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# Land cover change and challenges for climate adaptation in Sahel

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# Outline

- Overview of the Sahel

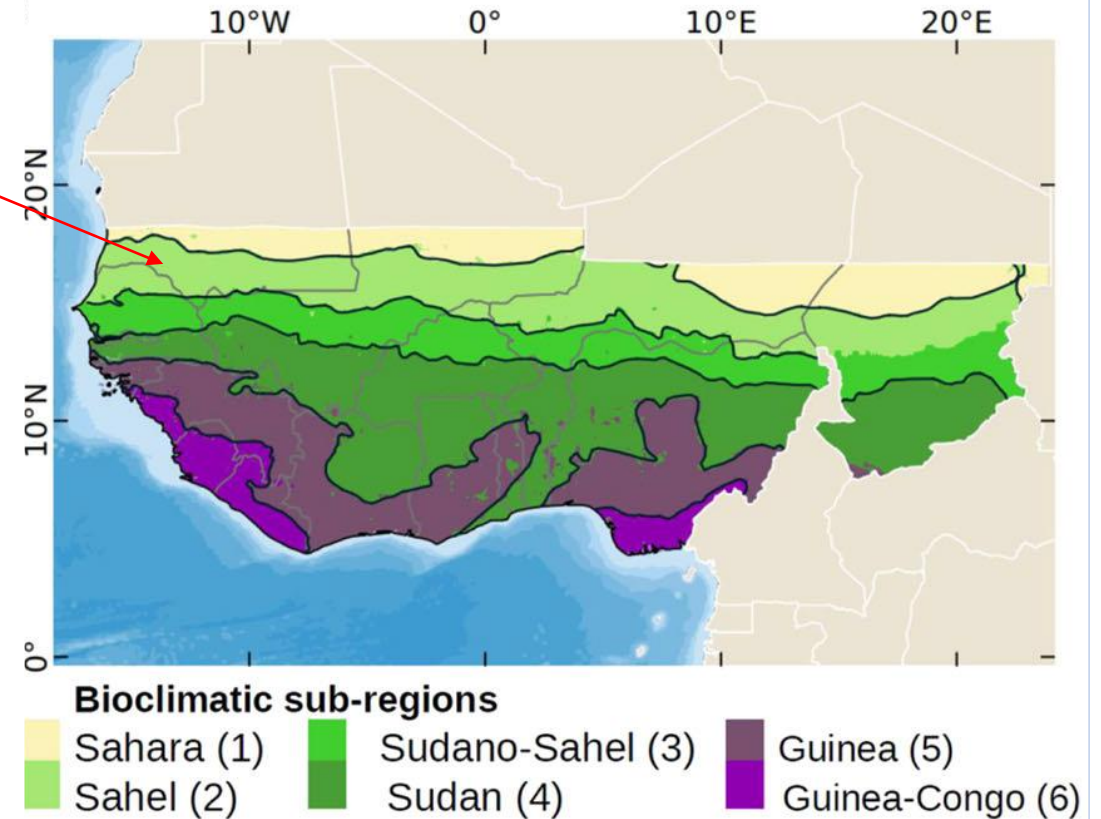
- Climate change in the Sahel

- Land cover change in the Sahel

- Land cover change-induced challenges for adaptation

# Overview of the Sahel

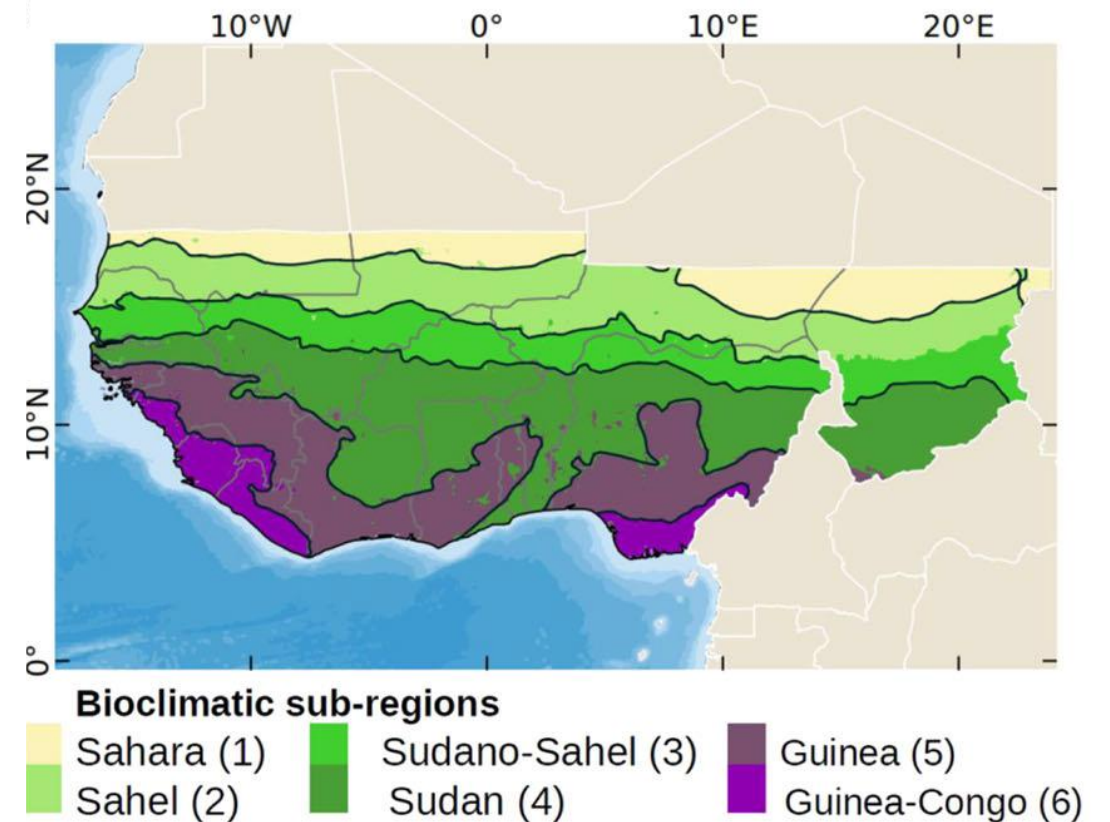
- ❑ **Geographically:** zone between the Sahara in the north and the tropical savannahs in the south.
- ❑ People depend largely on ecosystem goods and services for their livelihood
- ❑ **Main livelihood activities:**
  - Agriculture
  - Livestock



# Overview of the Sahel

## The Sahel: Ecosystem threatened by:

- anthropogenic activities  
(Agriculture, overgrazing...)
- But also **climate change**



# Climate change in the Sahel

- ❑ The Sahel is already facing the impact of climate change and its dramatic consequences on people's livelihoods

## What do we noticed?

- ❑ Rising temperature: 1.5 times faster than in the rest of the world
- ❑ Heavy rains with recurrent floods
- ❑ Rainfall deficits: drought events



# Climate change in the Sahel

- **Several adaptation strategies, technologies and measures have been adopted to face climate change**



Half-moon (Source: IFAD)



Implementation of the contour stone line. Photo: Hien F



The Zai technique for restoration of degraded land. Photo: Hien and Fatondji

# Climate change in the Sahel

Four categories of adaptation actions according to Epule et al. (2017)

<b>Adaptation categories</b>	<b>Adaptation actions</b>
<b>Technically related adaptation options</b>	Water Harnessing ; Soil conservation ; Climate monitoring Early harvesting; Mixed farming
<b>Indigenous problem solving adaptation options</b>	Income diversification; Migration/relocation ; Farm inputs; Pasture management; Buying food/government relief
<b>Socially related problem solving options</b>	Help from kin/social organizations; Spiritual/prayers/religion; Partnership between local people and development project; Creating local committees for natural resources management; Investing in education of kids
