

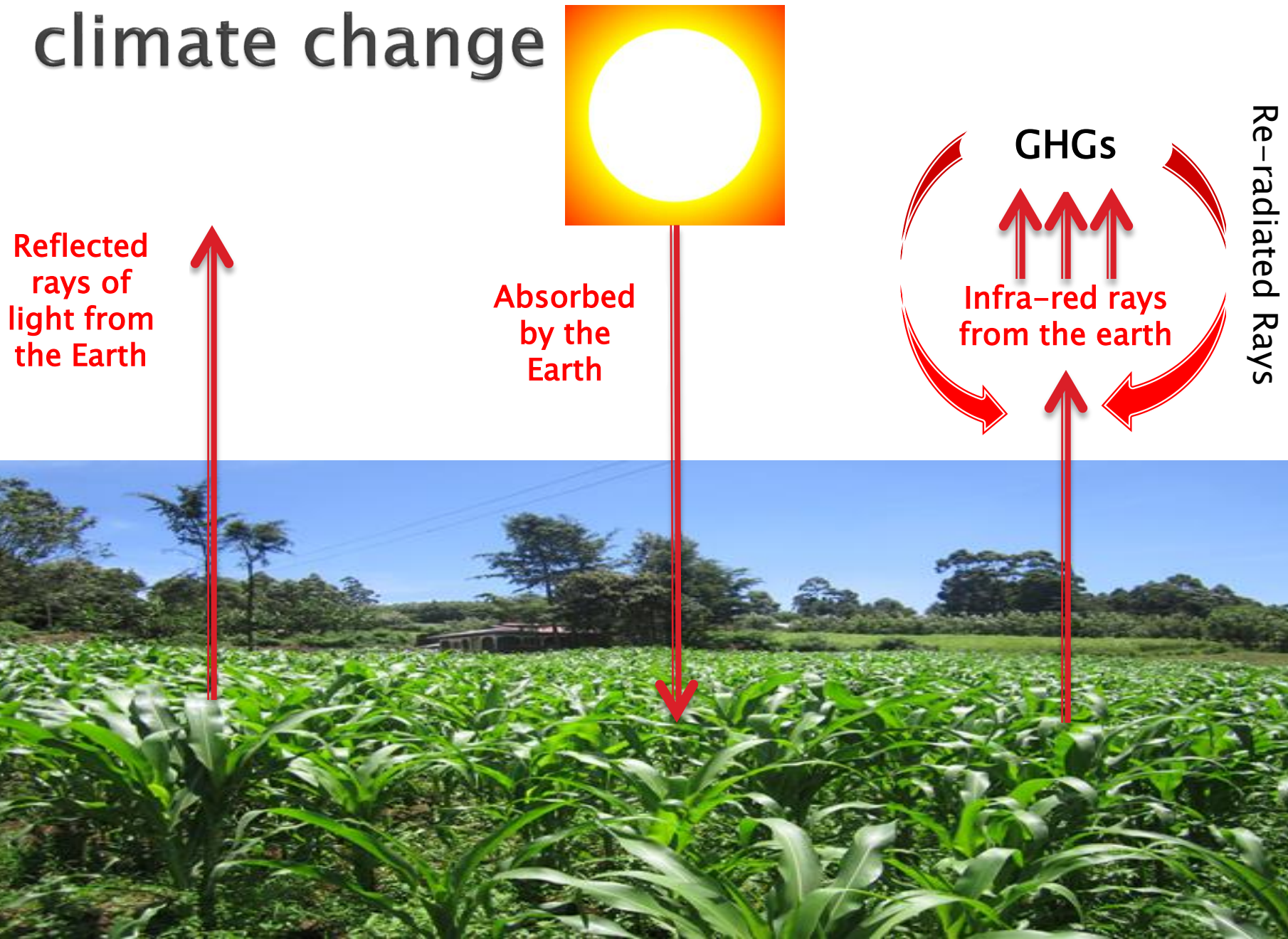
# CLIMATE CHANGE IN THE TROPICAL AFRICA

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# Radiation process that leads to climate change



