



معاً ننمو، ونتغذى، ونحافظ على الاستدامة.

齐成长、同繁荣、共持续。

Grow, Nourish, Sustain. Together.

Cultiver, nourrir, préserver. Ensemble.

Взрастим, накормим, поддержим. Вместе.

Cultivar, nutrir, preservar. Juntos.

# Agriculture, food security and the long-term global goal

**Martial Bernoux**

Office of Climate Change, Biodiversity and Environment

First meeting of the Structured Expert Dialogue of the second periodic review (second session)

3<sup>rd</sup> June 2021



Food and Agriculture  
Organization of the  
United Nations

The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to **defeat hunger**.

Our goal is to **achieve food security for all** and make sure that people have regular access to enough high-quality food to lead active, healthy lives.



With over 194 member states,  
FAO works in over 130 countries worldwide.



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## FAO core functions

- Assemble, analyse, monitor and improve **access to data and information**
- *Facilitate and support countries and other partners in the development and implementation of **normative and standard setting instruments***
- *Facilitate, promote and support **agri-food systems policy dialogue** at global, regional and country levels*
- *Support institutions at all levels, including through **capacity development**, to prepare, implement, monitor and evaluate evidence-based policies and programmes, and leverage investments*
- Facilitate **partnerships and coalitions**
- *Advise and support activities that assemble, disseminate and improve the uptake of **knowledge, technologies and good practices***
- **Advocate and communicate** at national, regional and global levels

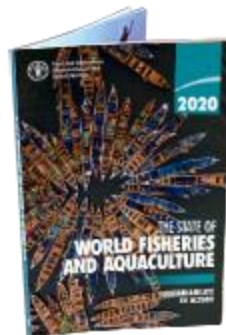


Food and Agriculture  
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## FAO FLAGSHIP PUBLICATIONS



**The State of  
Food Security  
and Nutrition  
in the World  
(SOFI)**



**The State of  
World Fisheries  
and Aquaculture  
(SOFIA)**



**The State of  
the World's  
Forests  
(SOFO)**



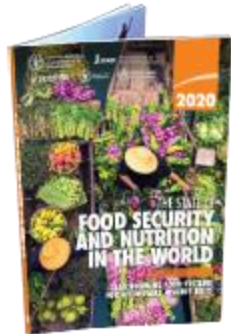
**The State of  
Agricultural  
Commodity  
Markets  
(SOCO)**



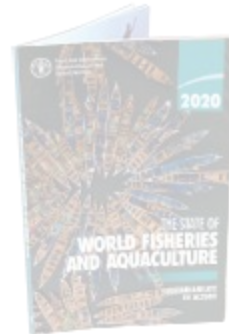
**The State of  
Food and  
Agriculture  
(SOFA)**



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**The State of Food Security and Nutrition in the World (SOFI)**



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**The State of Food and Agriculture (SOFA)**



**In 2019, close to 750 million – or nearly one in ten people in the world – were exposed to severe levels of food insecurity**

**The world is not on track to achieve Zero Hunger by 2030. If recent trends continue, the number of people affected by hunger would surpass 840 million by 2030**

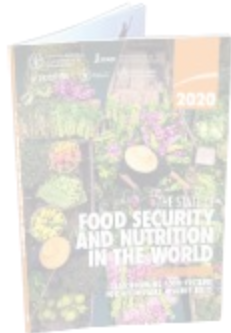
**A preliminary assessment suggests that the COVID-19 pandemic may add up to 132 million people to the total number of undernourished in the world in 2020.**





