UK Irrigation Association

An independent organisation promoting the wise use of water for irrigation

Water, land and food-State of affairs and the outlook

Olcay Ünver, Ph.D.
Arizona State University and Water Policy Group

UKIA Summer conference

Building resilience and sustainability in irrigated agriculture in UK

Is water for food still the 'missing link' in water resources planning?

Wednesday 6 July 2022

WATER POLICY GROUP

2021 GLOBAL WATER POLICY REPORT

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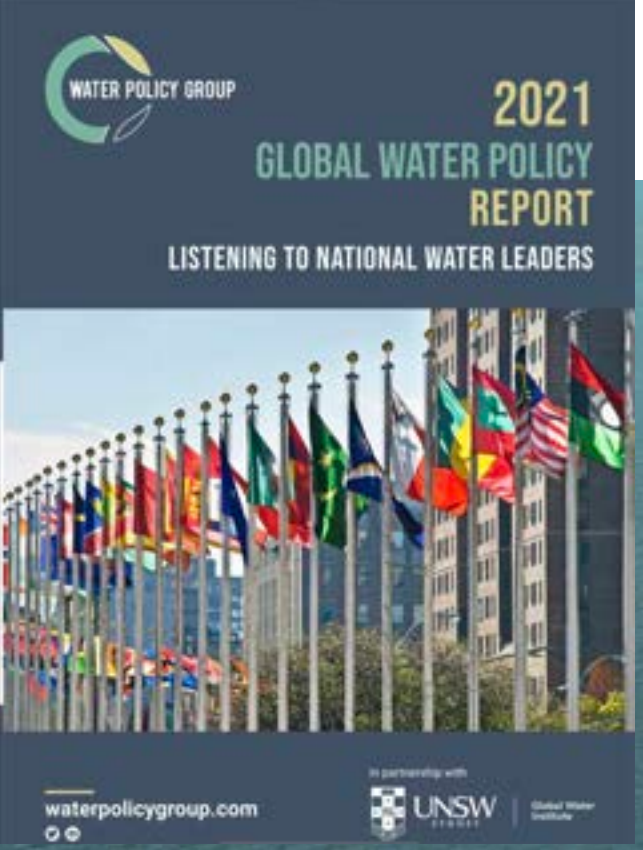
UNSW SYDNEY | Global Water Institute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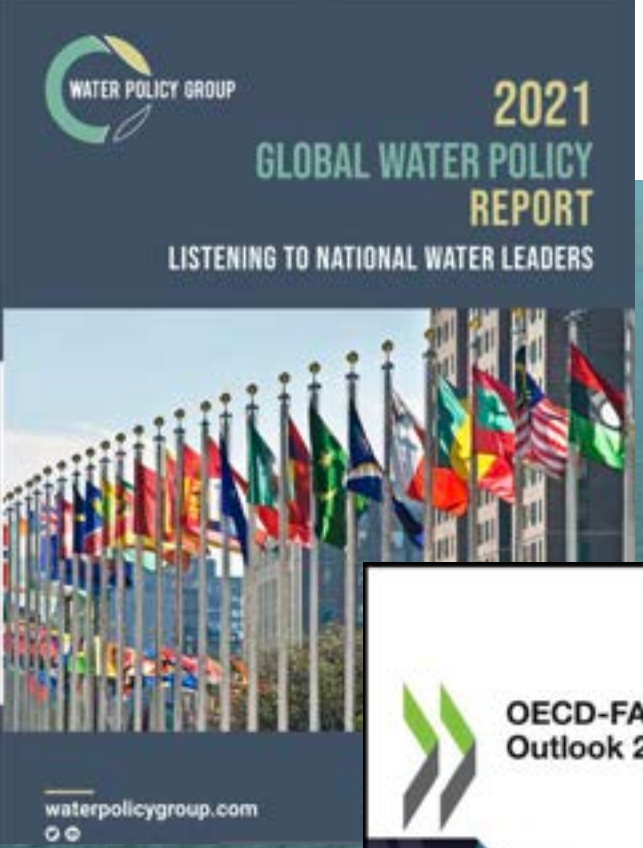
MAIN REPORT
THE STATE OF THE WORLD'S LAND AND WATER RESOURCES FOR FOOD AND AGRICULTURE 2021
Systems at breaking point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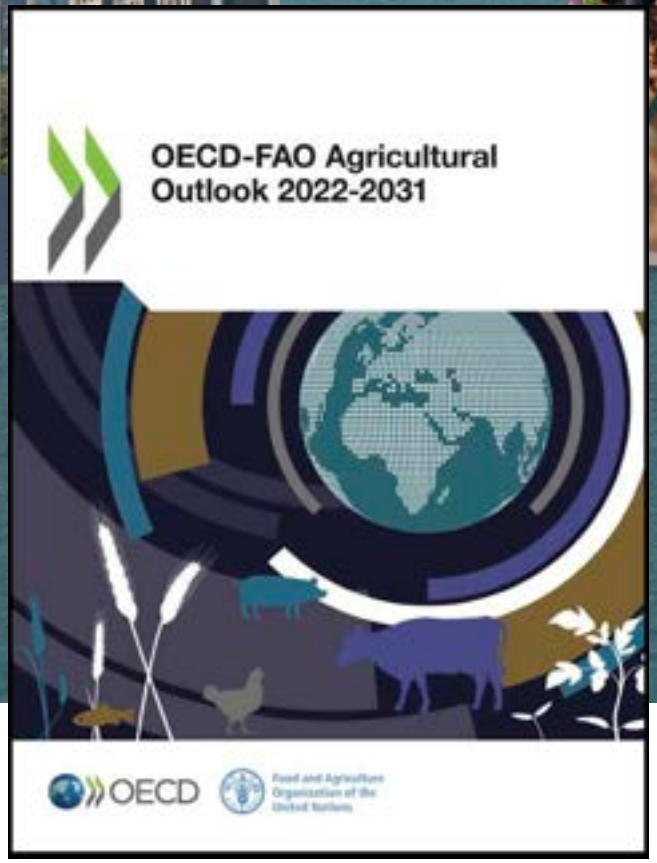
OECD-FAO Agricultural Outlook 2022-2031
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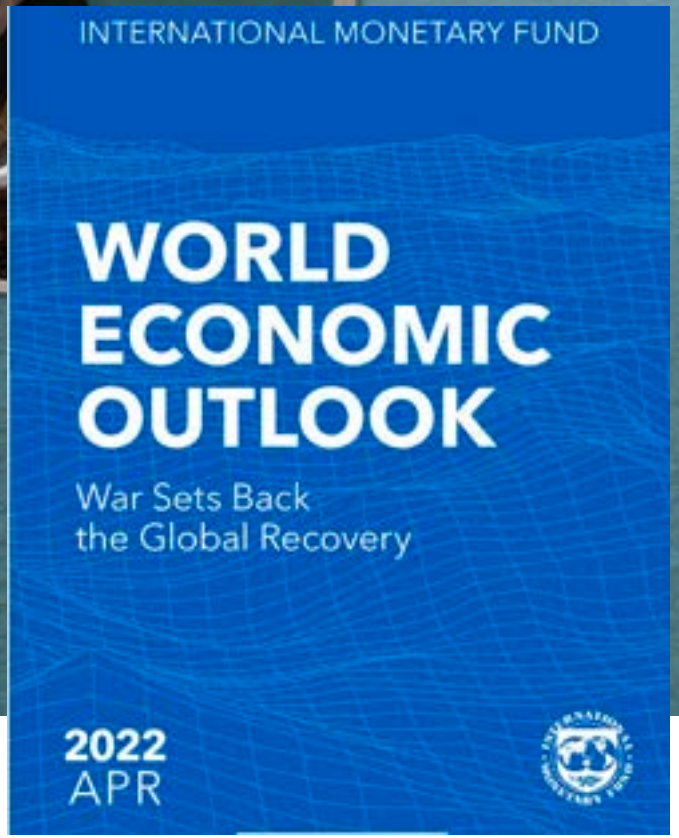
Food and Agriculture Organization of the United Nations


