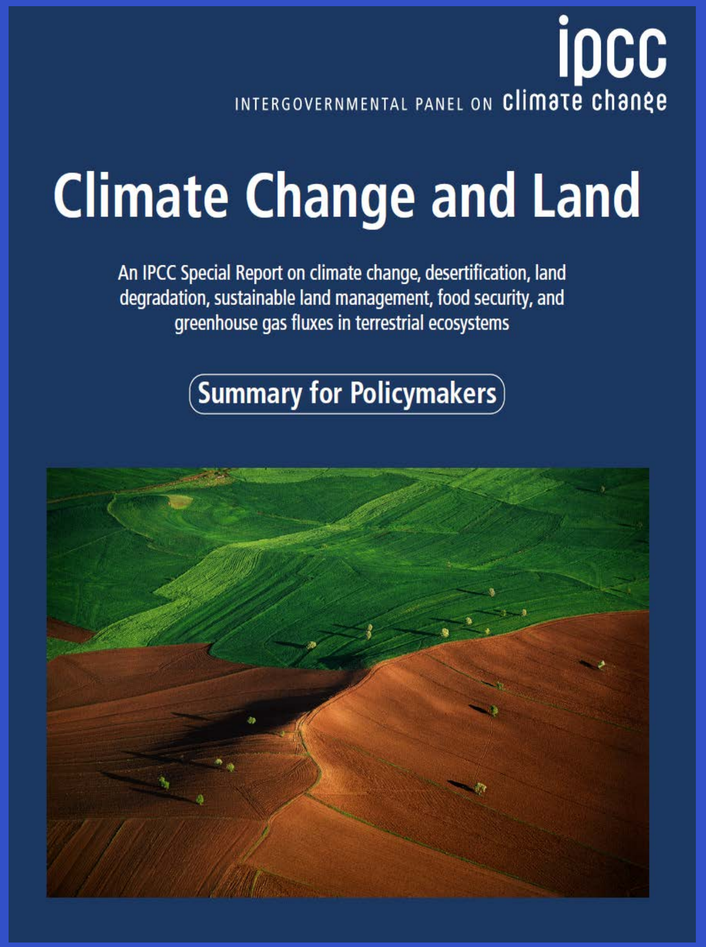
CICERO

IPCC Special Report on: Climate Change and Land



A. S. Daloz, , J. Rydsaa, C.W. Mohr, B. van Oort, J. Sillmann, Ø. Hodnebrog, A. Søvde Haslerud, M. Dotterud Leiren, J. West and E. Andre Hermansen.