<b>Economics related adaptation options</b>	Market gardening; Savings; Selling of personal belongings; Access to credits; Remittances

# Land cover change in the Sahel

**However:**  
changes in land cover induce  
challenges to efficient adaptation  
to climate change in the Sahel





# Land cover change in the Sahel

## **In the past decades**

❑ The Sahel has experienced significant changes in land cover that are reflected mainly in :

- Cropland expansion
- Expansion of human settlement
- Increasing of bare land
- Reduction of natural vegetation covers (savanna, steppes)

# Land cover change in the Sahel

## Main causes of land cover change

- Urbanization
- Prolonged droughts
- Decrease in annual precipitation
- Rapid population growth
- Growing demand for wood

# Land cover change: challenges for adaptation

## Challenges for adaptation



### ❑ Cropland expansion and increasing bare land

- Increasing soil degradation and the risk of low crop production which increases vulnerability to food insecurity
- Reducing fallow lands
- Loss of natural vegetation cover

Affecting adaptation to climate change

# Land cover change: challenges for adaptation

## Challenges for adaptation

### ❑ Expansion of human settlement

- Building in low lands which increase flooding vulnerability
- Loss of natural vegetation cover due to urbanization

Affecting adaptation to climate change

# Land cover change: challenges for adaptation

## Challenges for adaptation

### Reduction of natural vegetation covers

- ❑ *Loss of ecosystem goods and services*
  - Forest degradation-induced CO<sub>2</sub> emission in the atmosphere
- ▶ • Increasing of land degradation and risk of food insecurity
- Loss of habitats for flora and fauna

Affecting  
adaptation to  
climate change

- ❑ There is therefore a need to monitor land cover change for more sustainable land use and efficient adaptation to climate change in the Sahel



**Thanks!**