INTERNATIONAL MONETARY FUND
WORLD ECONOMIC OUTLOOK
War Sets Back the Global Recovery
2022
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Sustainable Development Goal 6
Synthesis Report on Water and Sanitation

2018

6 CLEAN WATER AND SANITATION

United Nations

Summary Progress Update 2021: SDG 6 — water and sanitation for all

JULY 2021

United Nations | UN WATER

SUMMARY PROGRESS 2021: SDG 6 INDICATORS

United Nations | UN WATER

July 2021

6.1.1 DRINKING WATER

2 billion people — 26% of the world's population — lacked safely managed drinking water services in 2020

6.2.1a SANITATION

3.6 billion people — 46% of the world's population — lacked safely managed sanitation services, and 494 million people practised open defecation, in 2020

6.2.1b HYGIENE

2.3 billion people — 29% of the world's population — lacked a basic handwashing facility with soap and water at home in 2020

6.3.1 WASTEWATER

Globally 44% of household wastewater is not safely treated

6.3.2 WATER QUALITY

The lack of water quality data for over 3 billion people means that they are at significant risk because the health of their rivers, lakes and groundwater is unknown

https://www.unwater.org/sdg6-update-the-world-is-off-track/

Since 2015 water-use efficiency has increased by

10% globally

2.3 billion people live in water-stressed countries

of which **733 million** live in high and critically water-stressed countries

6.5.1 INTEGRATED WATER MANAGEMENT

107 countries are **not on track** to have sustainably managed water resources by 2030

Globally, the current rate of progress needs to be doubled

6.5.2 TRANSBOUNDARY COOPERATION

Only **24** countries reported that all the rivers, lakes and aquifers that they share with their neighbours are covered by operational arrangements for cooperation

6.6.1 ECOSYSTEMS

1/5 of the world's river basins are experiencing rapid changes in the area covered by surface waters

6.a.1 INTERNATIONAL COOPERATION

Official development assistance (ODA) commitments to the water sector increased

9% from 2015 to 2019, but disbursements showed little change

6.b.1 PARTICIPATION

Only **14** countries out of **109** report having high levels of participation by communities in water and sanitation decision-making

https://www.unwater.org/sdg6-update-the-world-is-off-track/

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2022 AFRICA WATER POLICY REPORT

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2022 ASIA-PACIFIC WATER POLICY REPORT

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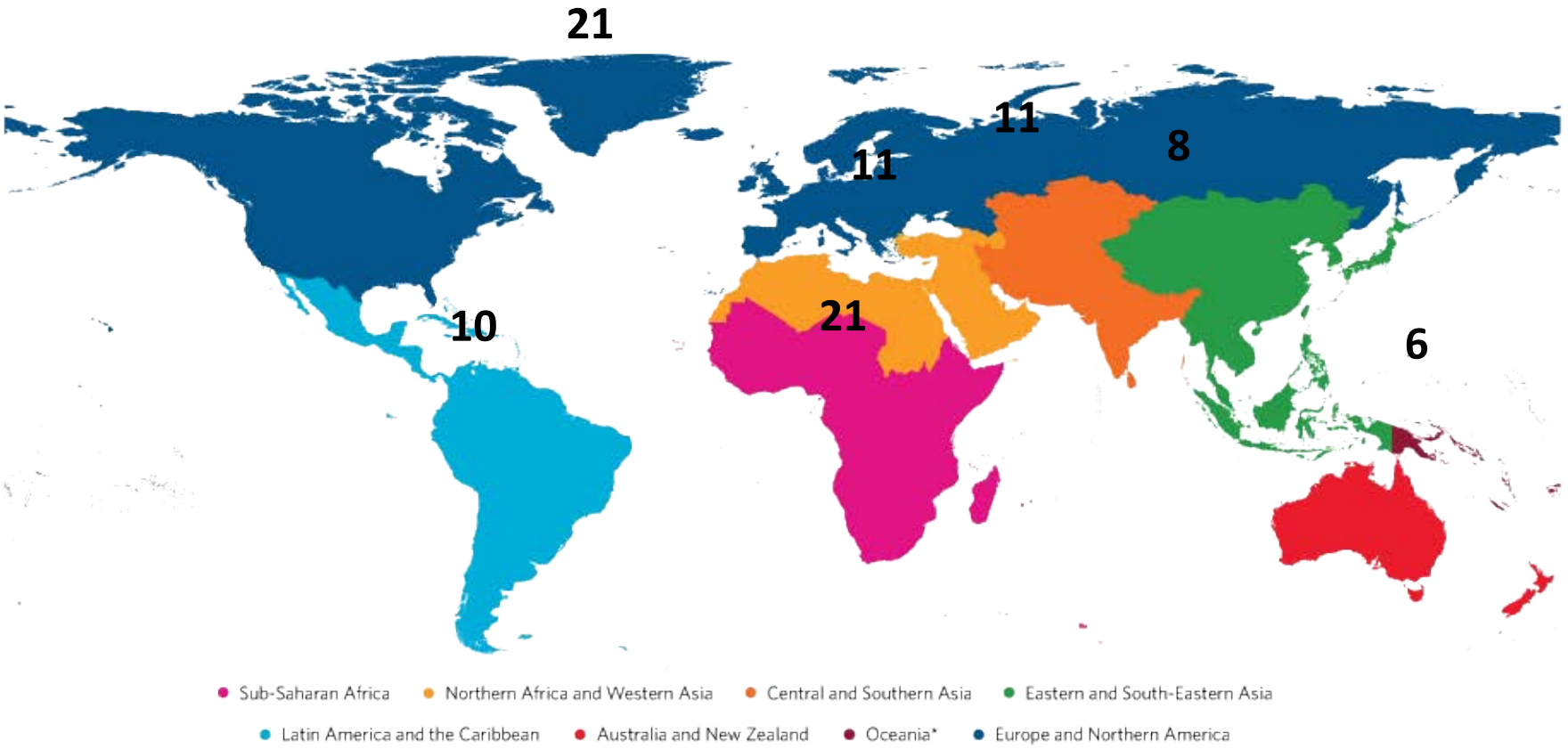
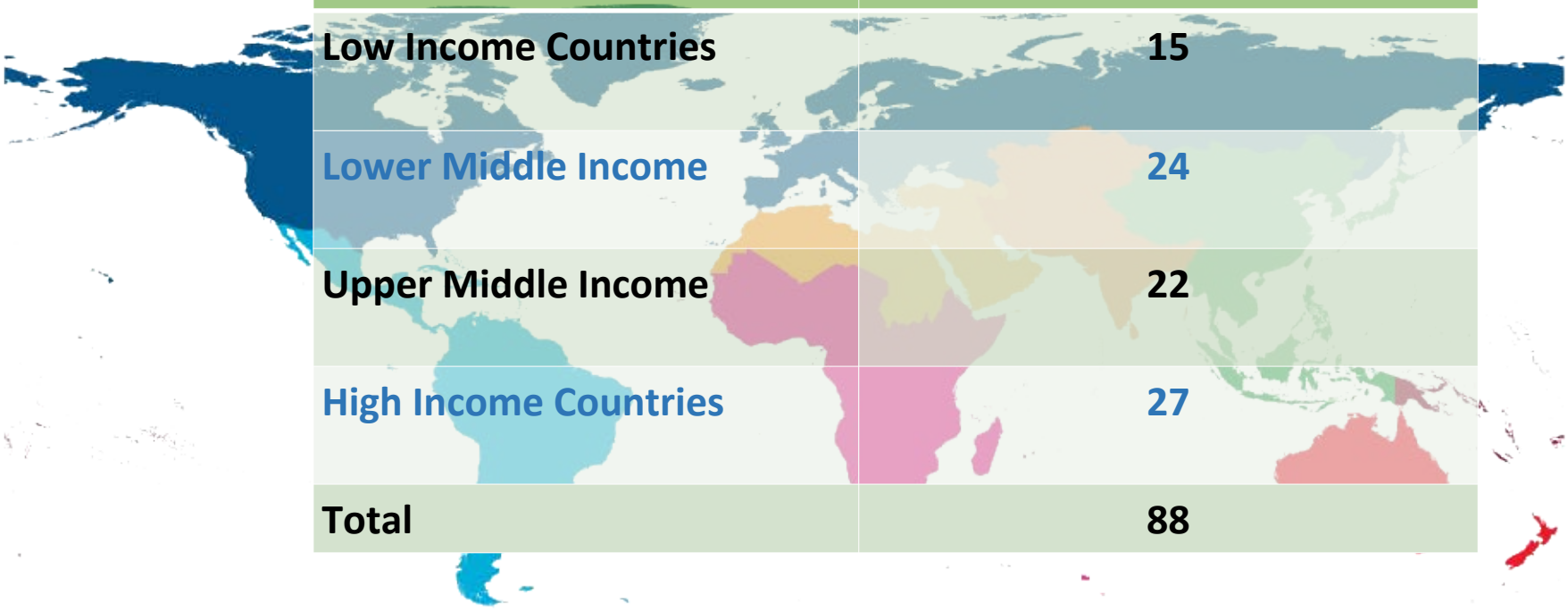
Survey's geographical coverage – United Nations Regions