Klimamarin, November 12 2019

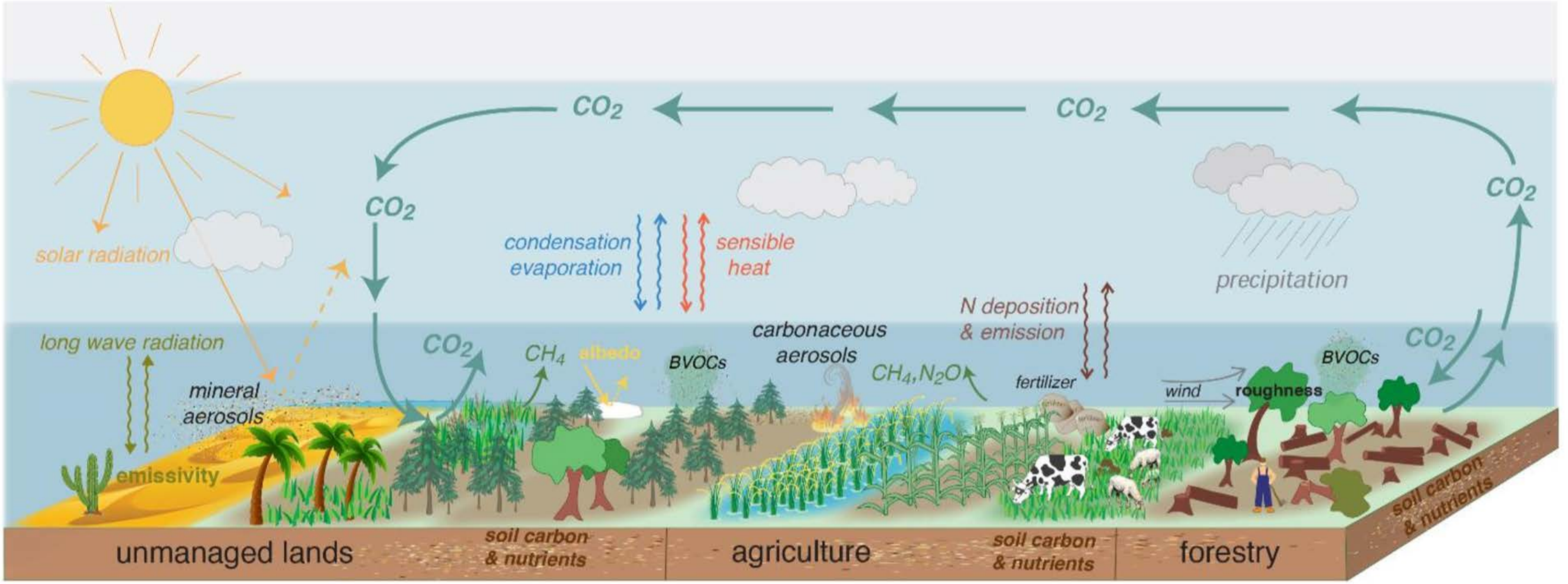
Context

In 2016, the IPCC (Intergovernmental Panel for Climate Change) decided to prepare 3 special reports during the sixth assessment cycle:

1) Global Warming of 1.5 C – October 2018
2) **Climate Change and Land** – August 2019
3) The Ocean and Cryosphere in a Changing Climate – Sept. 2019

Human use directly affects more than 70% of the global ice-free land surface.

