity information' (Lms0, Lm95), 'Length-weight relationship (W = aL<sup>b</sup>)' (Constant (a) = 0.0001, Exponent (b) = 3), and 'SPR reference points'.

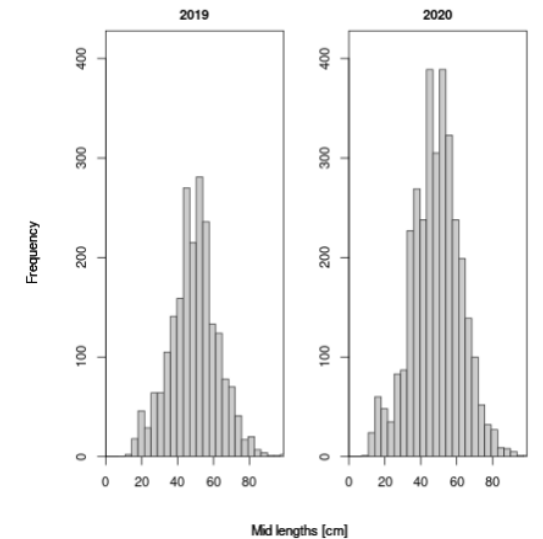


Figure 1: Uploaded length-frequency distributions for each year. The bin size affects the binning of the data and thus the distributions in this graph. A good bin size is as small as possible while at the same time large enough to reduce the noise in the data.





# BLUE TRANSFORMATION

A VISION FOR A MORE  
SUSTAINABLE, PRODUCTIVE,  
EQUITABLE AND IMPACTFUL  
SECTOR.



# AQUATIC SYSTEMS AS A SOLUTION: THE NEED FOR BLUE TRANSFORMATION



## OBJECTIVE 1

Sustainable aquaculture intensification and expansion satisfies global demand for aquatic foods and distributes benefits equitably.

## OUTCOME

Sustainable aquaculture production grows by at least 35 percent by 2030, especially in food deficit regions.



## OBJECTIVE 2

Effective management of all fisheries delivers healthy stocks and secures equitable livelihoods.

## OUTCOME

100 percent of marine and inland fisheries is under effective management and IUU fishing is eradicated.



## OBJECTIVE 3

Upgraded value chains ensure the social, economic and environmental viability of aquatic food systems.

## OUTCOME

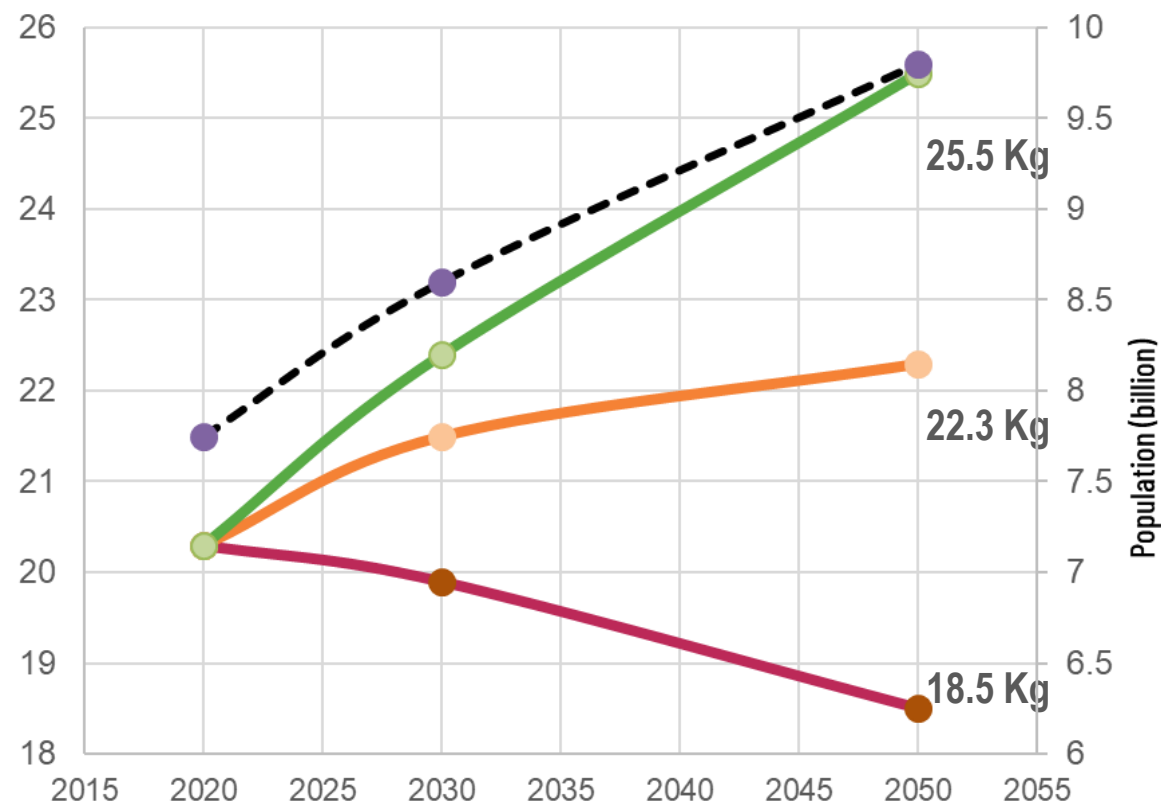
Loss and waste halved by 2030, more transparency and traceability, better market access, more equitable returns.

# BLUE TRANSFORMATION: MEETING EXPECTATIONS



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Per capita consumption (kg/yr)  
(Scenarios to 2050)



■ Baseline   
 ■ Blue transformation   
 ■ Failure to transform





Thank you ▪ Merci  
Благодарю ▪ ¡Muchas gracias!  
謝謝 ▪ اركش

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<https://www.fao.org/fishery/en/statistics>