Notes: • Oceania* refers to Oceania excluding Australia and New Zealand throughout the publication.
• The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

ncome Category	No. of Countries
Low Income Countries	15
Lower Middle Income	24
Upper Middle Income	22
High Income Countries	27
Total	88



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58

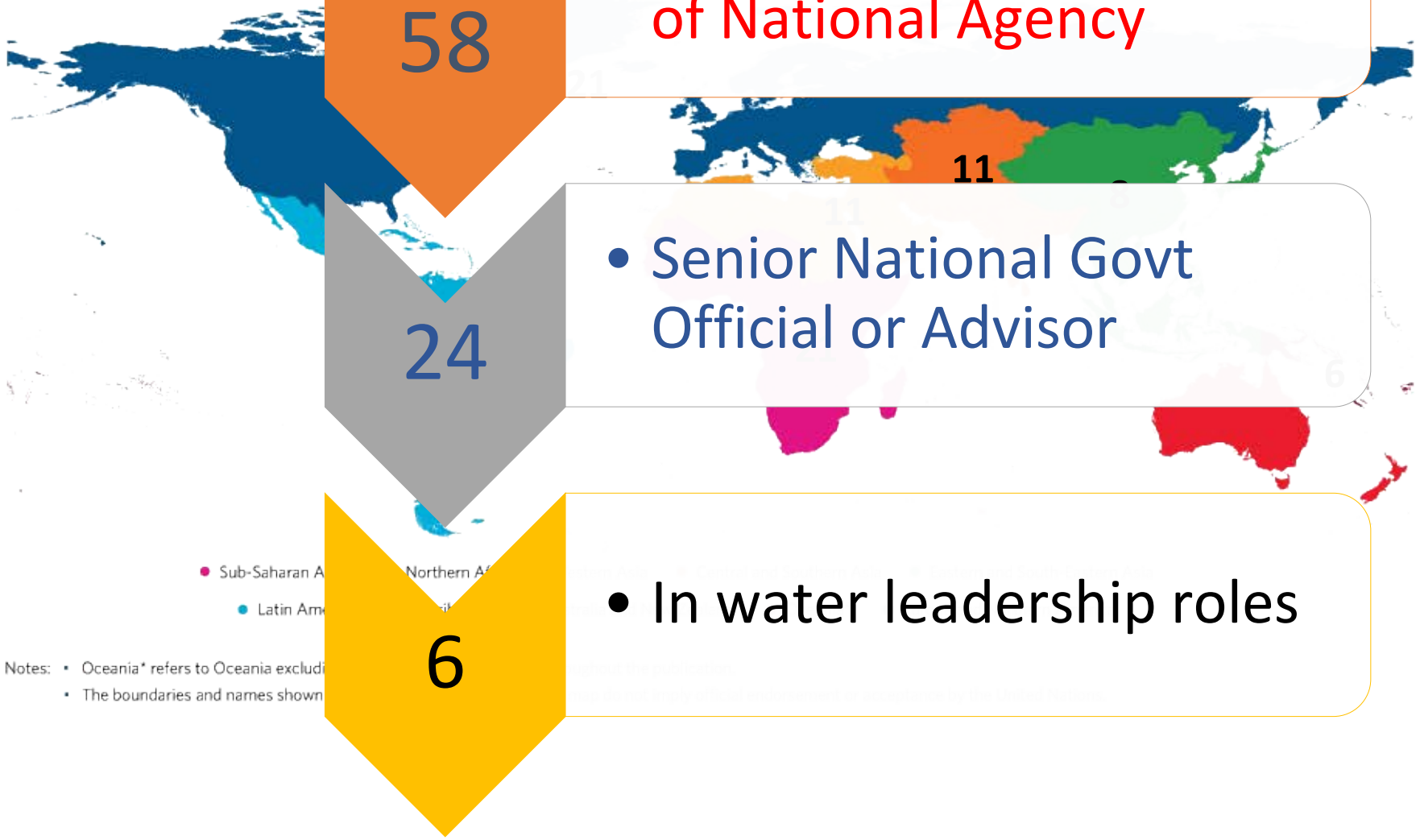
- National Minister or Head of National Agency

24

- Senior National Govt Official or Advisor

6

- In water leadership roles



The survey had 3 areas of enquiry

Water Risks and Challenges

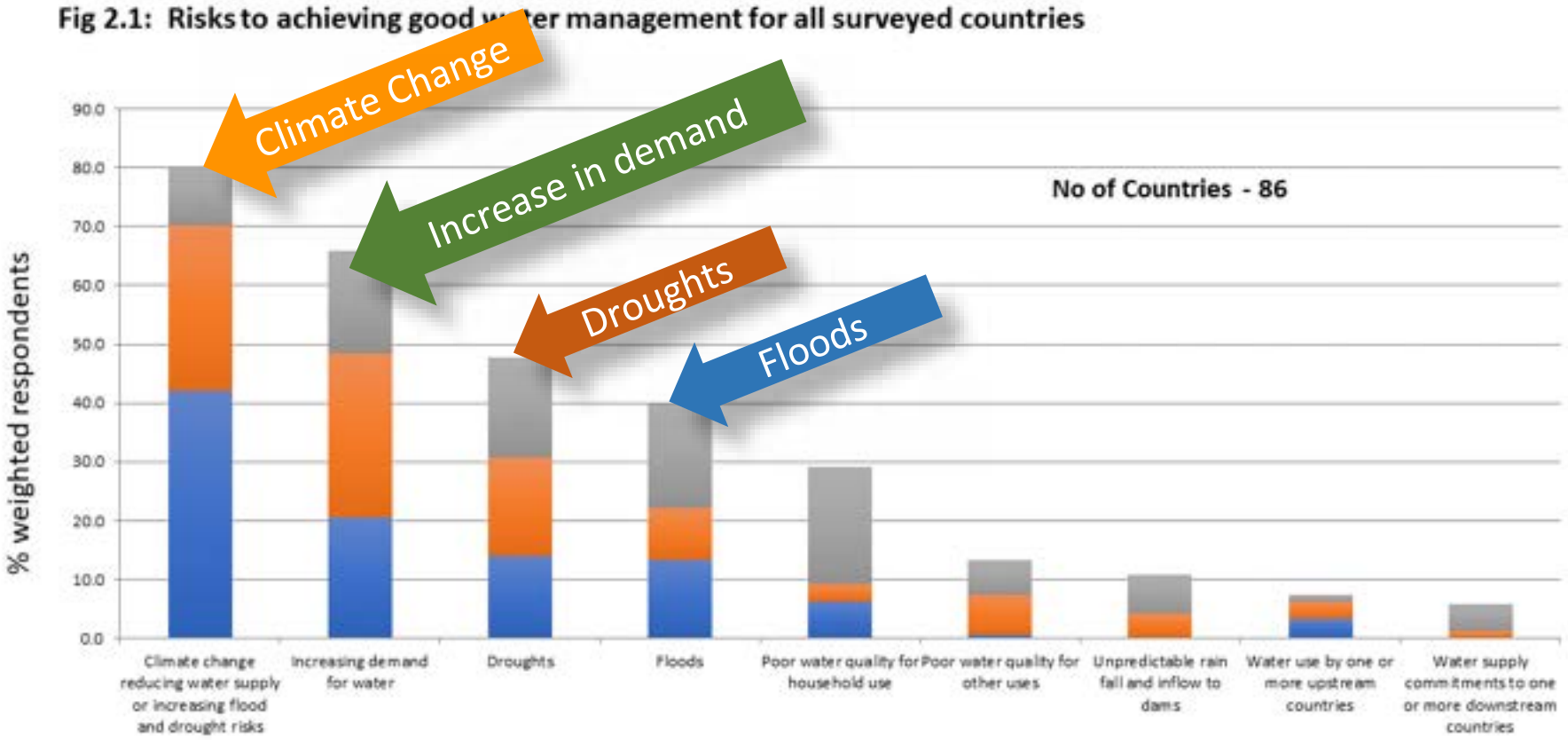
SDGs and the Global Acceleration Framework

