CLIMATE-SMART Agriculture 2015

Global Science Conference

March 16-18, 2015
Le Corum, Montpellier France

# Facing climate variability and extremes

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# Outline

- Climate variability and extremes: some facts
- Impacts on agriculture
- Approaches and practices of Climate information services
- Conclusions

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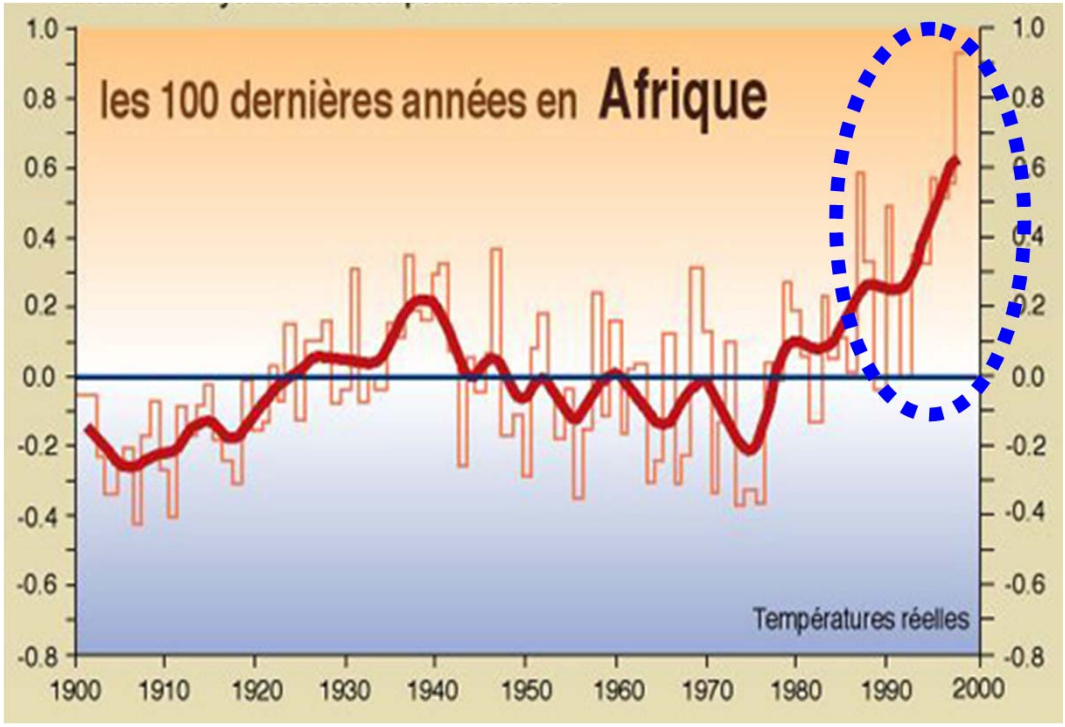
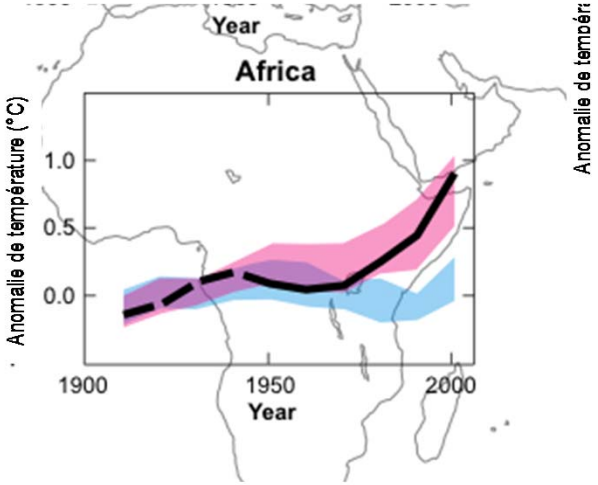
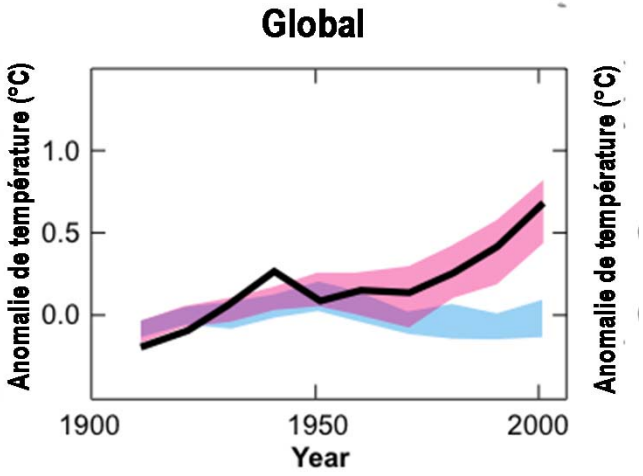
# Climate variability & change : facts!

## For the last 100 years: Unequivocal temperature rise




- Temperature rise of ≈0.6-0.7 C since late 70's
- Largely higher than the global increase
- Sea level rise of 18 cm during the 20th century