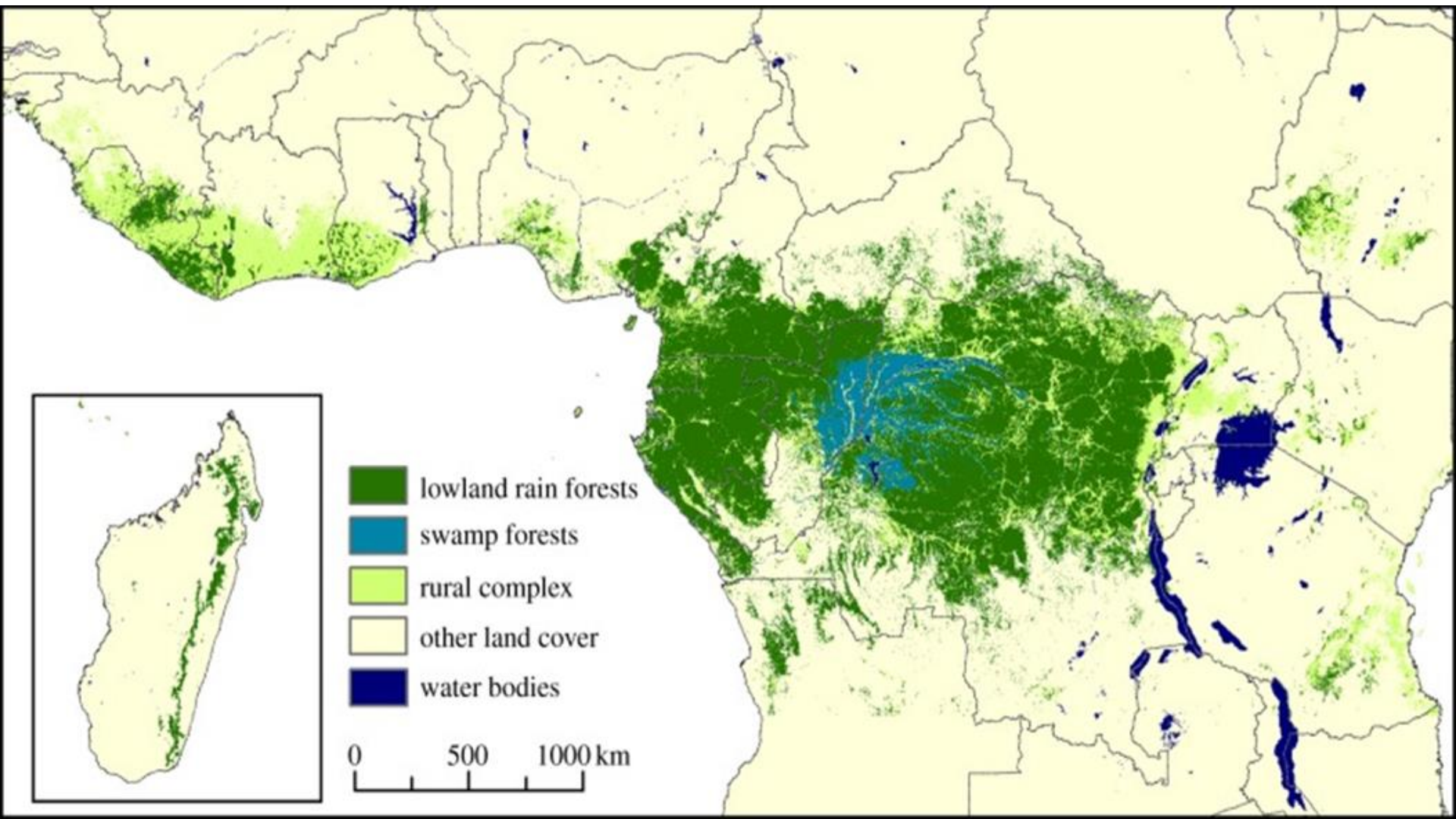


# Climate Change in the Sub-Saharan Africa

A person wearing a light-colored, long-sleeved garment is walking away from the camera across a vast, dry, and cracked landscape. The ground is parched and covered in a network of deep, irregular cracks. The horizon is flat with some sparse, low-lying vegetation in the distance. The sky is a clear, pale blue.