Groundwater

WATER POLICY GROUP

Water Risks and Challenges

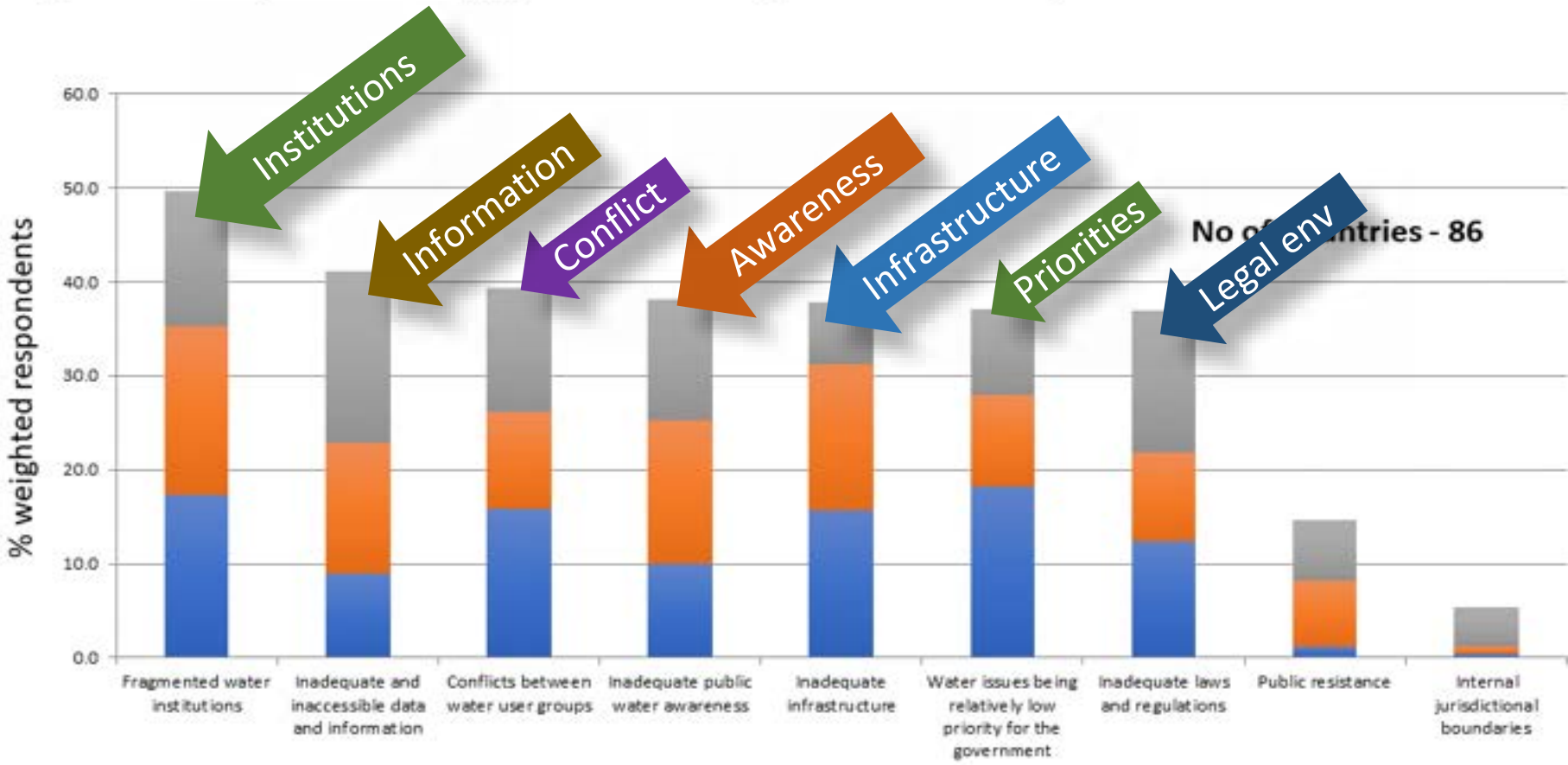
Risks to achieving good water management (Global)



Note – Blue indicates percentage of weighted responses ranked 1st
Orange indicates percentage of weighted responses ranked 2nd
Grey percentage of weighted responses ranked 3rd

The Challenges achieving good water management (Global)

Fig 2.2: Challenges to achieving good water management for all surveyed countries



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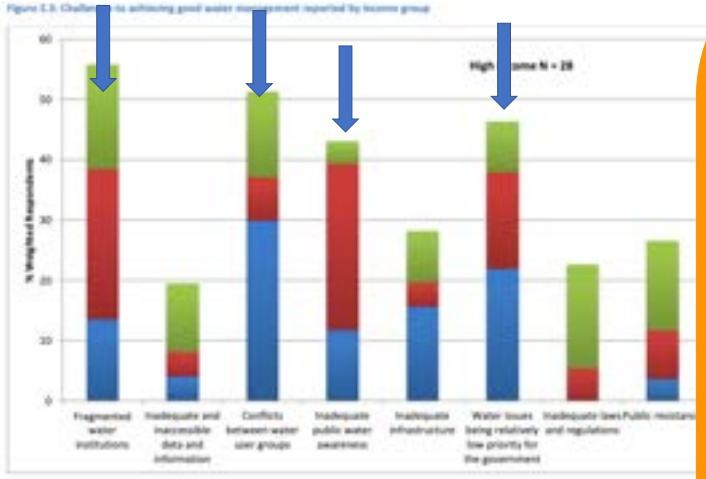
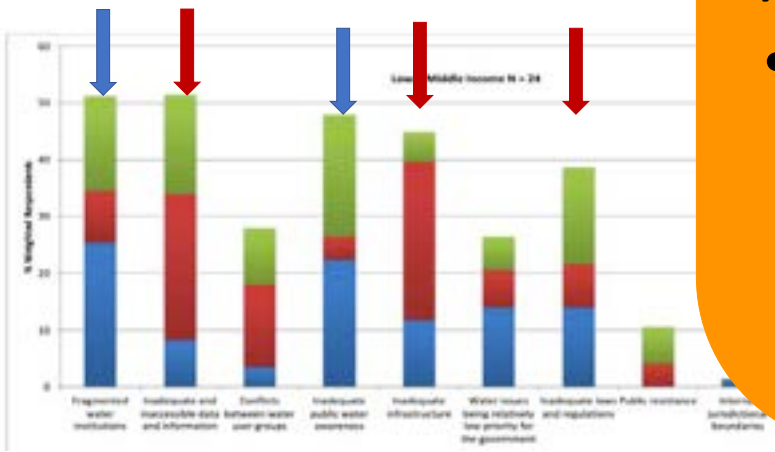
Challenges by Income Group