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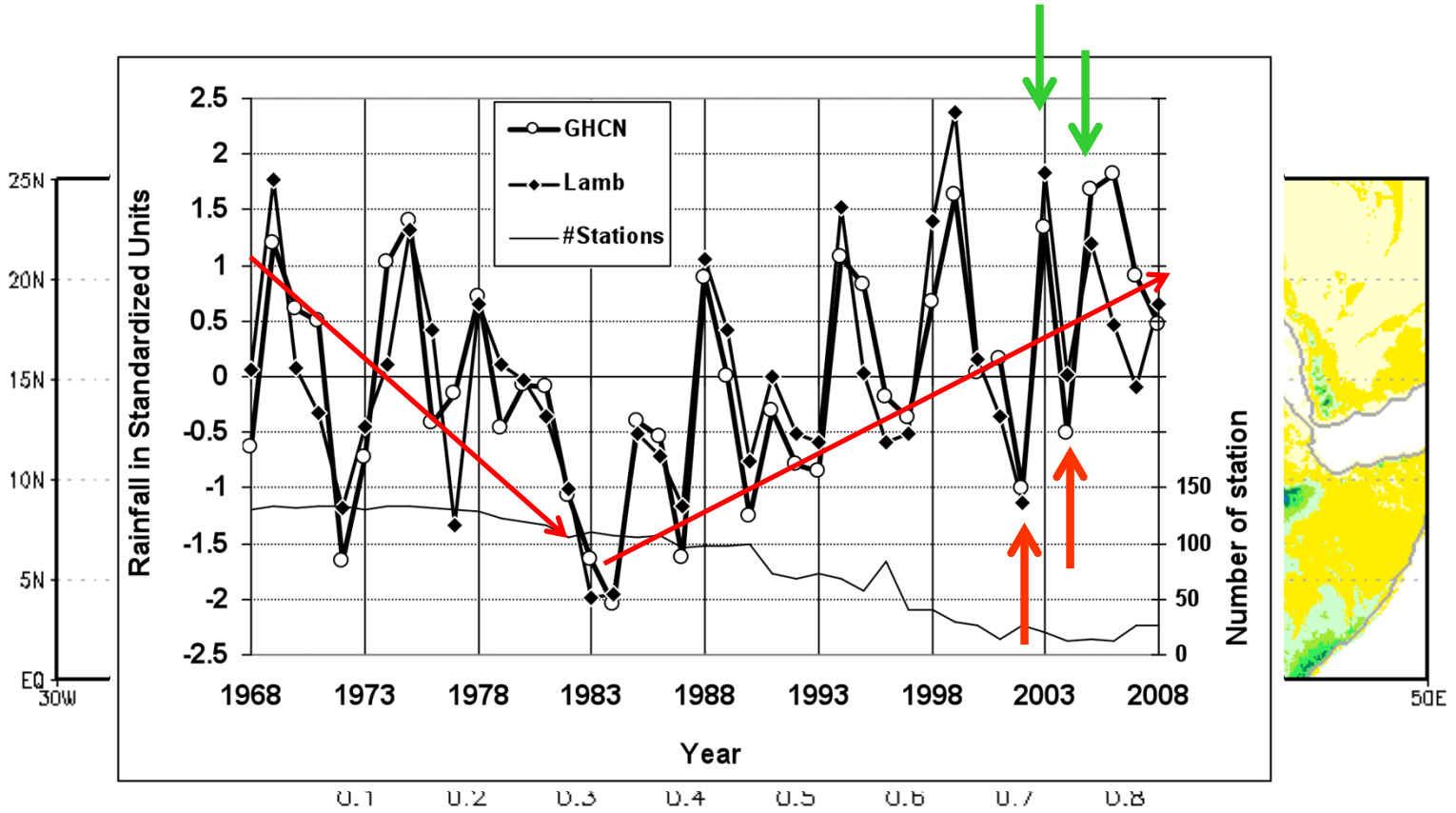
***After Benoit SARR, Aghrymet***

# Climate variability & change : facts!




GHCN Series: 12-20N, 18W-30E

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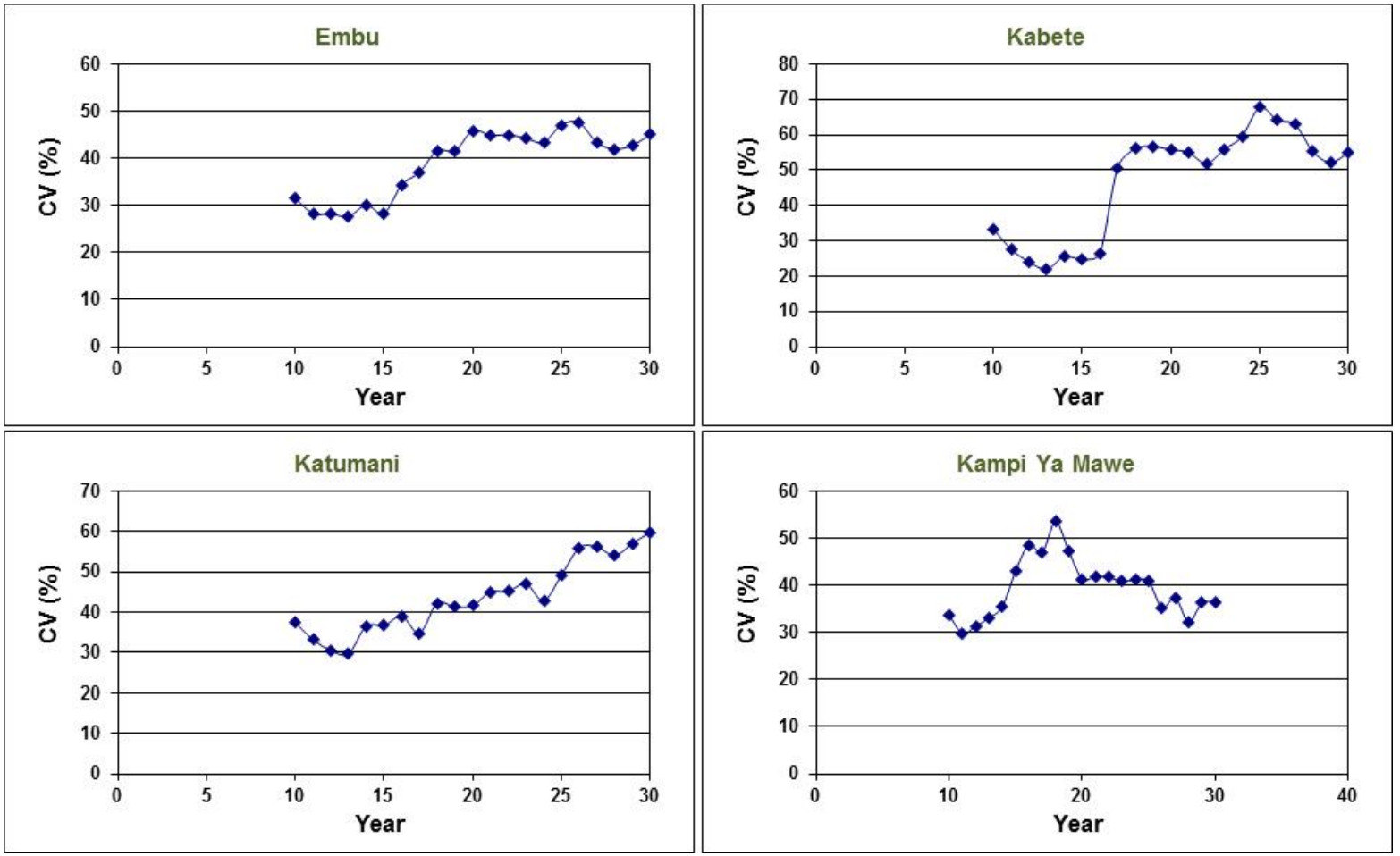
# Change in rainfall variability: Kenya