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United Nations

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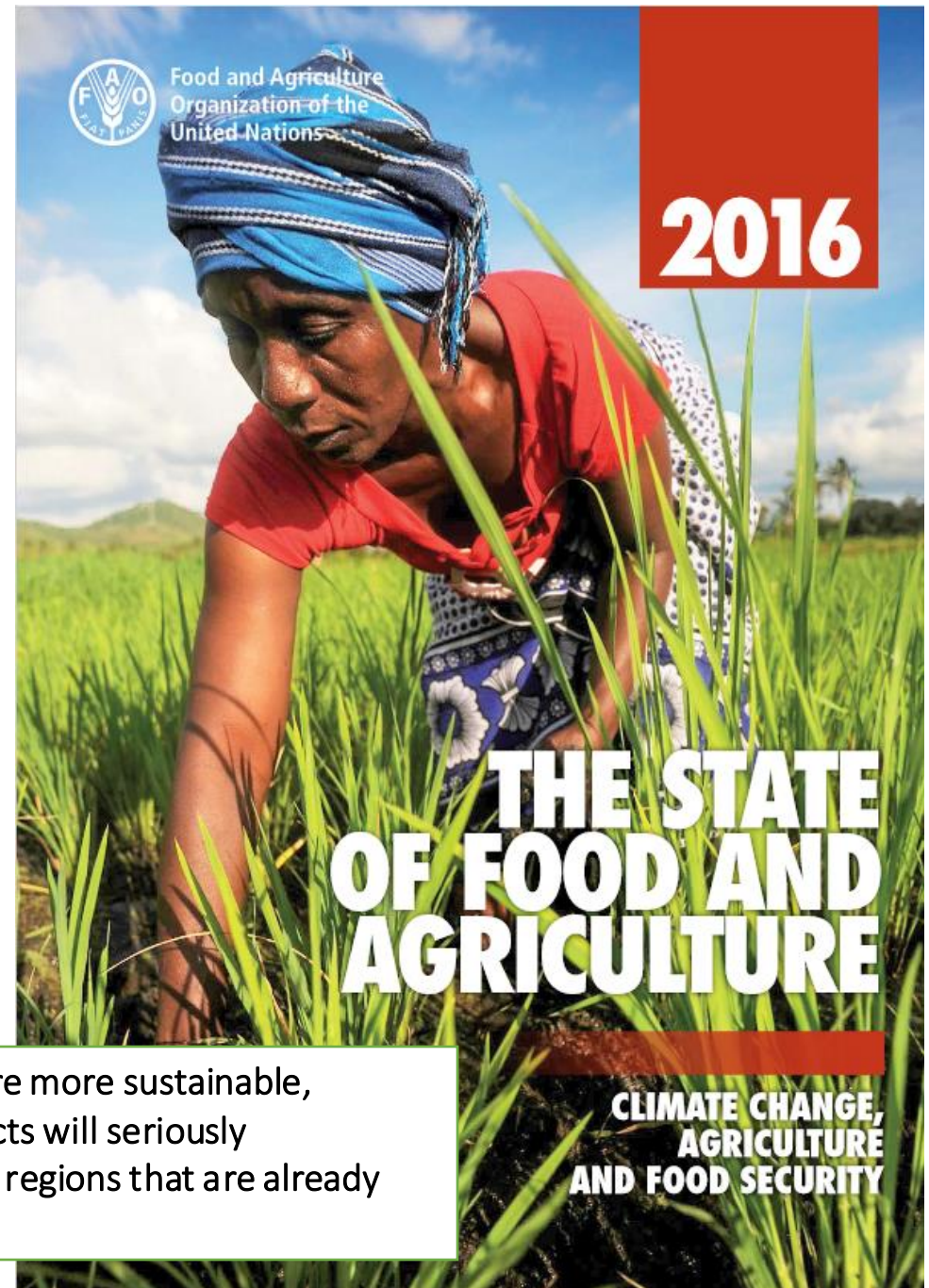


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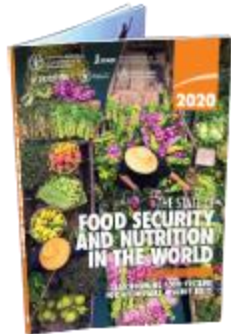
The State of  
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“Unless action is taken now to make agriculture more sustainable, productive and resilient, climate change impacts will seriously compromise food production in countries and regions that are already highly food-insecure” SOFA, 2016

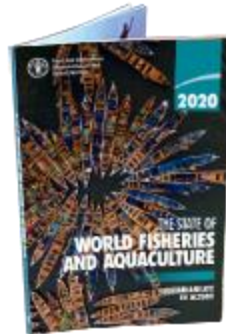




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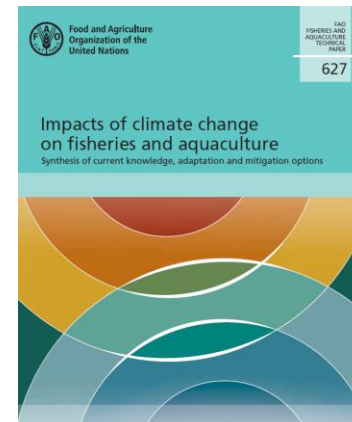
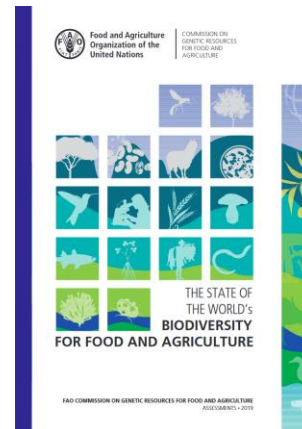