Higher Income countries

- Integration, prioritization and awareness

As income decreases

- Inadequate data, infrastructure and legal structures become more important

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SDGs and the Global Acceleration Framework

The SDG Challenges – Achieving targets

Table 3.1: Difficulty achieving SDG 6 water targets: overall and by country income group

SDG Target	SDG Target is 'Impossible or Challenging'				
	All Countries (n=88)	Responses for each Income Group			
		High (n=28)	Upper Middle (n=21)	Lower Middle (n=24)	Low (n=15)
Protecting/restoring water-dependent ecosystems	73%	56%	81%	80%	81%
Increasing water use efficiency	69%	42%	78%	80%	78%
Improved water quality	67%	44%	75%	73%	75%
Safe and affordable drinking water	58%	22%	75%	63%	75%
Implementing IWRM	58%	28%	67%	73%	67%
Impact of water scarcity	56%	23%	75%	63%	75%
Strengthening local participation	46%	28%	56%	50%	56%
Transboundary Cooperation	37%	21%	39%	34%	39%

Figures in red indicate increased proportions of countries finding the target 'impossible or challenging' compared to the all countries aggregate. Figures in light blue indicate decreased proportions of countries finding the target 'impossible or challenging' compared to the all countries aggregate.

The SDG Challenges – Global

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The SDG Challenges
Global Acceleration Framework (GAF)

United Nations-Water Global Acceleration framework 'accelerators':

1. **Financing**. Optimized financing is essential to get resources behind country plans.
2. **Data and information**. Data and information targets resources and measures progress.

3. **Capacity development.** A better-skilled workforce improves service levels and increases job creation and retention in the water sector.

4. **Innovation**. New, smart practices and technologies will improve water and sanitation resources management and service delivery.

5. **Governance**. Collaboration across boundaries and sectors will make SDG6 everyone's business.

www.unwater.org/sdg6-action-space

The SDG Challenges

Table 3.2: Relative Importance of reasons for SDG 6 target on drinking water being rated 'challenging' or 'impossible'

Income Group	Considered 'Impossible or Challenging' (by %age of surveyed countries)	Reasons for considering 'Safe and Affordable Drinking Water' to be Impossible or Challenging (Relative Importance)				
		Lack of Financing	Lack of Information	Lack	Lack of Innovation	Governance Problems
All Countries	58% (N=88)	**			–	**
High Income	22% (N=28)	**		•	–	**
Upper Middle	75% (N=21)	**	–	**		•
Lower Middle	63% (N=24)	***	•		–	**
Low	75% (N=15)	•	•	•	–	•

Note - the relative importance of the 5 key Reasons is assessed using the following
*** = ranked as a 'top two' reason by 75%+ of surveyed countries, ** = ranked as a 'top two' reason by 50-74% of surveyed countries
• = ranked as a 'top two' reason by 25-49% of surveyed countries, – = ranked as a "top two reason" by 0-24% of surveyed countries
Scores on the boundary between groups have been rounded up

Finance

Governance

In a nutshell, to national water leaders around the globe

- Highest risk is ***climate change*** and related pressures on water system.
- Greatest Challenge is ***Integration and Prioritization.***
- *SDG 6 targets are challenging or impossible to achieve*
- Covid-19 has ***limited influence*** on priorities.
- ***ODA divide*** in perceptions of donors and recipients continue.
- Groundwater is essential, but ***not used sustainably***.

Food and Agriculture Organization of the United Nations

The state of the world's land and water resources for food and agriculture (SOLAW)

Systems at breaking point

SOLAW 2011 and 2021

The Context

Between **720** and **811** Million people worldwide faced hunger in 2020

We need to produce **50%** more food, feed and biofuel than we did in 2012

Around **3.2** billion people are impacted by water scarcity

The Status of agricultural land

Land-use class change, 2000–2019 (million ha)

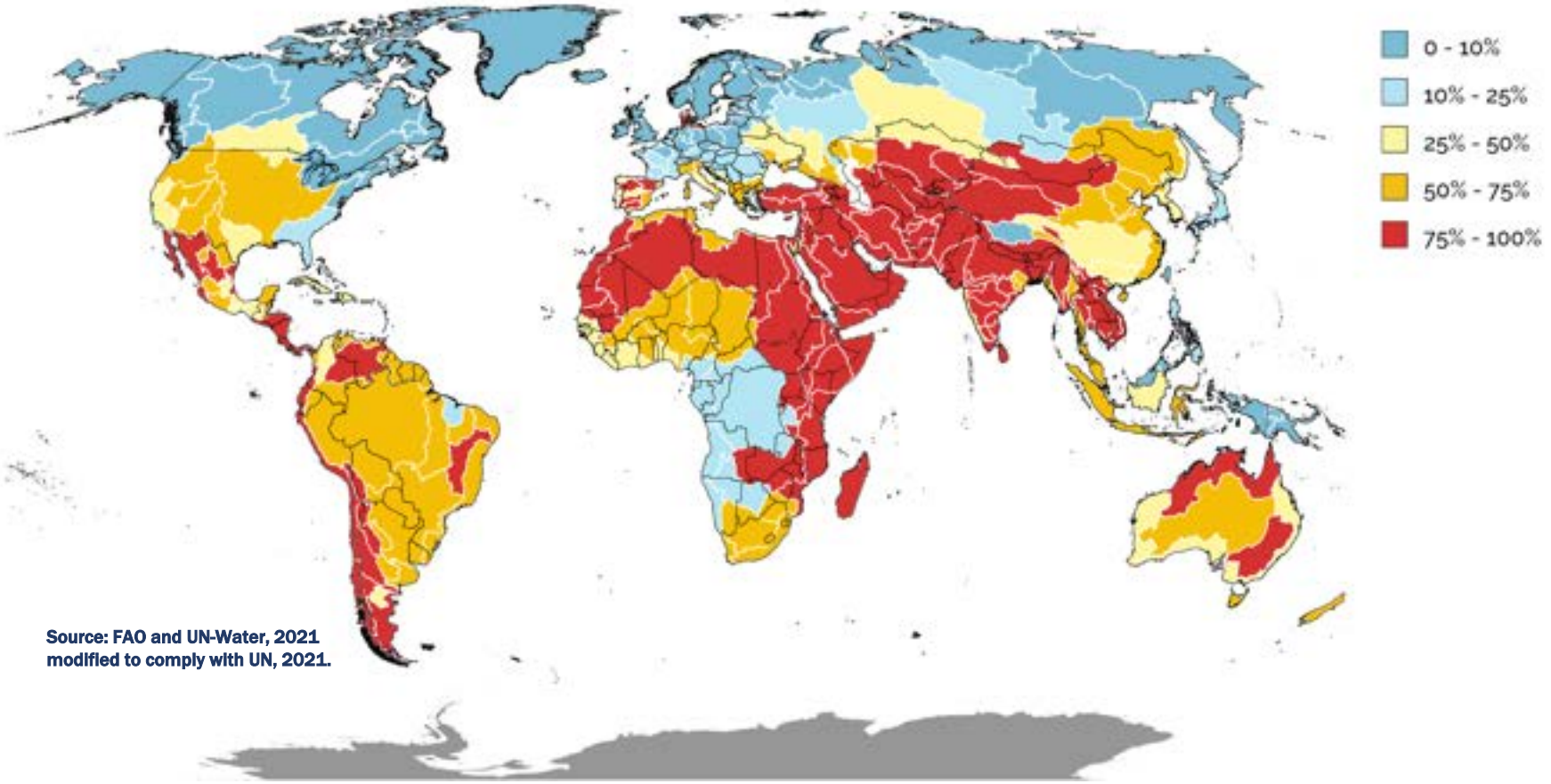
Land-use class	2000	2019	Change
Land under permanent meadows and pastures (a)	3 387	3 196	−191
Cropland (arable land and permanent crops) (b = b1 + b2)	1 493	1 556	+63
- Arable land (land under temporary crops) (b1)	1 359	1 383	+24
- Land under permanent crops (b2)	134	170	+36
Agricultural land (total of cropland and permanent meadows and pasture) (C = a + b)	4 880	4 752	−128
- Land area equipped for irrigation	289	342	+53
Forest land (land area > 0.5 ha with trees > 5 m + 10% canopy cover)	4 158	4 064	−94
Other land	3 968	4 188	+220

Source: FAO. 2020a. FAOSTAT. http://www.fao.org/faostat/en/#data/QC

Agricultural land available per capita declined by more than 22%.