*Rao et al., 2015*

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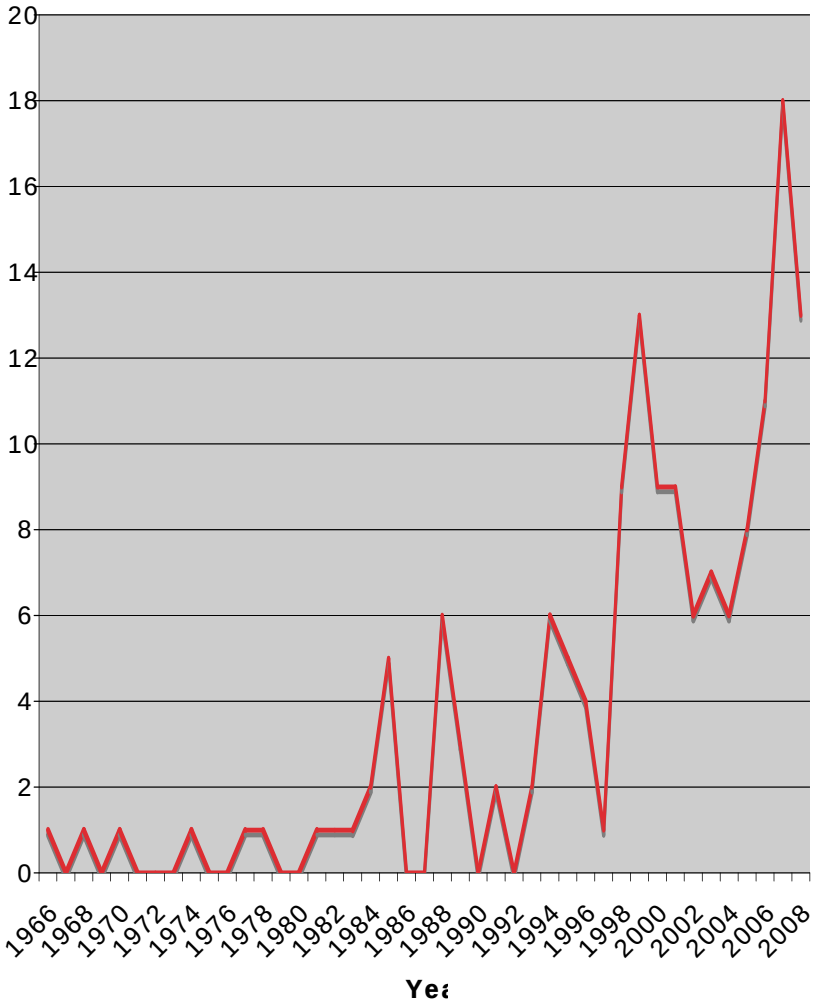
# Climate extremes





**Benin 2008: 25 000 ha (staple crops) & 1204 ha (Cotton); 53 674 farmers impacted. Desaster estimated to 20 million USD.**

# Impacts on agriculture

- Crop, livestock, fisheries, wildlife, vegetation… are impacted
- The impacts can be direct or indirect
  - Grain-fodder production, availability, and price
  - Pastures and forage crop production and quality
  - Disease and pest distributions
  - Animal health, growth, and reproduction
  - Risk associated with the variability and change

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# Climate variability

- Variable climatic conditions create risks as well as opportunities
- Capitalizing on good seasons is as important as avoiding risks

| Location | Yield gap in below, average and above average rainy seasons (kg/ha) | | |
|---|---|---|---|
| | <250 mm | 250-350 mm | >350 mm |
| Kitui | 1941 (5) | 2698 (4) | 2766 (24) |
| Katumani | 282 (22) | 1349 (14) | 2207 (16) |
| Makindu | -95 (18) | 1092 (8) | 2619 (19) |