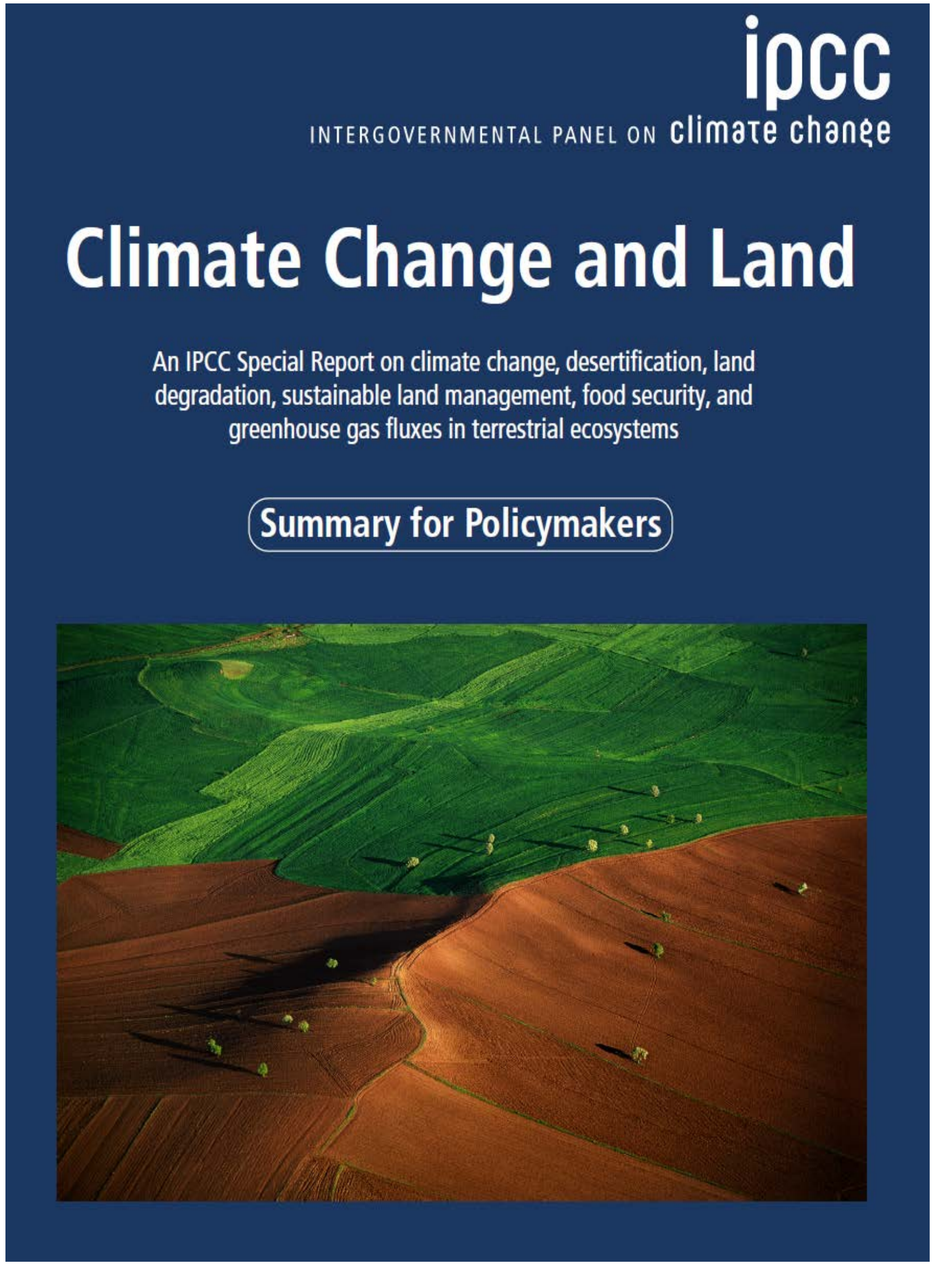
Land-climate interactions



Title

IPCC special report on

Climate Change, Desertification, Land degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems.



Land degradation

Definition: « **All negative changes** in the capacity of the **ecosystem** to provide goods and services» FAO.

1/4 of the Earth's ice-free land area is subject to human-induced degradation.

Wind erosion



Source: graincentral.com

Water erosion



Source: agric.wa.gov.au

Examples

- It is estimated that the total annual cost of erosion from agriculture in the USA is about US$44 billion/yr.
- On a global scale the annual loss of 75 billion tons of soil costs the world about US$400 billion/yr.

Desertification

Definition: “Land degradation in dryland areas and/or the irreversible change of the land to such a state it can no longer be recovered for its original use.” FAO

½ billion of people live in an area which experiences desertification.



Source: cahnrs.wsu.edu



Source: Borgen Magazine

Example

2/3 of Spain could become a desert by the end of the century.

Food Security

1/3 of the food produced is lost or wasted.



Source: creativelyunited.org

Strong Social Inequities

821 million of people undernourished while 2 billion adults are overweight or obese.

CIXPAG project (2015-2019)