The State: The interconnected systems of land, soil and water are stretched to the limit

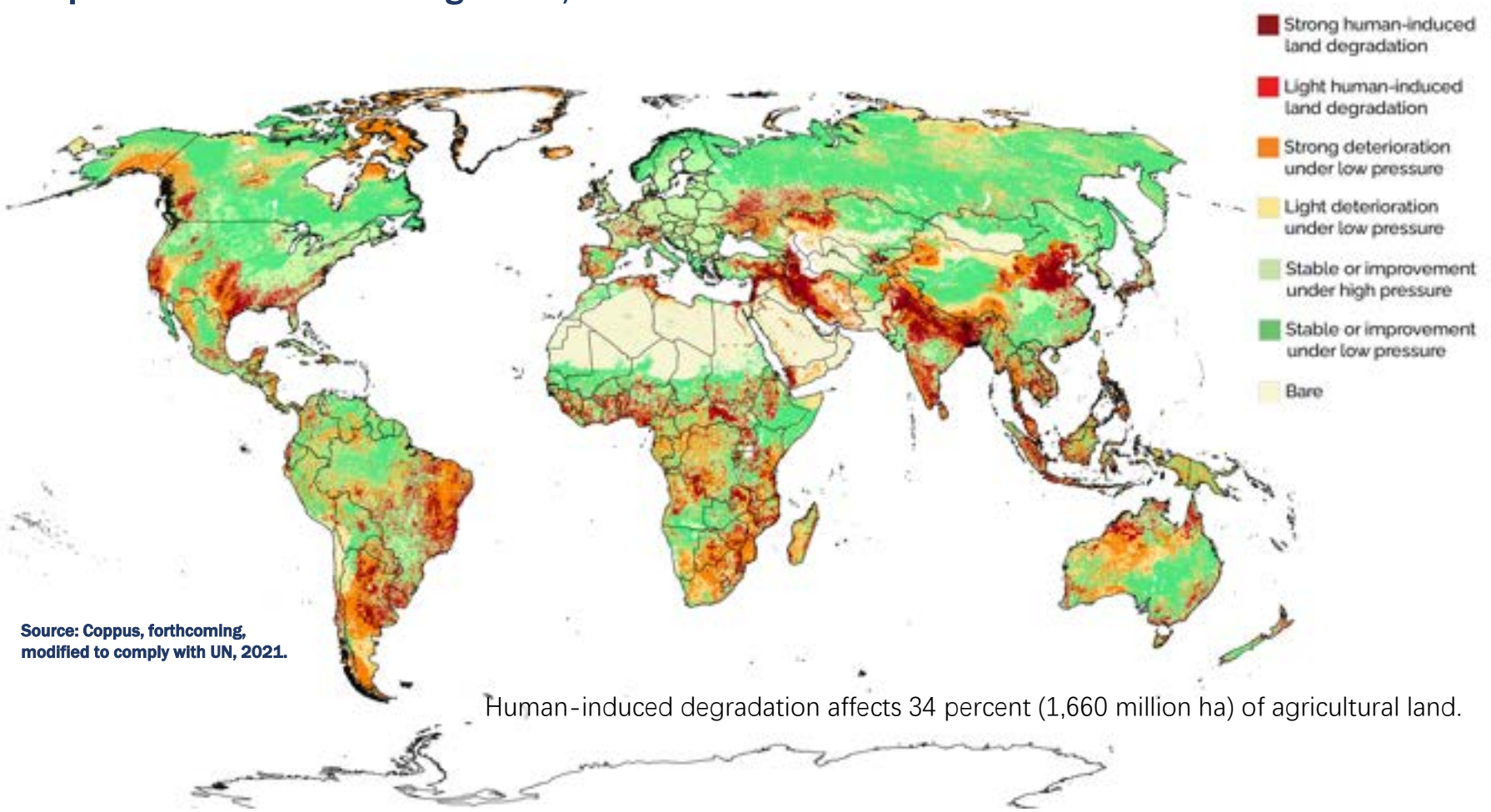
Level of water stress due to the agricultural sector by basin, 2018



Source: FAO and UN-Water, 2021
modified to comply with UN, 2021.

The State: Current patterns of agricultural intensification are not proving sustainable

Land-degradation classes based on severity of human-induced pressures and deteriorating trends, 2015

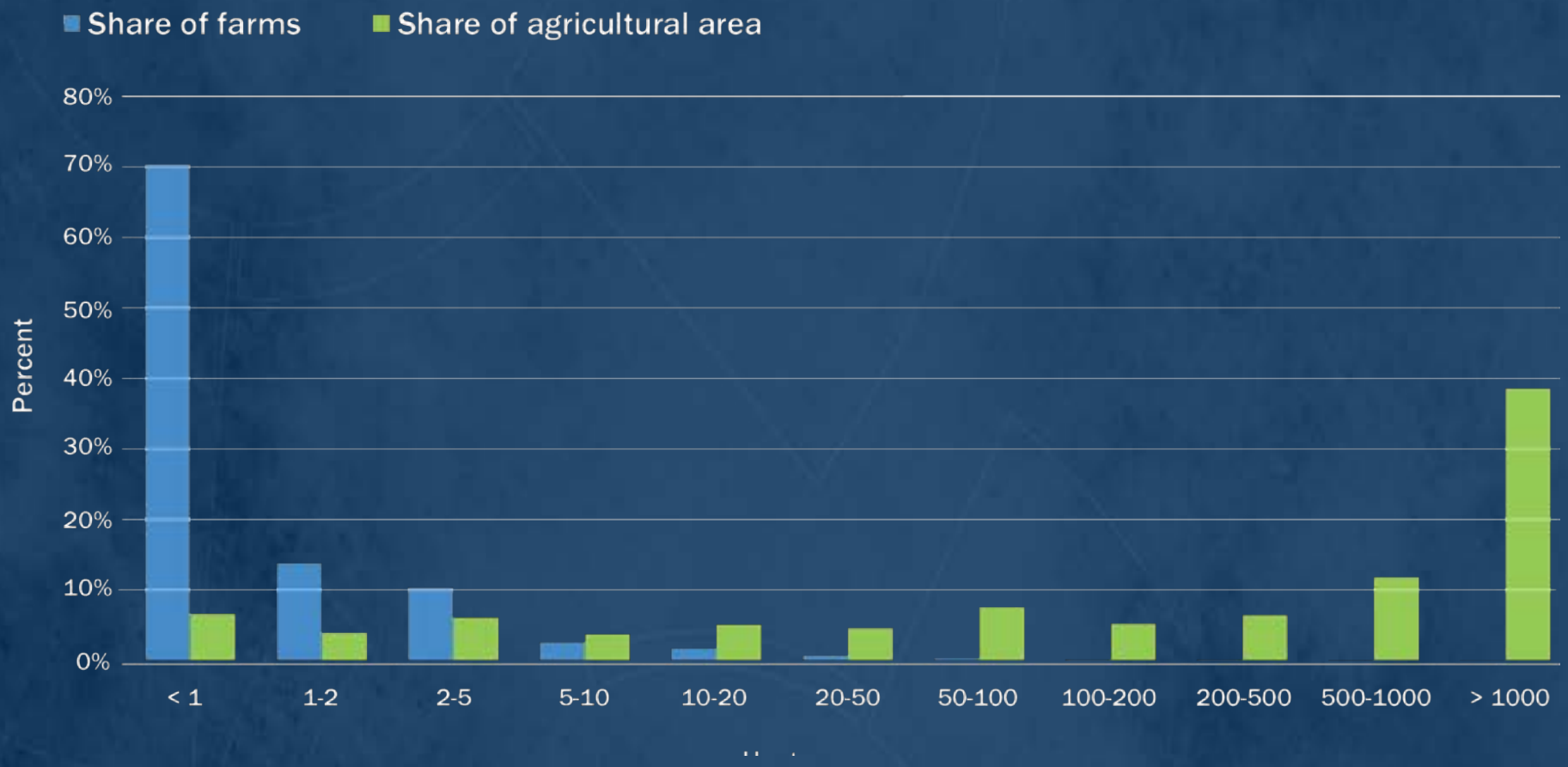


Source: Coppus, forthcoming, modified to comply with UN, 2021.