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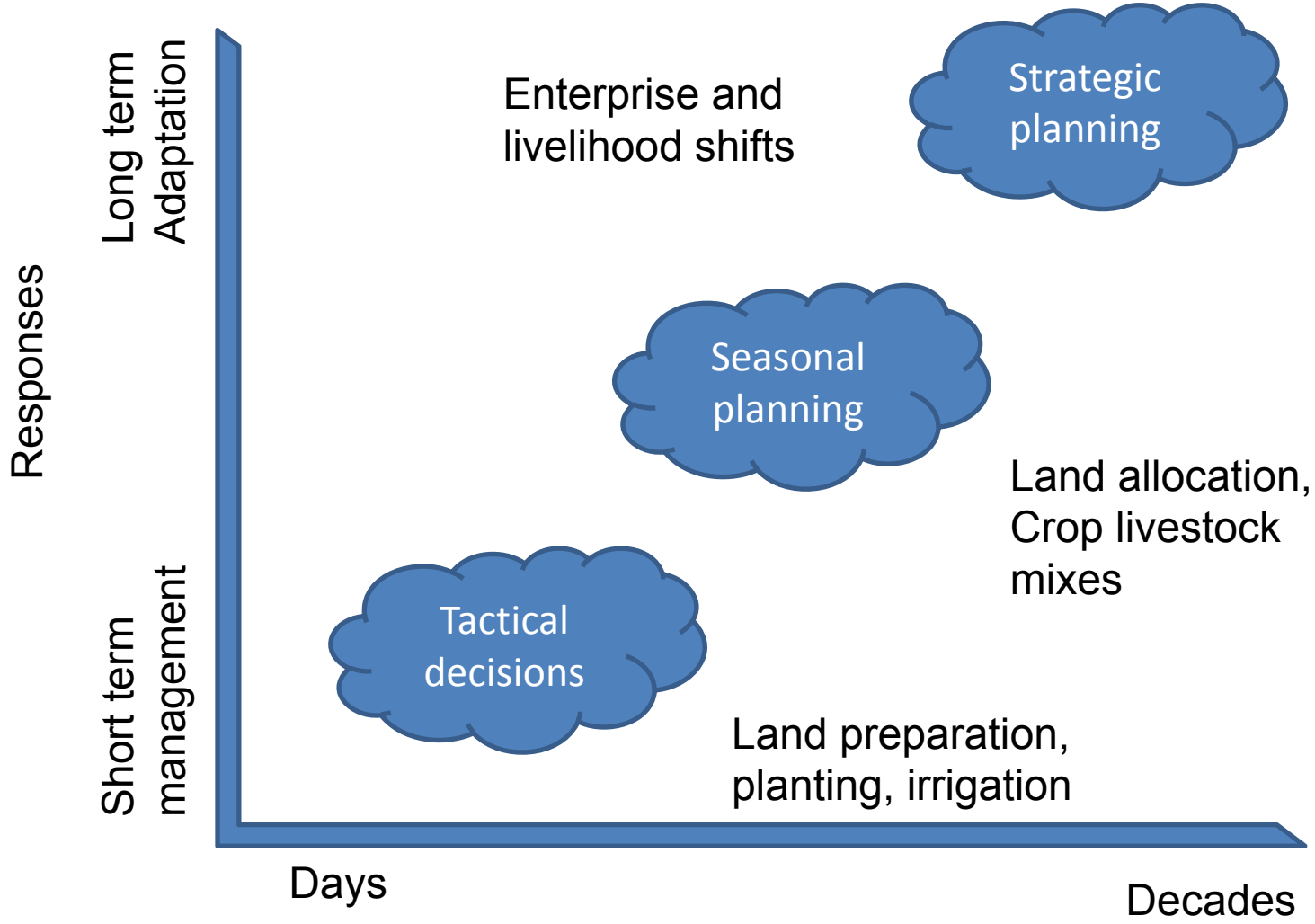
# Responses to variability and change

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# We need CSA approaches, technologies, practices at all levels:

## Some examples

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# Climate information for better planning and management in Senegal

Climate information (indigenous & scientific) help to improve planning and management of farms by smallholder farmers

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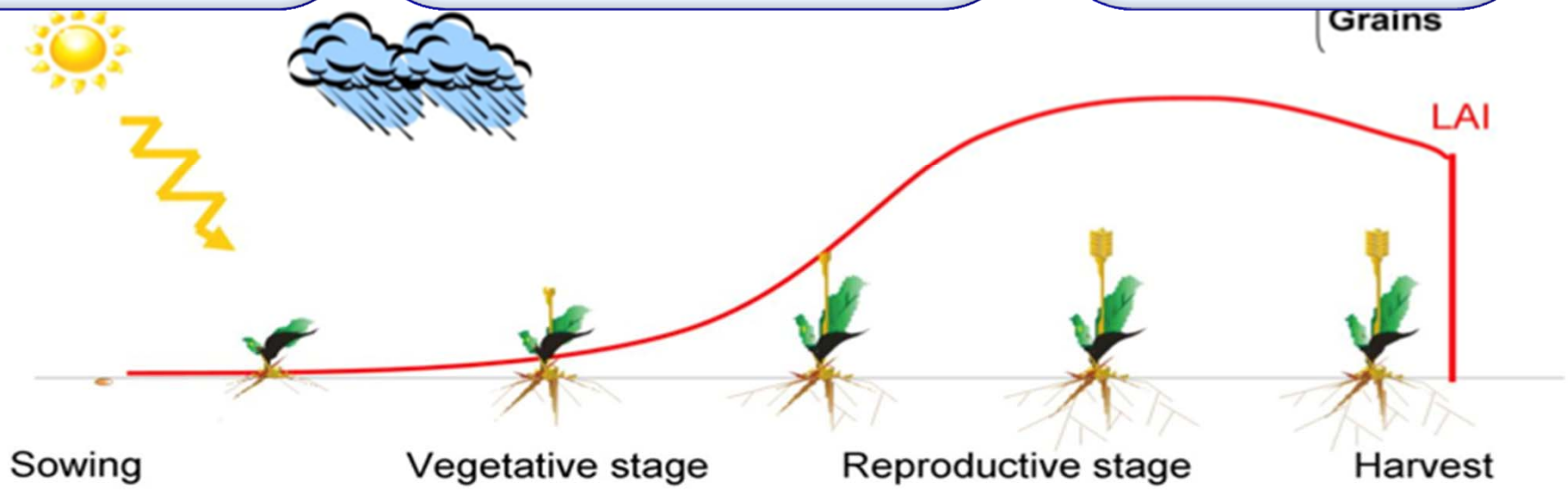
# Climate risk management in Kaffrine : using probabilistic seasonal forecasting