**The State of Agricultural Commodity Markets (SOCO)**



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## Data and information relevant to all areas of FAO works





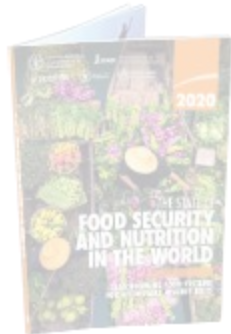


## Annual rate of forest expansion and deforestation, 1990–2020

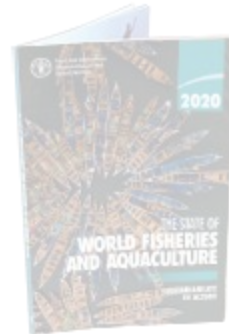




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### FAOSTAT Statistics Division

### Food and agriculture data

FAOSTAT provides free access to food and agriculture data for over 245 countries and territories and covers all FAO regional groupings from 1961 to the most recent year available.

[Explore Data](#)



**Production**

- Crops
- Crops Processed
- Live Animals
- Livestock Primary
- Livestock Processed
- Production Indices
- Value of Agricultural Production

**Trade**

- Crops and livestock products
- Live animals
- Detailed trade matrix
- Trade indices

**Supply Utilization Accounts**

- Crops
- Crops Processed *new*
- Livestock Primary *new*
- Livestock Processed *new*

**Food Balance**

- New Food Balances *revision*
- Food Balances (old methodology and population)
- Commodity Balances - Crops Primary Equivalent
- Commodity Balances - Livestock and Fish Primary Equivalent
- Food Supply - Crops Primary Equivalent
- Food Supply - Livestock and Fish Primary Equivalent

**Food Security**

- Indicators from Household Surveys (gender, area, socioeconomic)
- Suite of Food Security Indicators

**Prices**

- Producer Prices
- Producer Prices (old series)
- Consumer Price Indices
- Deflators *update*
- Exchange rates - Annual

**Inputs**

- Fertilizers by Nutrient
- Fertilizers by Product
- Fertilizers archive
- Pesticides Use
- Pesticides Trade
- Land Use
- Employment Indicators *update*
- Soil nutrient budget *update*

**Population**

- Annual population

**Investment**

- Machinery
- Machinery Archive
- Government Expenditure
- Credit to Agriculture
- Development Flows to Agriculture
- Foreign Direct Investment (FDI)
- Country Investment Statistics Profile

**Macro-Statistics**

- Capital Stock
- Macro Indicators *update*

**Agri-Environmental Indicators**

- Fertilizers indicators
- Land use indicators
- Land Cover
- Livestock Patterns
- Livestock Manure
- Pesticides indicators
- Emissions shares
- Emissions intensities
- Temperature change *update*

**Emissions - Agriculture**

- Agriculture Total
- Enteric Fermentation
- Manure Management
- Rice Cultivation
- Synthetic Fertilizers
- Manure applied to Soils
- Manure left on Pasture
- Crop Residues
- Cultivation of Organic Soils
- Burning - Savanna
- Burning - Crop Residues
- Energy Use *revision*

**Emissions - Land Use**

- Land Use Total
- Forest Land
- Cropland
- Grassland
- Burning - Biomass

**Forestry**

- Forestry Production and Trade
- Forestry Trade Flows

**ASTI R&D Indicators**

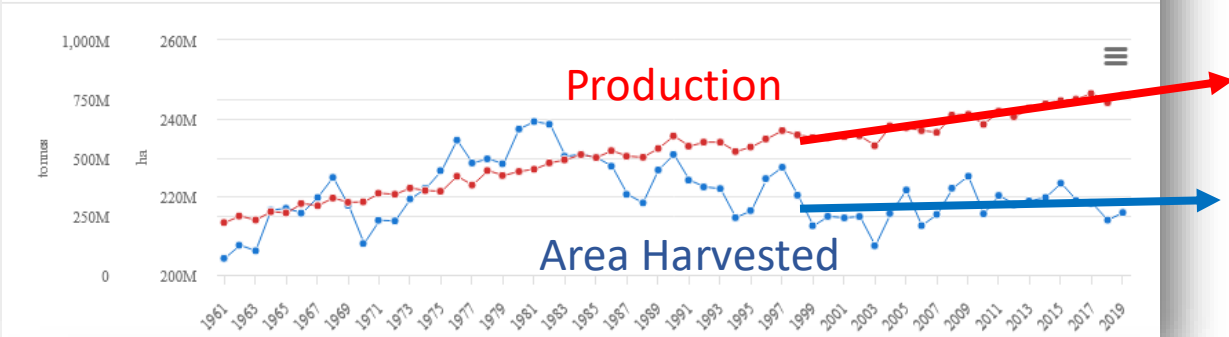
- ASTI-Researchers
- ASTI-Expenditures

**Emergency Response**

- Food Aid Shipments (WFP)