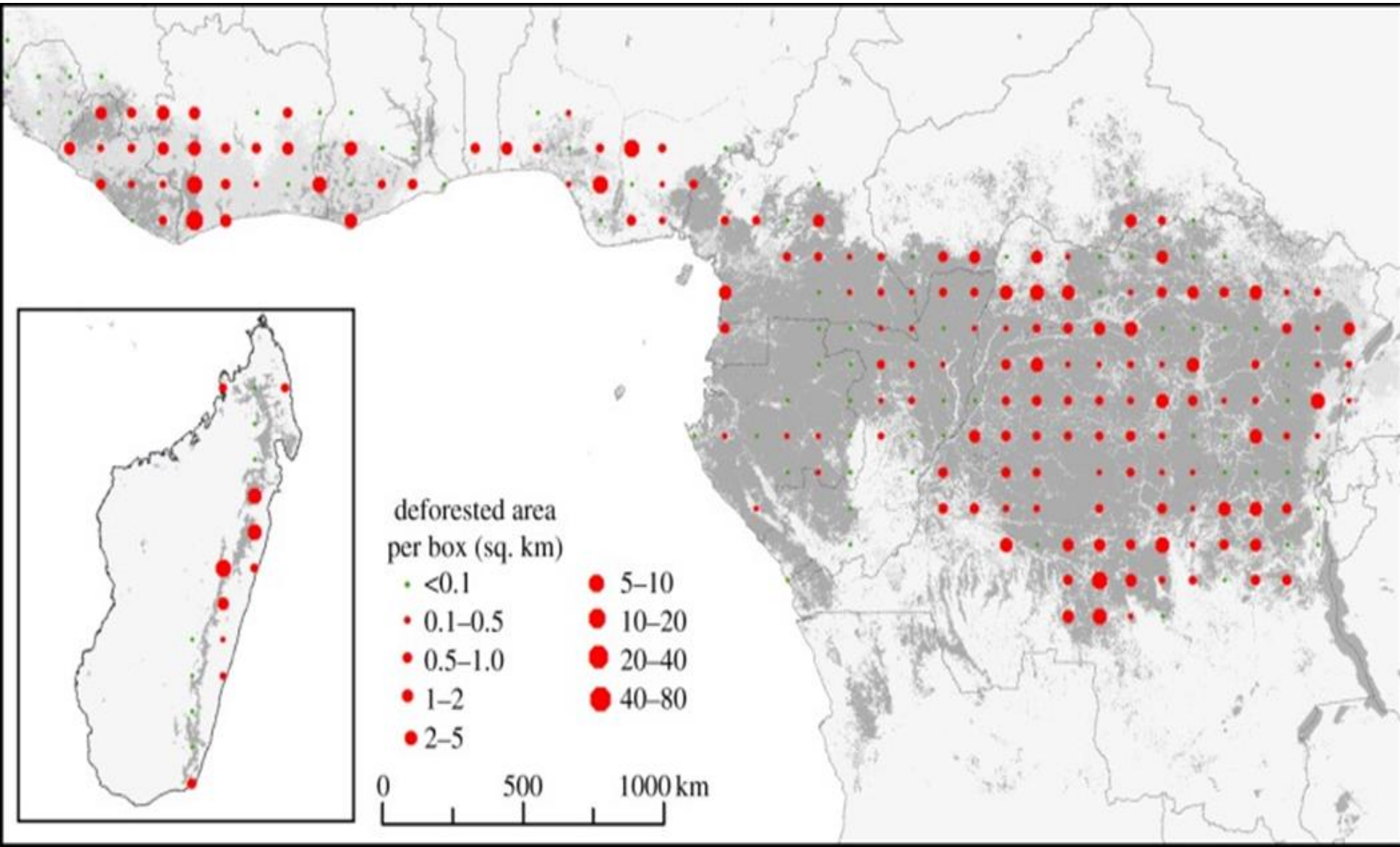
“Africa as a whole is one of the most vulnerable continents due to its high exposure and low adaptive capacity”