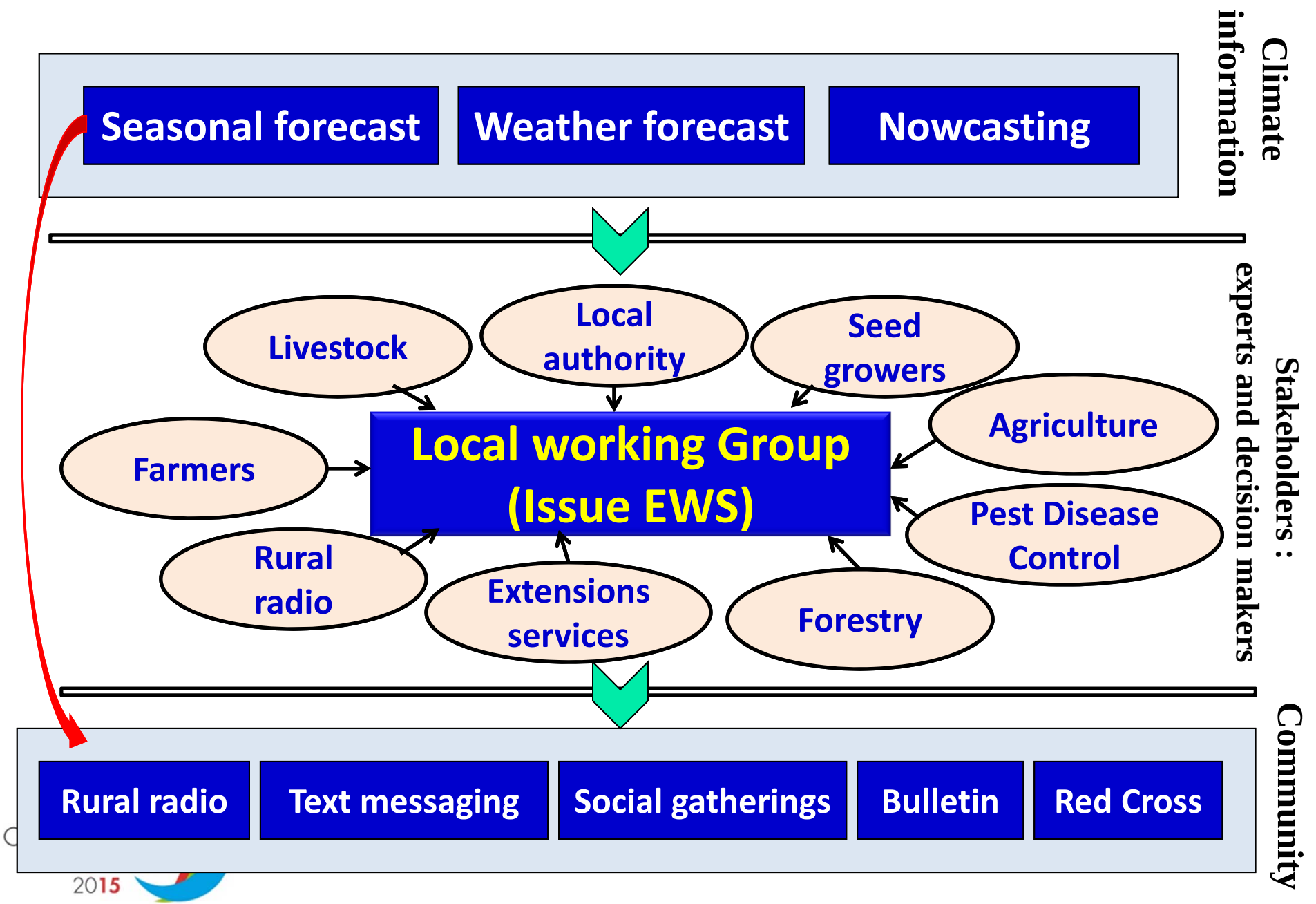
- **Since 2011:** piloting communication of downscaled seasonal forecasts and; evaluating impact on farmers' management and livelihoods (CIS design + GTP)
- **2013:** testing Kaffrine protocol in 3 more regions (Thies, Louga and Diourbel)

# Using climate information for early warning

| Before | During cropping season | Maturity/end season |
|---|---|---|
| **Seasonal forecast**<br>➢ crop variety<br>➢ varieties<br><br>**Onset forecast**<br>➢ farm preparation<br>➢ optimum planting | **Nowcasting**<br>➢ flooding saving life (thunder)<br>**Daily forecast**<br>➢ use of fertilizer / pesticide<br>**Ten-day forecast**<br>➢ weeding, field work<br>**Updating seasonal forecast**<br>➢ second cropping | **Ten-day forecast**<br>➢ optimum harvesting period<br>➢ rain during dry season |