Human-induced degradation affects 34 percent (1,660 million ha) of agricultural land.

The State: Farming systems are becoming polarized

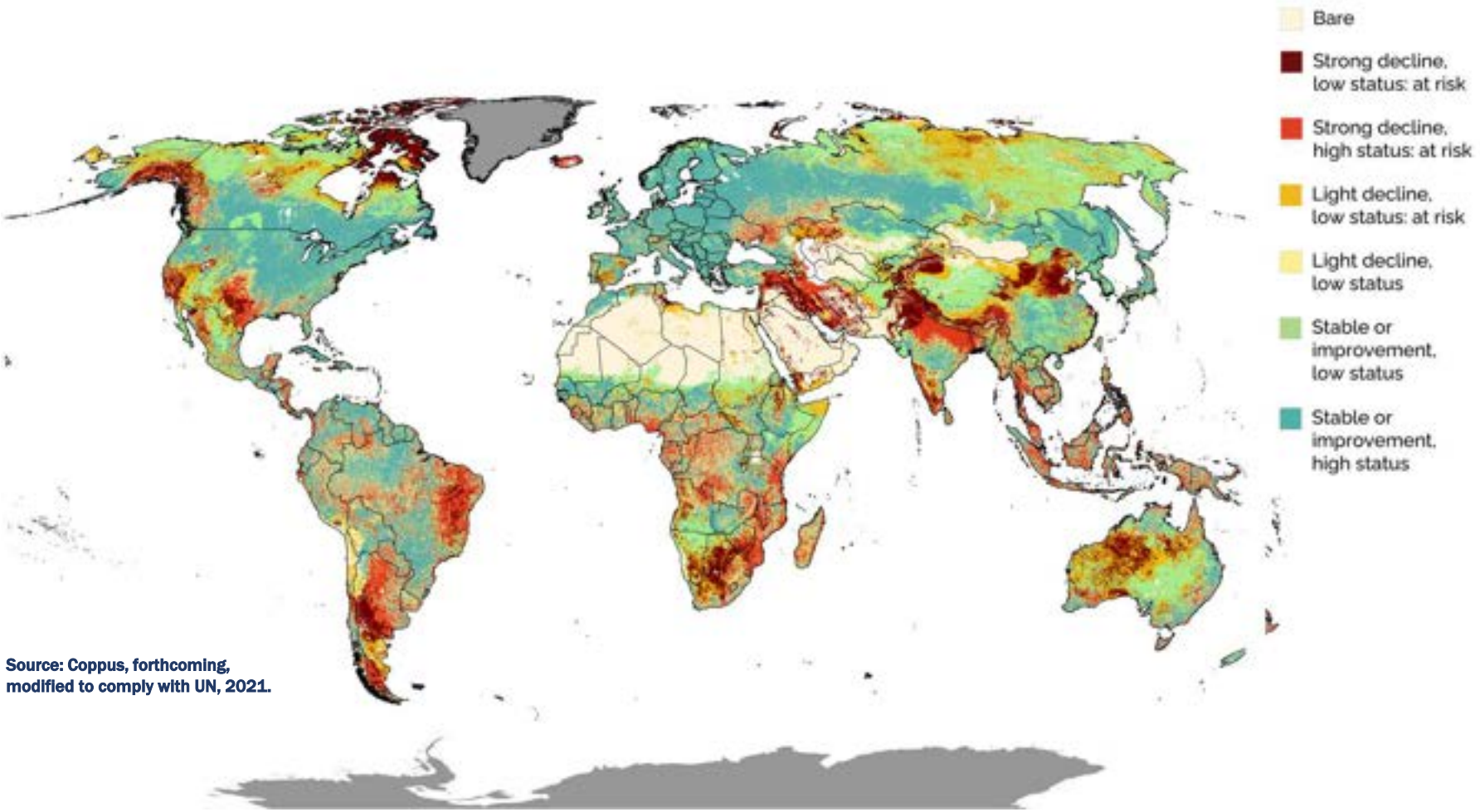
Global distribution of farms and farmland by land size class, 2010



Source: Lowder, Sánchez and Bertini, 2021.

Challenge 1: Future agricultural production will depend upon managing the risks to land and water

Regions at risk based on status and trends of land resources, 2015



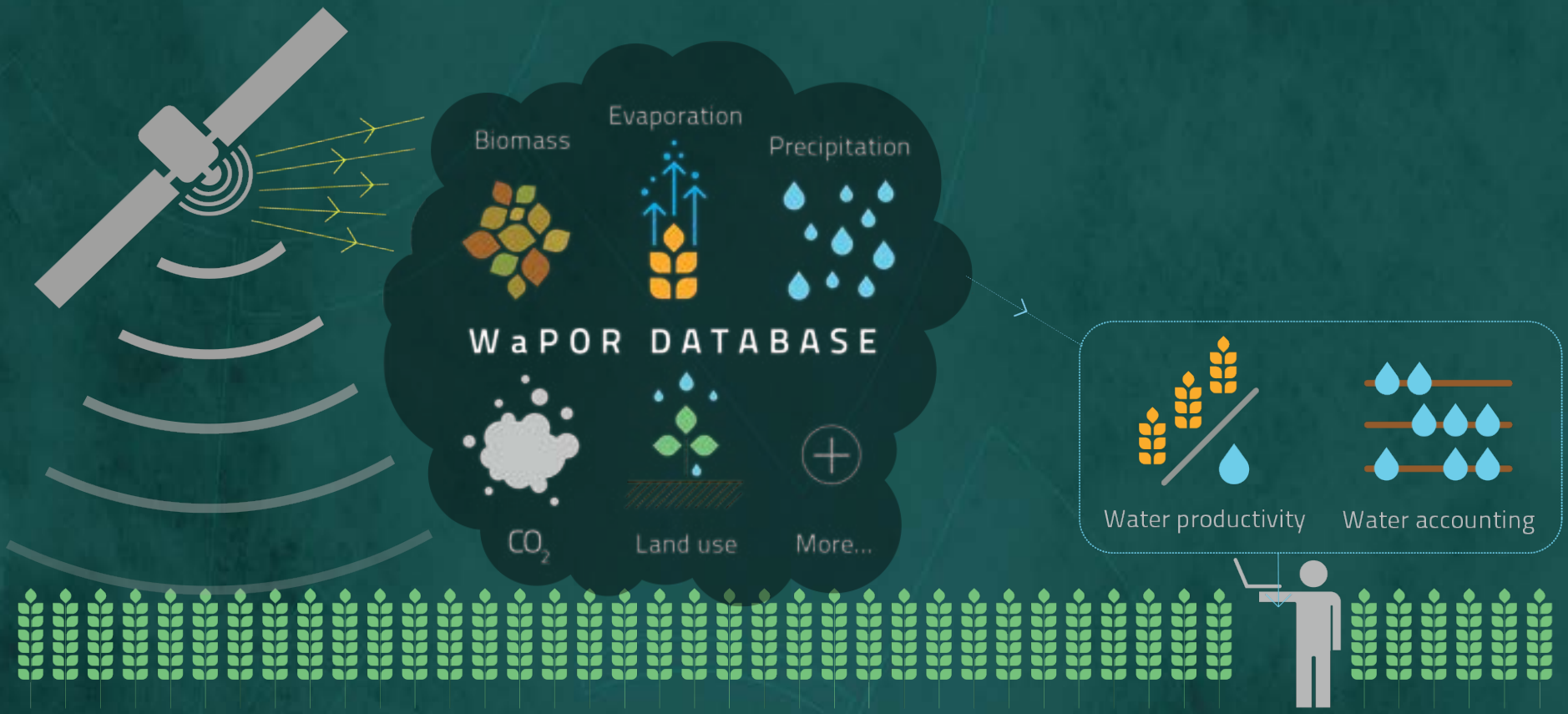
Source: Coppus, forthcoming, modified to comply with UN, 2021.