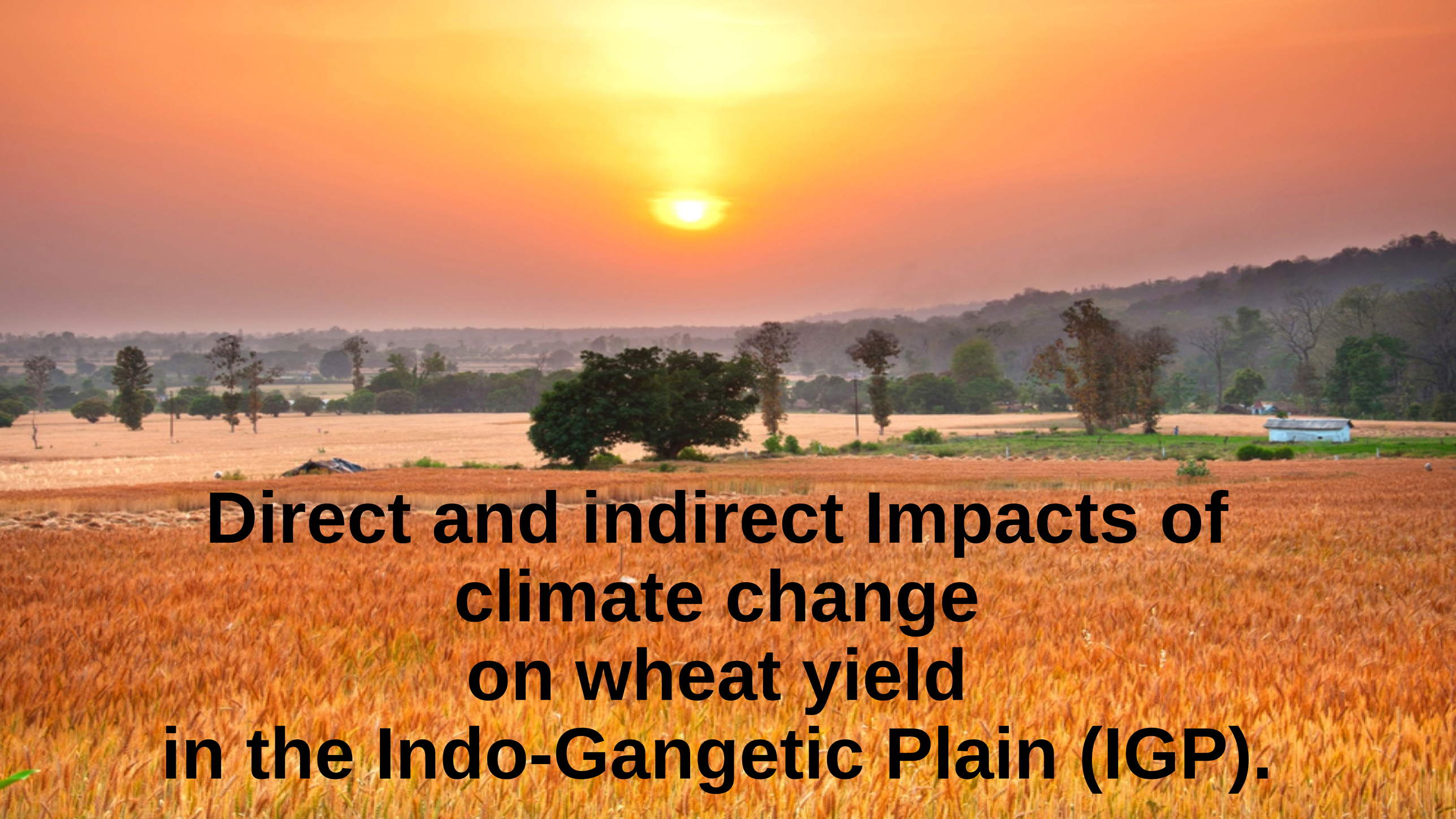
Investigation of the Interactions between:

climate extremes, air pollution & agro-ecosystems



Source: Shutterstock

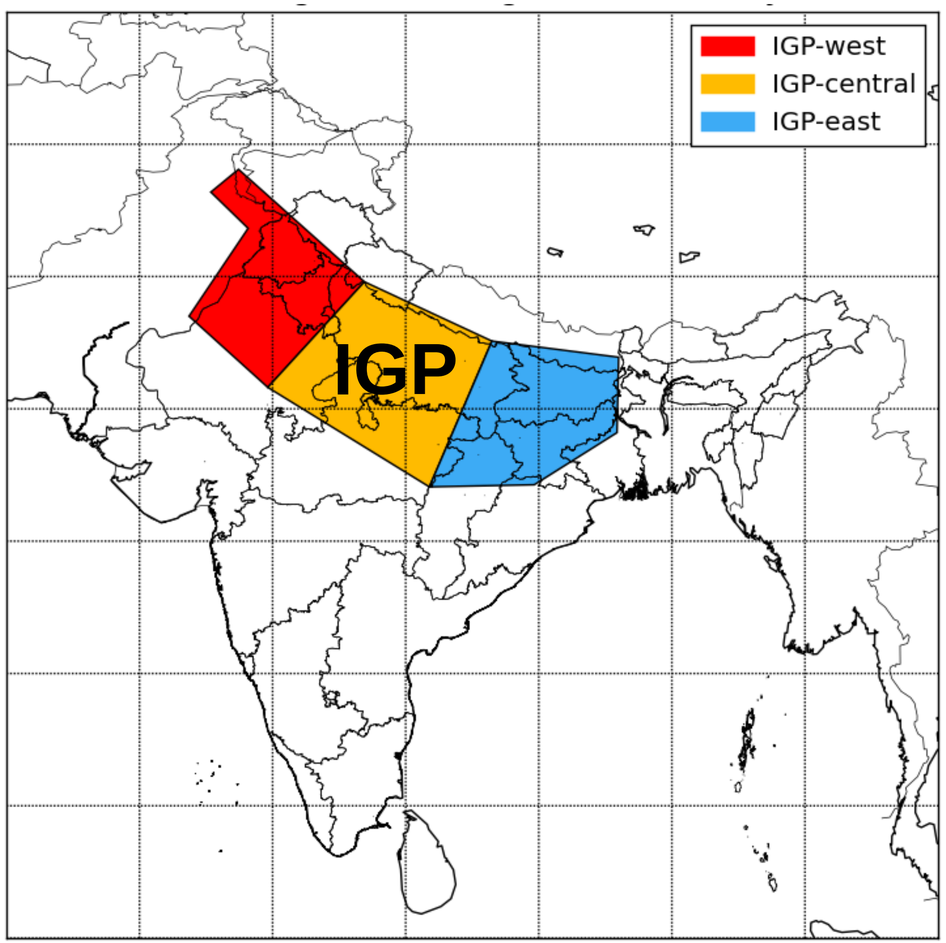
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Direct and indirect Impacts of climate change on wheat yield in the Indo-Gangetic Plain (IGP).

The Indo-Gangetic Plain, India

Indo-Gangetic Plain (IGP)



- The IGP produces **food for 40%** of India's 1.2 billion **population**.

- The **main crops** are:
wheat, maize, rice, millets, pulses, sugarcane and oil seeds.

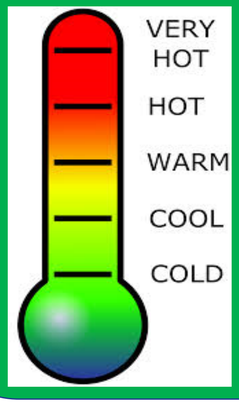
- Indian farmers have to deal with **different types of risk**, one of them is climate change.

Impact of climate change on the IGP

Climate Change

1

Changes in:

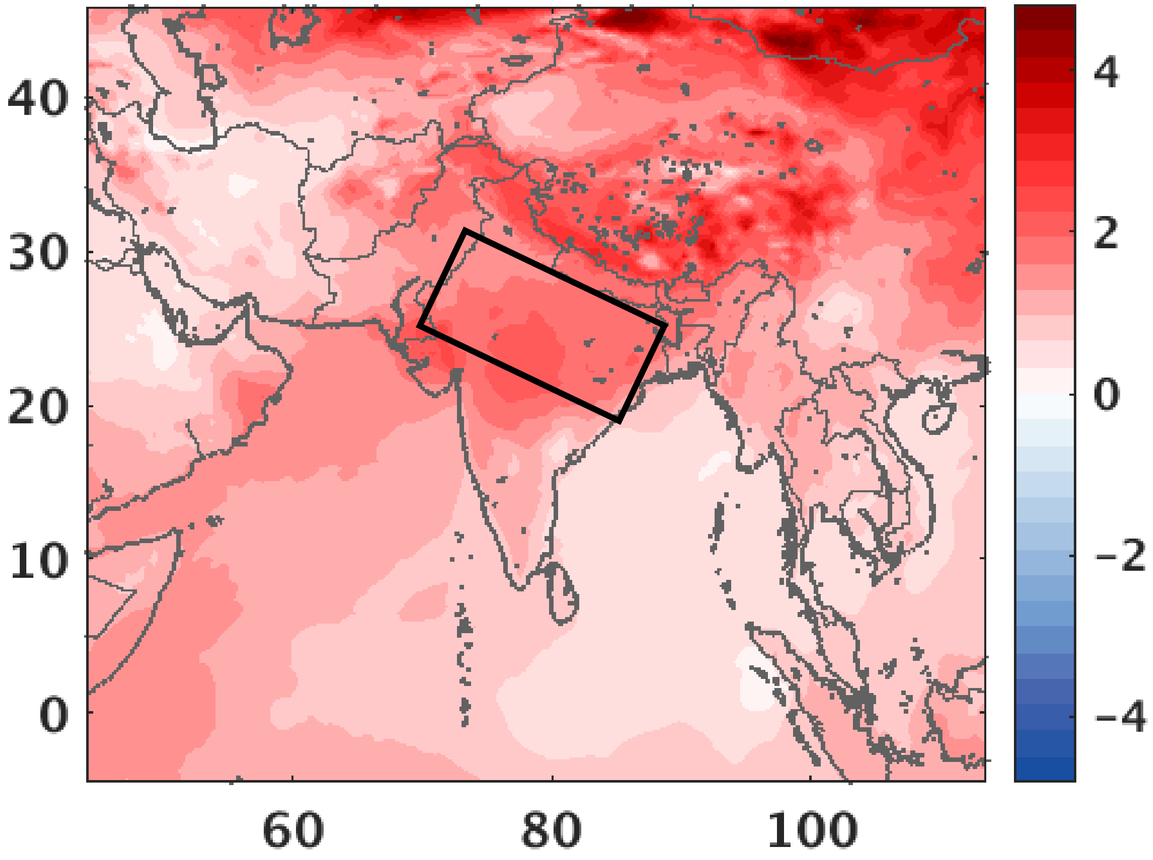




Impact of climate change on the IGP

RCP8.5 – Historical
Growing season

Change in 2 m temperature (°C)



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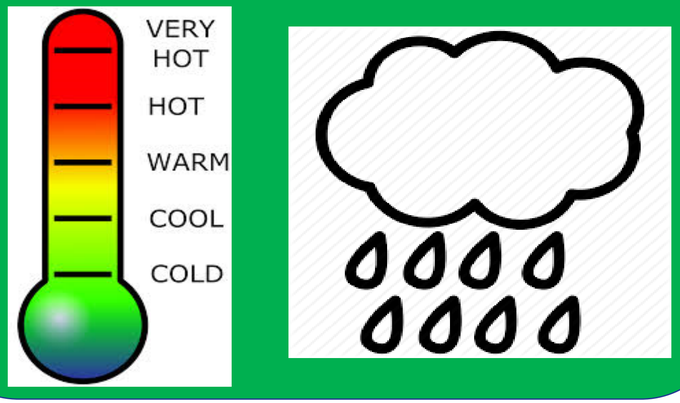
Daloz et al. In prep.

Impact of climate change on wheat yield

Climate Change

1

Changes in:



2

- 5%



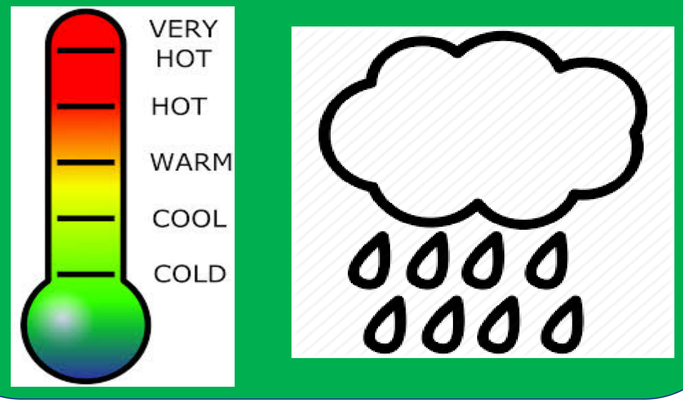
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Impact of CC on wheat yield