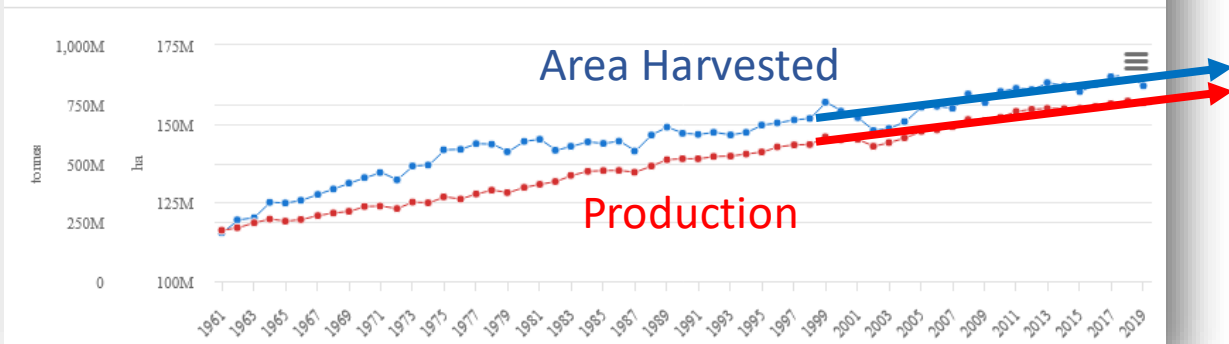
Production/Yield quantities of Wheat in World + (Total)

1961 - 2019



Production/Yield quantities of Rice, paddy in World + (Total)

1961 - 2019



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Explore Data

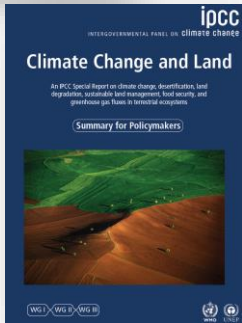




## Key Messages

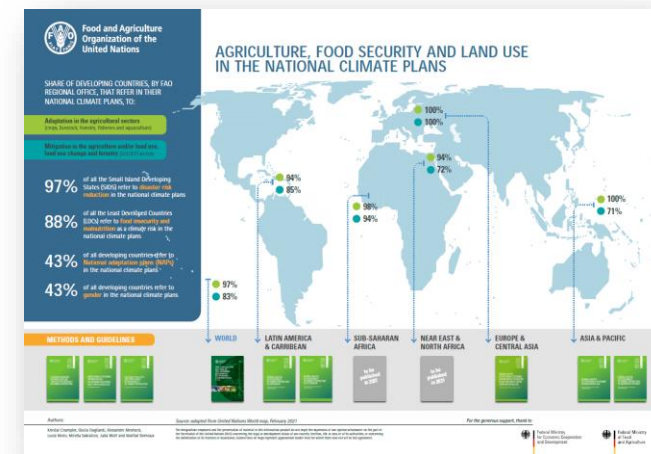
1. Climate Change will incrementally affect all of the agriculture sectors
2. If left unaddressed, climate change will exacerbate poverty and inequalities
3. Climate change impacts goes well beyond crop yields
4. Agriculture sectors can only reduce GHG emissions through more investment
5. Efforts in agricultural sectors are not enough, drastic economy-wide GHG reduction are needed

FAO data and information regularly support and contribute the IPCC publications, including the Assessment Reports and the Special Reports.



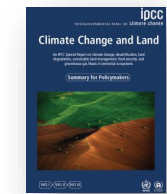
- **Human use directly affects more than 70% of the global, ice-free land surface**, and Agriculture, Forestry and Other Land Use (AFOLU) activities accounted for around 13% of CO<sub>2</sub>, 44% of methane (CH<sub>4</sub>), and 81% of nitrous oxide (N<sub>2</sub>O) emissions from human activities globally during 2007-2016.
- Decarbonization pathways to Achieve Net-Zero by 2050 are **not possible without the “land” sector**: both reduction of emissions (CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O) **and** CO<sub>2</sub> sinks.
- **Land/AFOLU is different from the other sectors**: Food Security and Nutrition, multiple ecosystems services, complex in many aspects (source + sink, natural + anthropogenic, etc), **adaptation-mitigation cannot be dissociated** (context specific), concerning billions of people including the most vulnerable, etc.