# Partnership for Senegal Early warning system



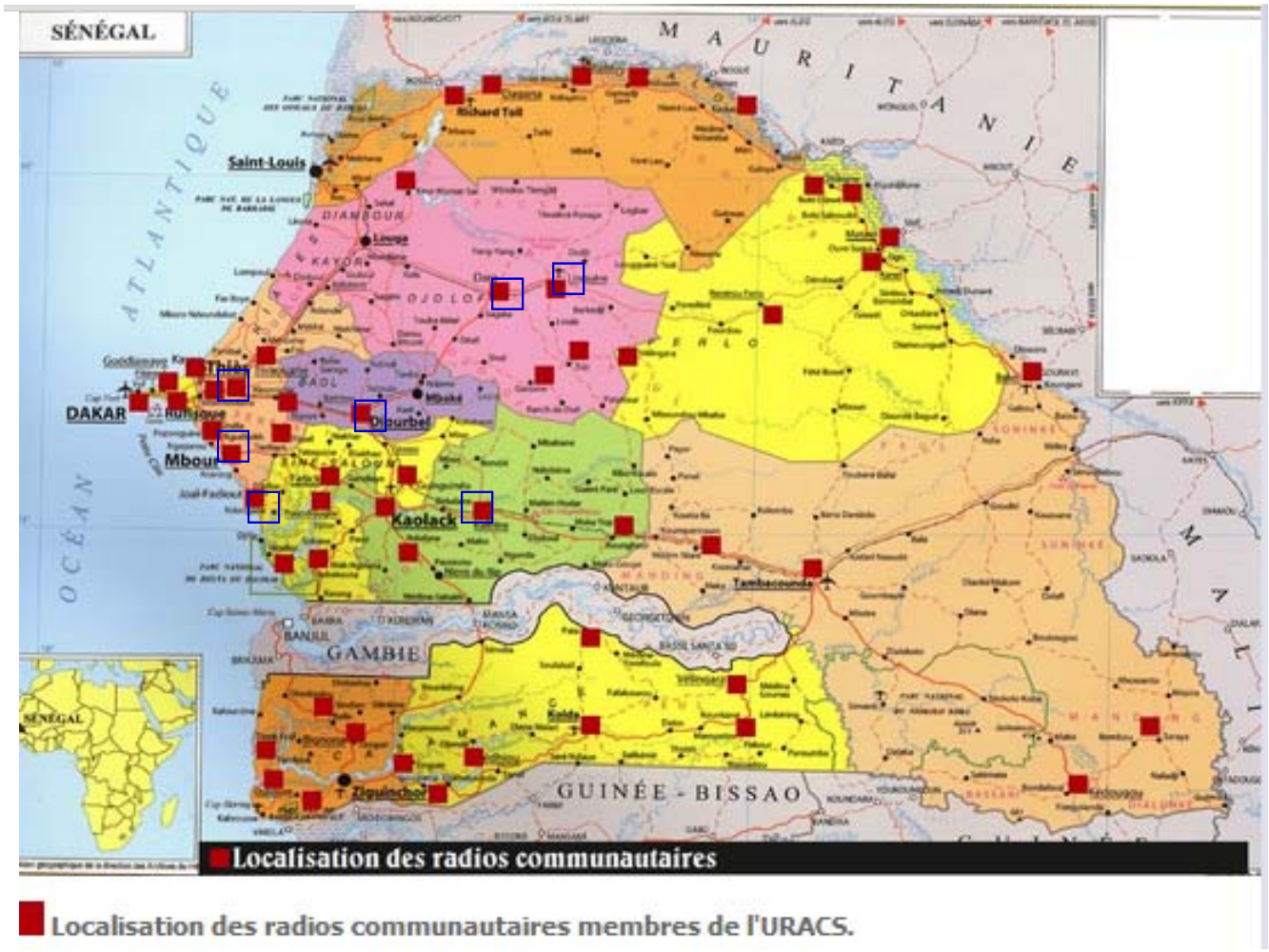
# COMMUNICATION & COMMUNICATION

## partnership with union of rural radio (URAC)

- Présentation
- Oxyjeunes FM
- Afia FM
- Jokko FM
- Coorkat FM
- Voix du Jeguem
- Bamtaaré FM
- Gabou FM
- FM AWAGNA
- Mbour FM
- Ferlo FM
- Blouf FM
- Ndef Leng FM
- Penc mi FM
- Pkumel FM
- Kondafé FM
- Kassoumay FM
- Manooré FM
- Baol FM
- Tewdu FM
- Gassane FM
- CMC de Niodior
- Djolof FM

URAC
Union des Radios Associatives et Communautaires (Sénégal)

**Target: 3 million farmers**




Localisation des radios communautaires membres de l'URACS.

# Colombian rice growers protect their incomes using agro-climate information

In a **good season**,

rice yield per hectare could be up to


In a **bad season**,

yield per hectare can drop as low as


The yield gap can result in an estimated loss worth

**$950/ha**

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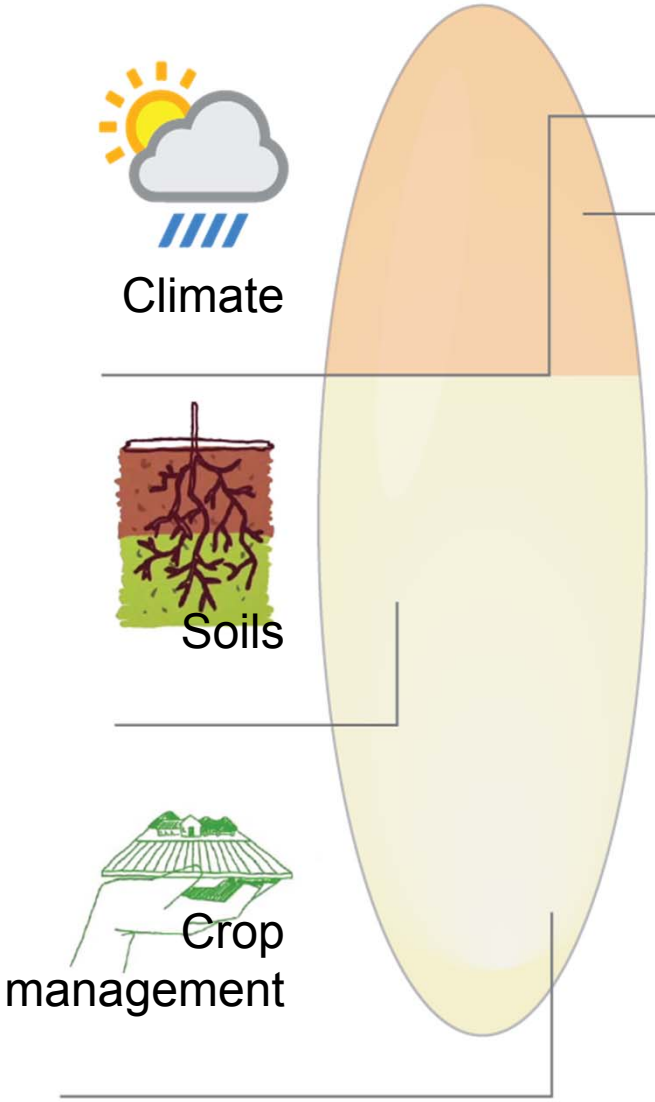
# Difference in rice production affected:




**35%** by climate variability

**Research partnership between Colombian MoA and CIAT/CCAFS found that**

**11%** Is attributed to variations in **amount of sunlight** during grain filling.

## Improvements

- Change the planting date ✓
- Plant more resilient cultivars ✓

# Following these recommendations in the Colombian north coast:


farmers planting


of irrigated rice

**were able to avoid big economic losses**

and the project was the winner
of the UN's Big Data Climate Challenge

UNITED NATIONS CLIMATE SUMMIT 2014 | BIG DATA CLIMATE CHALLENGE WINNERS

MINAGRICULTURA

TODOS POR UN NUEVO PAÍS
PAZ EQUIDAD EDUCACIÓN

CIAT

FEDEARROZ
FONDO NACIONAL DEL ARROZ

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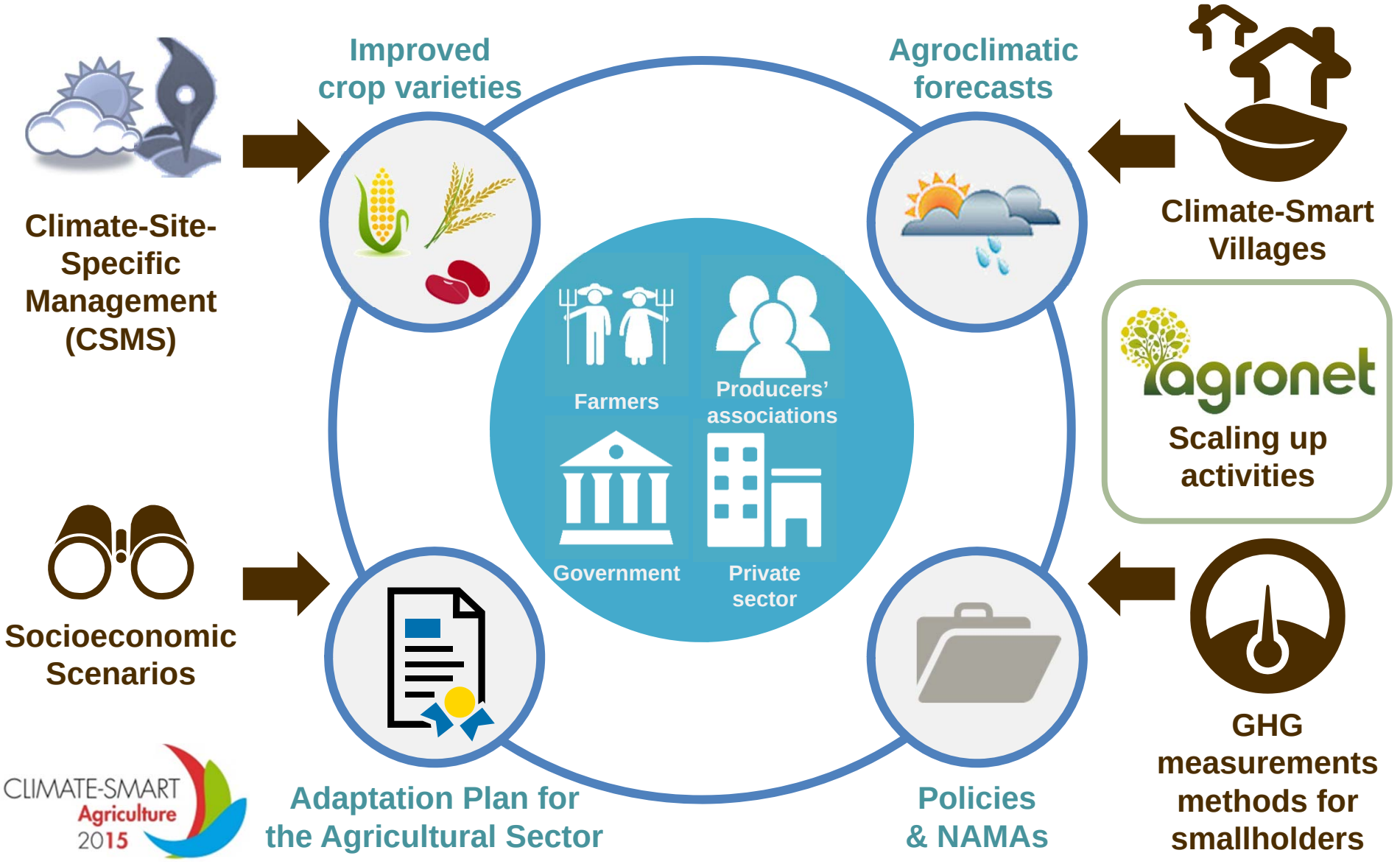
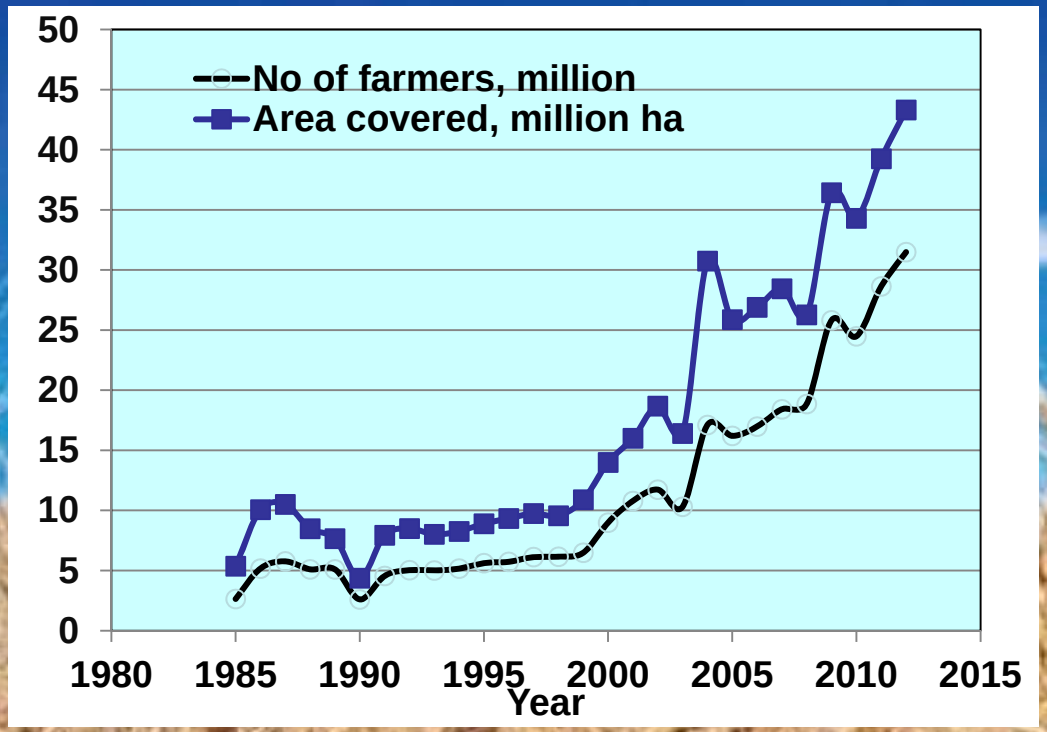
# How this partnership works