Climate Change

1

Changes in:



Changes in water availability

Limited irrigation

3 - 30%

2

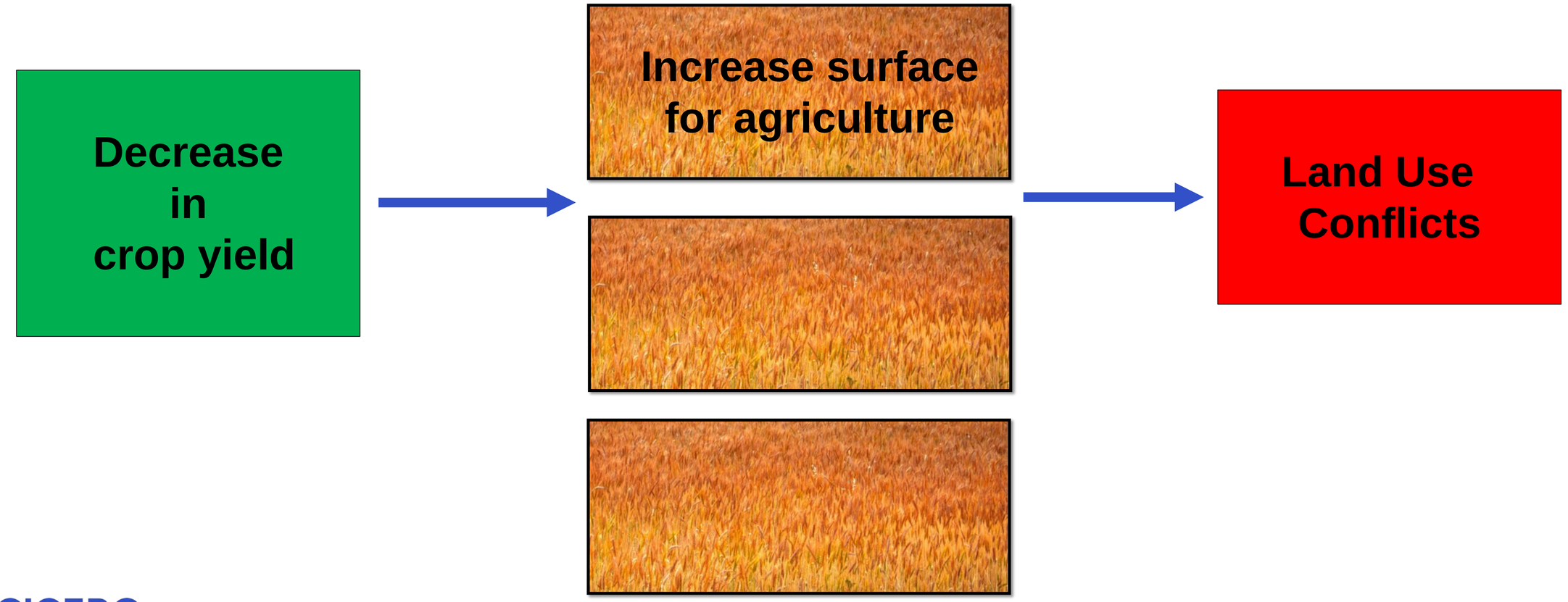
- 5%



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Conclusion Part 1

- **Food production** is a **major concern** for the coming decades,
- The **total food system** contributes to approximatively **1/3 of GHG** emissions.



And for Norway?



Regional warming and climate shifts

Migration of the treeline to higher altitudes



Source World Atlas

Thawing of permafrost



Source Nature.com

And for Norway?



Increase in Wildfires



Source The Guardian



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Conclusion Part 2

- Lands in **Norway** will be (and are) **impacted by Climate Change**,
- How can **Norway achieve its international and national goals** in terms of climate and biodiversity?