# Our Environmental Patrimony in the Sub-Saharan Africa





# ...Threatened by Human Practices





# Stresses at various scales:

- ▶ High population growth rates
- ▶ Underemployment
- ▶ Low literacy rates
- ▶ Food security challenges
- ▶ Health issues; weak health systems
- ▶ Low investment in adaptive technologies
- ▶ Shortages of skills
- ▶ Poor governance



# Significant Concern

## Direct reliance on environment for Local Communities:

- Arable & pastoral agricultural practices
- Fishing
- Harvesting of natural vegetation
  - Shelter
  - Fuel
  - Food
  - Medicines
  - Craft



# Impacts of C.C.

## Weather Patterns:

- ▶ Equatorial Forest regions:
  - Increase in warm extremes by about 0.25 degree (c)
  - Decrease in the occurrence of cold spells

*Floods in Sierra-Leone, West-Africa, August 2017*



# Impacts: Weather Patterns

- ▶ Savannah regions:
  - Extreme rainfall events and droughts

*Severe droughts in the Kenyan Regions  
2016*



- 
- **Floods**
  - **Landslides**
  - **Soil Erosion**
  - **Crop Damage**
  - **Spread of Vector**



# Impacts: Crops/Plants

- ▶ Equatorial Forest Regions:
  - Parasites/Pests: reducing yields

*Healthy Cassava*



*Cassava Brown  
Streak Disease  
(CBSD) symptoms on  
tubers*



*Cassava tuber (right)  
attacked by parasites*





# Impacts: Crops / Plants

- ▶ Savannah Regions:
  - Transboundary plant pests and diseases

*Desert Locust*



*Armyworms*



*Wheat Rusts*





# Impacts: Soil/Land

- ▶ Equatorial Forest Regions:
  - Agricultural intensification
  - Land Conversion
  - Wood Exploitation

*Burning of forest prior to cultivation*



Reduction in soil nutrient

Soil Erosion

Land Degradation

# Impacts: Soil/Land

- ▶ Savannah Regions:
  - Intensification of Chemical Fertilizers
  - Land Conversion
  - Firewood / Charcoal

*Land Degradation at Rusinga Island,  
2017*



Desertification  
Soil Erosion  
Land Degradation





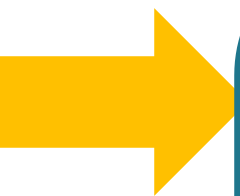
# Extent of the Impacts of Climate Change on Agriculture in the Equatorial Forest

Impacts of C.C.	Mean	Standard Deviation
Declining soil fertility	4.15	1.11
Increased weed infestation	4.10	0.98
Increased heat waves	4.08	1.01
Declining yields	3.96	1.17
Increased rainfall	3.93	1.16
Irregular rainfall	3.89	1.17
Increased pests	3.87	1.13
Increased soil erosion	3.83	1.16
Disease infestation	3.77	1.23
Reduced soil moisture	3.63	1.15
Declining vegetation cover	3.62	1.26

(Nicholas Ozor, 2014)

# Significant Effects of Climate Change on Agriculture

## Weed Infections:

- 
- Importance to weed frequently
  - Diversification of crops planted
  - Use of resistant crop varieties
  - Multiple cropping
  - Increased use of inputs





# Mitigation and Adaptation options

INDIGENOUS KNOWLEDGE



MODERN TECHNIQUES



# Framework for Agricultural Adaptation to Climate Change



Climate Change Impact	Adaption and Mitigation Solutions
Increased in pest & disease infestations	Mixed cropping; Early planting; Use of pest and disease resistant crops; Controlled use of pesticides; Crop replacement
Increased weed growth	Cover cropping; Early planting; Prompt weeding; Regulated herbicide use; Use of weed tolerant crop varieties



# Framework for Agricultural Adaptation to Climate Change

Climate Change Impact	Adaption and Mitigation Solutions
Reduction in moisture/drought	Mulching; irrigation schemes; Use of cover crops; Prevention of forest losses along water bodies
Reduction in soil nutrient	Green manuring; Composting; Mixed cropping; Crop rotation; Fallowing

# Thank you!



**Living in Harmony**

with  
the

**EARTH**