Challenge 2: Land and water resources will need safeguarding

Response 1: Land and water governance has to be more inclusive, adaptive and effective.

Response 2: integrated solutions need to be planned and implemented at all levels

Response 3: Technical and managerial innovation can be targeted to address priorities and accelerate transformation



Response 4: agricultural support and investment can be redirected towards social and environmental gains derived from land and water management.

OECD-FAO Agricultural Outlook 2022-2031

OECD

Food and Agriculture Organization of the United Nations

INTERNATIONAL MONETARY FUND

WORLD ECONOMIC OUTLOOK

War Sets Back the Global Recovery

2022
APR

Revised growth estimates

- After a rebound of 5.4% in 2021 following the 2020 recession due to the COVID-19 pandemic, global GDP growth is expected to slowdown in 2022 and 2023 and to stabilise at an average rate of 2.7% over the next decade.
- Asia Pacific, North America, and Sub-Saharan Africa had already recovered to their pre-COVID-19 levels in 2021.
- In Latin America and the Caribbean, Europe and Central Asia, and Near East and North Africa, GDP is projected to return to the 2019 value in 2022.
- Over the period 2022-31, GDP will continue to grow strongly in the Asia Pacific region, in particular in India, China and Southeast Asia, at an average of about 4% p.a.
- Sub-Saharan Africa, and Near East and North Africa, average GDP growth of 4% p.a. and 3% p.a., respectively, is projected over the next ten years.
- Lower average GDP growth is expected overall in OECD economies, at 1.8% p.a.

Food consumption and production

- Global food consumption is projected to increase by 1.4% p.a. over the next decade, mainly driven by population growth, originating in low- and middle-income countries.
- Over the next decade, global agricultural production is projected to increase by 1.1% p.a., with the additional output to be predominantly produced in middle- and low-income countries.
- The Outlook assumes wider access to inputs as well as increased productivity-enhancing investments in technology, infrastructure, and training as critical drivers of agricultural development.
- A prolonged increase in energy and agricultural input prices (e.g. fertilisers) will raise production costs and may constrain productivity and output growth in the coming years.

Agriculture and climate change

- Direct GHG emissions from agriculture are projected to increase by 6% , with livestock accounting for 90% of this increase.
- Yet, agricultural emissions will grow at a lower rate than production, thanks to yield improvements and a reduction in the share of ruminant production, indicating a decline in the carbon intensity of agriculture.
- Significant efforts are needed for agriculture to further reduce emissions.
- This includes large-scale adoption of climate-smart production processes and technologies, especially in the livestock sector.

To achieve SDG and Paris climate targets simultaneously

- substantial acceleration in productivity growth
- average global agricultural productivity would need to increase by 28% over the next decade.
- For crops, the necessary 24% increase in average global yields – which acts as a proxy for crop productivity – is close to double the increase achieved over the past decade (13%).
- Global animal productivity would have to increase by 31%, on average, vastly exceeding the growth recorded during the last decade.

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UN 2023 WATER CONFERENCE

NEW YORK 22–24 MARCH 2023

Regional preparatory meetings for UN 2023 Water Conference

On 20 December 2018, the General Assembly adopted the resolution on the "Midterm comprehensive review of the implementation of the International Decade for Action, 'Water for Sustainable Development', 2018-2028" (A/RES/73/226).... Read more

Regional preparatory meetings for UN 2023 Water Conference

06 April, 2022

FAO's Building Forward Better Initiative – new website

04 April, 2022

New website for WASAG – the Global Framework on Water Scarcity in Agriculture

31 March, 2022

Online course on gender and integrated water resources management

28 March, 2022

United Nations | UN WATER

UN Photo

March 14, 1977

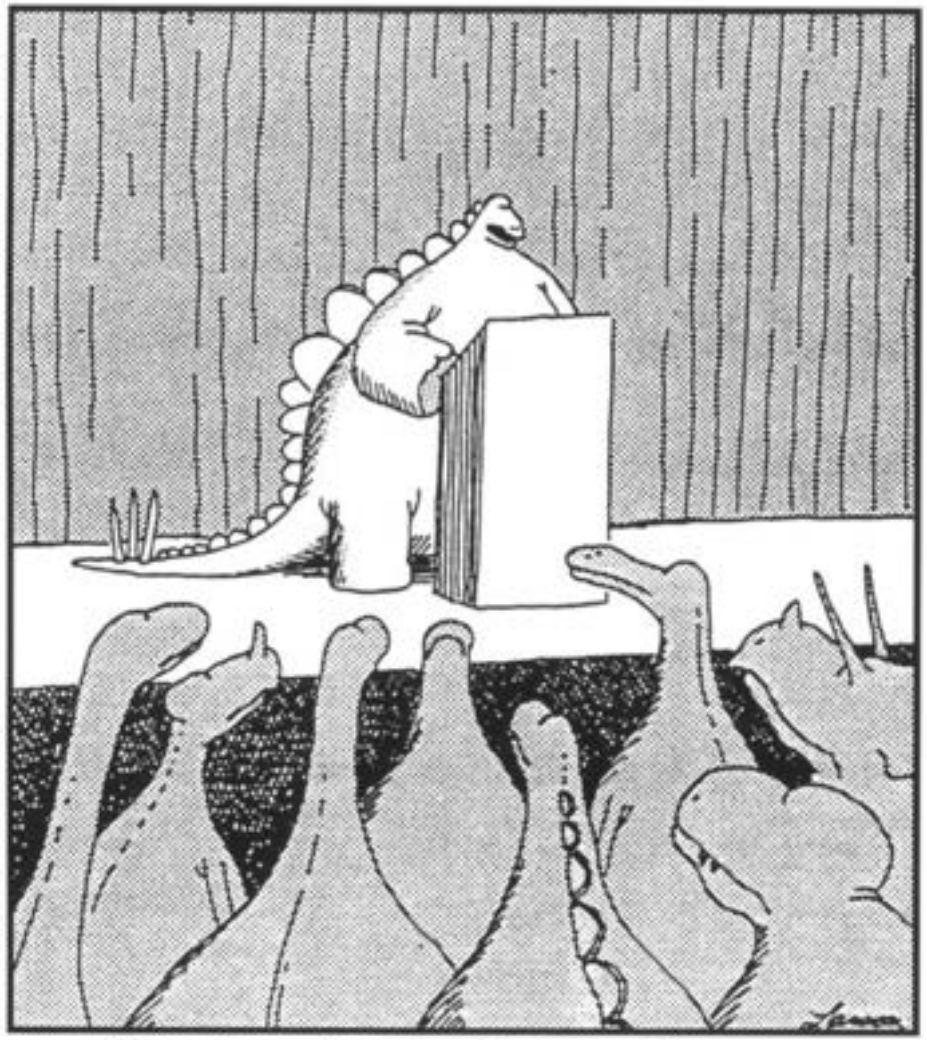
United Nations Water Conference Opens in Mar Del Plata

COPs

COP27
SHARM EL-SHEIKH
EGYPT 2022

COPs: Conference of the dinosaurs?

COP27
SHARM EL-SHEIKH
EGYPT 2022



"The picture's pretty bleak, gentlemen. ... The world's climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut."

ASU
Arizona State University

UK Irrigation Association

An independent organisation promoting
the wise use of water for irrigation

Thank you!

UKIA Summer conference

Building resilience and sustainability in irrigated agriculture in UK

Is water for food still the 'missing link' in water resources planning?

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