Norway's national and international goals





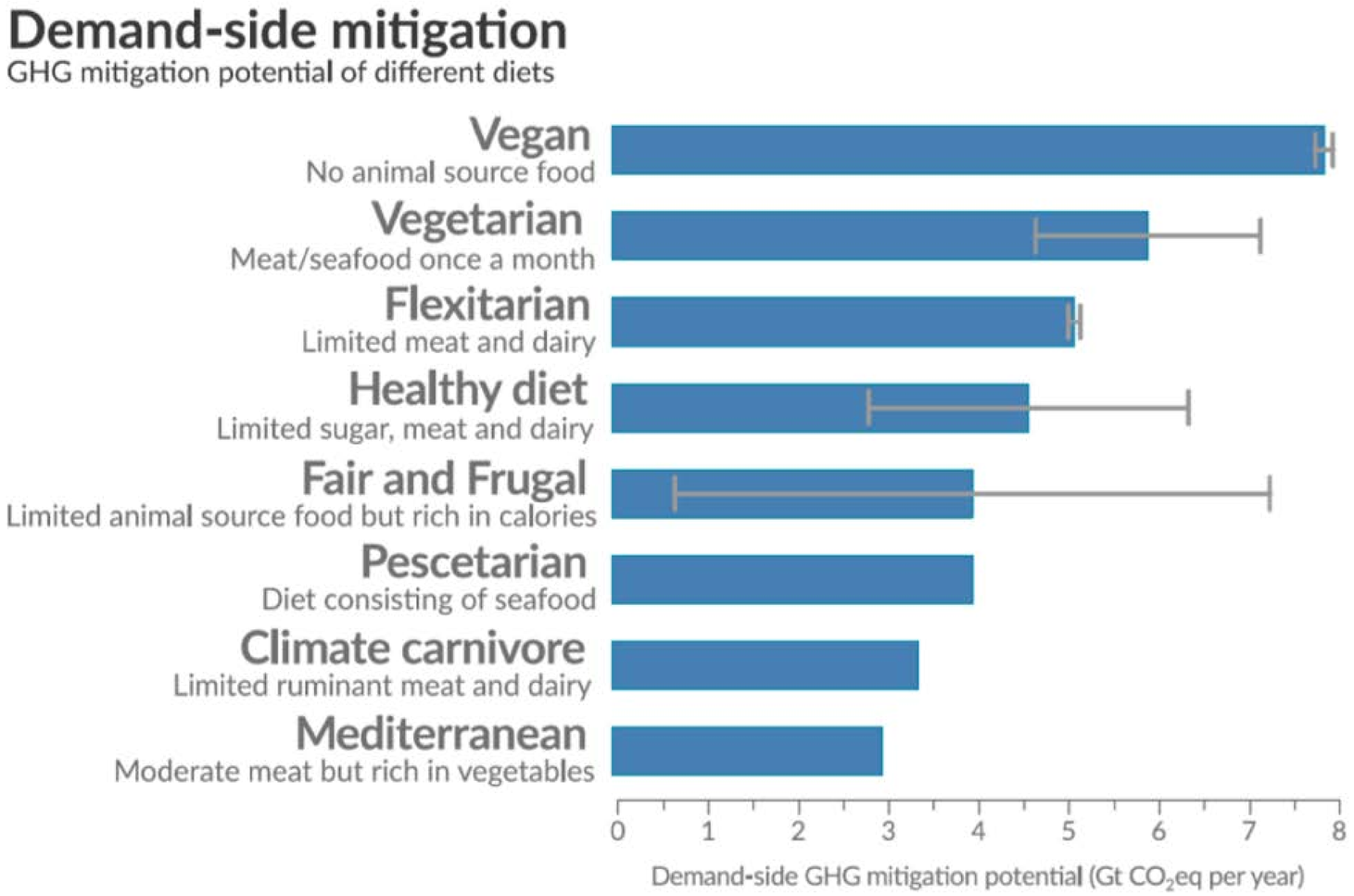


Land Use Conflicts

Summary

Problem	Solution	Limitation
Land is under growing pressure	Land is part of the solution	Land can’t do it all
Human Use & Climate Change	**Afforestation, Renewable Energy, BECCS, etc …**	**Change of diet, Consumption, etc …**

Solutions: Change in Diets



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