- Commitments from States and non-State stakeholders already consider the “land” sector (e.g. mentioned in **more than 90% of national climate plans** such as NDCs, NAPS, etc)
- **Numerous options exist and can be applied** (short/mid-term impacts), including several “no-regrets” options.





# Mitigation effects of response options based on land management ...



## ...in agriculture

## ...in forests

## ...of soils

Integrated response option	Potential	Confidence
Increased food productivity	>13 GtCO <sub>2</sub> e yr <sup>-1</sup>	Low confidence
Improved cropland management <sup>a</sup>	1.4–2.3 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence
Improved grazing land management <sup>a</sup>	1.4–1.8 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence
Improved livestock management <sup>a</sup>	0.2–2.4 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence
Agroforestry	0.1–5.7 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence
Agricultural diversification	>0	Low confidence
Reduced grassland conversion to cropland	0.03–0.7 GtCO <sub>2</sub> e yr <sup>-1</sup>	Low confidence
Integrated water management	0.1–0.72 GtCO <sub>2</sub> e yr <sup>-1</sup>	Low confidence

Integrated response option	Potential	Confidence
Forest management	0.4–2.1 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence
Reduced deforestation and forest degradation	0.4–5.8 GtCO <sub>2</sub> e yr <sup>-1</sup>	High confidence
Reforestation and forest restoration	1.5–10.1 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence
Afforestation	0.5–8.9 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence

Integrated response option	Potential	Confidence
Increased soil organic carbon content	0.4–8.6 GtCO <sub>2</sub> e yr <sup>-1</sup>	High confidence
Reduced soil erosion	Source of 1.36–3.67 to sink of 0.44–3.67 GtCO <sub>2</sub> e yr <sup>-1</sup>	Low confidence
Reduced soil salinisation	>0	Low confidence
Reduced soil compaction	>0	Low confidence
Biochar addition to soil	0.03–6.6 GtCO <sub>2</sub> e yr <sup>-1</sup>	Medium confidence

3 to > 27 GtCO<sub>2</sub>e yr<sup>-1</sup>

3 to 27 GtCO<sub>2</sub>e yr<sup>-1</sup>

-1,4 to > 20 GtCO<sub>2</sub>e yr<sup>-1</sup>

# Adaptation effects of response options based on land management ...

## ...in agriculture

## ...in forests

## ...of soils

Integrated response option	Potential	Confidence
Increased food productivity	>163 million people	Medium confidence
Improved cropland management	>25 million people	Low confidence
Improved grazing land management	1–25 million people	Low confidence
Improved livestock management	1–25 million people	Low confidence
Agroforestry	2300 million people	Medium confidence
Agricultural diversification	>25 million people	Low confidence
Reduced grassland conversion to cropland	No global estimates	No evidence
Integrated water management	250 million people	Low confidence

Integrated response option	Potential	Confidence
Forest management	>25 million people	Low confidence
Reduced deforestation and forest degradation	1–25 million people	Low confidence
Reforestation and forest restoration	See afforestation	
Afforestation	>25 million people	Medium confidence

Integrated response option	Potential
Increased soil organic carbon content	Up to 3200 million people
Reduced soil erosion	Up to 3200 million people
Reduced soil salinisation	1–25 million people
Reduced soil compaction	<1 million people
Biochar addition to soil	Up to 3200 million people; but potential negative (unquantified) impacts from land required from feedstocks

Up to several billion people

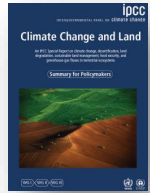
Up to hundred million people

Up to several billion people





## FAO data and information



## Action in the near-term

“Actions can be taken in the near-term, based on existing knowledge, to address desertification, land degradation and food security while supporting longer-term responses that enable adaptation and mitigation to climate change”

“Near-term action to address climate change adaptation and mitigation, desertification, land degradation and **food security can bring social, ecological, economic and development co-benefits**.”

“Co-benefits can contribute to poverty eradication and **more resilient livelihoods** for those who are vulnerable”.