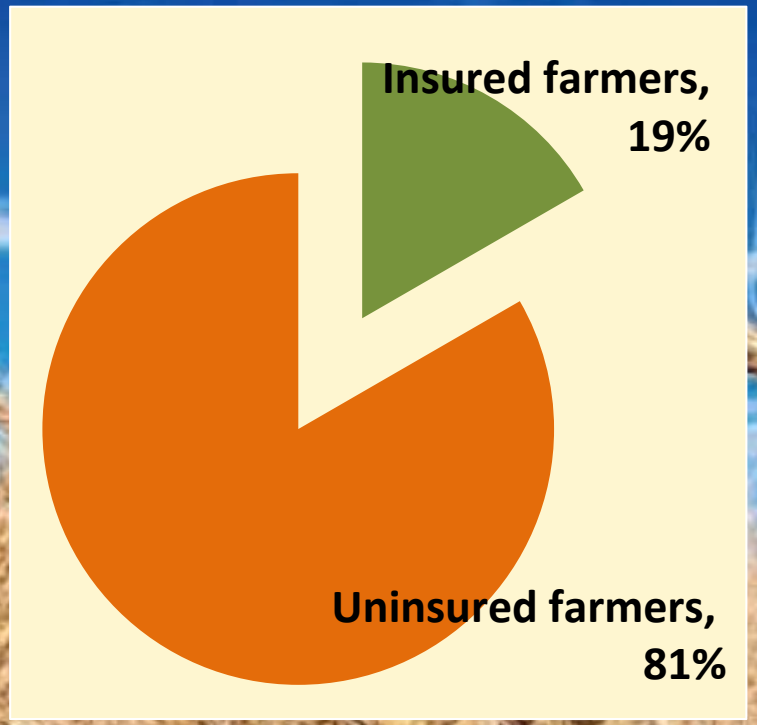
**Clima y Sector Agropecuario Colombiano**
Adaptación para la Sostenibilidad Productiva



# Weather-based crop insurance in India:

## Reaching the Unreached

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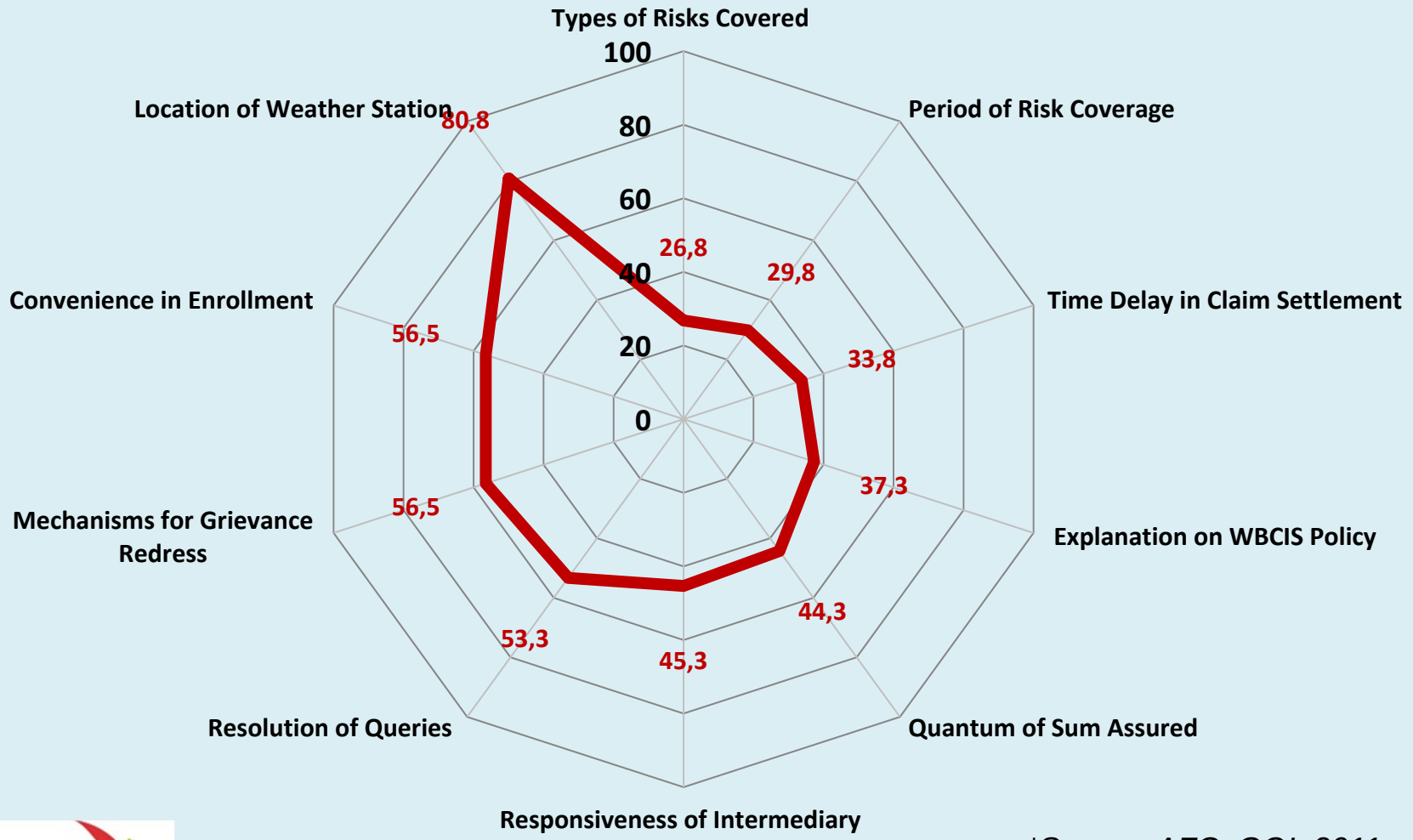
# Top 10 reasons for dissatisfaction in unsatisfied index-insured farmers




*Source: AFC, GOI, 2011

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# Scaling-out crop insurance: Key actions

- **A ‘scientific’ product reaching 20 million (19%) Indian farmers.**
- **Critical elements for further scaling-out:**
  - Improved insurance literacy
  - Engaging communities in products designing and MRV
  - Timely availability and accessibility of spatial and temporal weather data
  - Quick settlement of claims
- **Researchers, industry and government need to work together.**

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# To conclude:

- **Better preparedness**
  - Better understanding of climate
  - Forecast based planning and management (allocation of land, selection of crops, varieties and investments on inputs)
- **Better responses**
  - Planting primed seed/transplanting
  - Contingency plans
  - Water harvesting and Irrigation
- **Better recovery**
  - Safety nets/Insurance
  - Employment/migration
- **Developing good partnership to scale-up and achieve impact to benefit end-users**

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