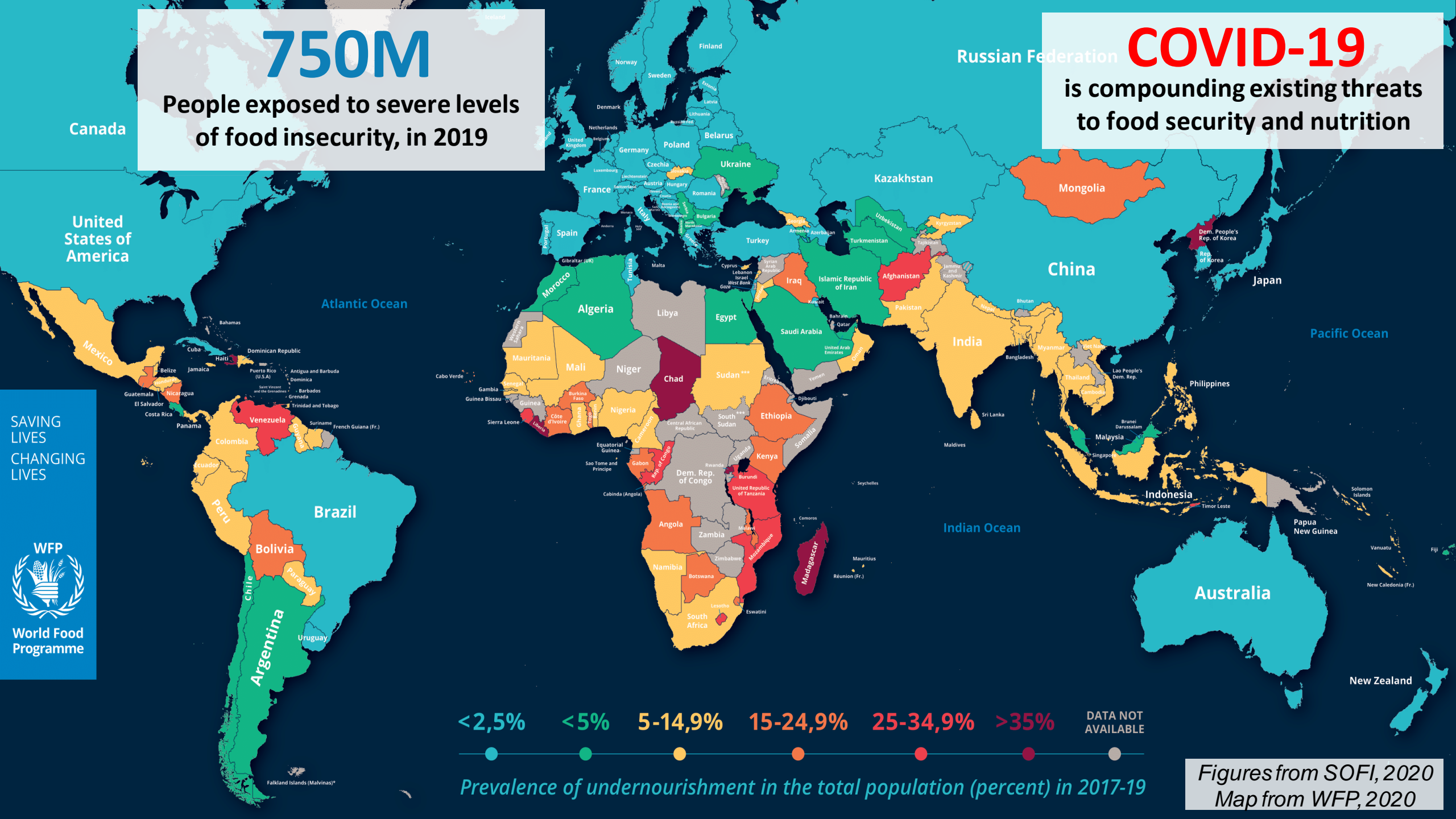
“Delaying climate mitigation and adaptation responses across sectors would lead to increasingly negative impacts on land and reduce the prospect of sustainable development”.

# 750M

People exposed to severe levels of food insecurity, in 2019

# COVID-19

is compounding existing threats to food security and nutrition



<2,5%   <5%   5-14,9%   15-24,9%   25-34,9%   >35%   DATA NOT AVAILABLE

Prevalence of undernourishment in the total population (percent) in 2017-19

Figures from SOFI, 2020  
Map from WFP, 2020

SAVING LIVES  
CHANGING LIVES

World Food Programme



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