Climate-smart agriculture
to face climate change and variability in West Africa
Climate variability & change: facts!

- 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
Length of growing season is likely to decline...

To 2090, taking 18 climate models

Four degree rise

Length of growing period (%)

How can farmers achieve food security under a variable and changing climate?

We need climate-smart agriculture actions at all levels!

1. sustainably increases **productivity** and enhances the achievement of national food security and development goals
2. Increases **resilience** (adaptation)
3. reduces **greenhouse gases** where possible
Farm and community: climate-smart practices, institutions

Climate-smart agriculture happens at multiple levels

Global: climate models, international agreements, finance

National and regional: enabling policies, extension, support, research, finance
Climate information for better planning and management in Senegal

Climate information (indigenous & scientific) help to improve planning and management of farms by smallholder farmers
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**
- **Seasonal forecast**
  - crop variety
  - varieties
- **Onset forecast**
  - farm preparation
  - optimum planting

**During cropping season**
- **Nowcasting**
  - flooding saving life (thunder)
- **Daily forecast**
  - use of fertilizer / pesticide
- **Ten-day forecast**
  - weeding, field work
- **Updating seasonal forecast**
  - second cropping

**Maturity/end season**
- **Ten-day forecast**
  - optimum harvesting period
  - rain during dry season

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**Diagram:**
- **Sowing**
- **Vegetative stage**
- **Reproductive stage**
- **Harvest**
Partnership for Senegal Early warning system

- Seasonal forecast
- Weather forecast
- Nowcasting

Local working Group (Issue EWS)

- Livestock
- Local authority
- Seed growers
- Farmers
- Rural radio
- Extensions services
- Forestry
- Agriculture
- Pest Disease Control

Stakeholders:
- Experts and decision makers
- Community

- Rural radio
- Text messaging
- Social gatherings
- Bulletin
- Red Cross
COMMUNICATION & COMMUNICATION partnership with union of rural radio (URAC)

Target: 3 million farmers
Climate information affects inputs use and farm productivity of cowpea and sesame sectors in Burkina Faso

Evaluation using With-and-Without Comparison
(i) 110 experimental farmers (11 villages) who are exposed to climate information
(ii) 60 controlled farmers (6 villages) who are not exposed to climate information.

<table>
<thead>
<tr>
<th></th>
<th>Cowpea</th>
<th>Sesame</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Exposed</td>
<td>Not exposed</td>
</tr>
<tr>
<td>Number of farmers</td>
<td>56</td>
<td>32</td>
</tr>
<tr>
<td>Local seed (kg/ha)</td>
<td>17</td>
<td>45</td>
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<tr>
<td>Improved seed (kg/ha)</td>
<td>7</td>
<td>1</td>
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<tr>
<td>Organic manure (kg/ha)</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>Fertilizers (kg/ha)</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Insecticides (l/ha)</td>
<td>2.45</td>
<td>3.03</td>
</tr>
<tr>
<td>Area (ha)</td>
<td>0.26</td>
<td>0.22</td>
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</table>

* Significant at 10%; ** significant at 5% level.
Climate information affects inputs use and farm productivity of cowpea and sesame sectors in Burkina Faso

Effect of climate information use on farm productivity

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<tbody>
<tr>
<td></td>
<td>Exposed</td>
<td>Not exposed</td>
<td>Difference</td>
<td>Exposed</td>
<td>Not exposed</td>
<td>Difference</td>
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<tr>
<td>Number of farmers</td>
<td>56</td>
<td>32</td>
<td>0.04</td>
<td>55</td>
<td>29</td>
<td>0.05</td>
</tr>
<tr>
<td>Area (ha)</td>
<td>0.26</td>
<td>0.22</td>
<td>0.04</td>
<td>0.34</td>
<td>0.29</td>
<td>0.05</td>
</tr>
<tr>
<td>Yield (kg/ha)</td>
<td>875</td>
<td>683</td>
<td>193*</td>
<td>544</td>
<td>568</td>
<td>-23.59</td>
</tr>
<tr>
<td>Gross product (F CFA /ha)</td>
<td>102 613</td>
<td>108 585</td>
<td>-5 973</td>
<td>416 986</td>
<td>495 258</td>
<td>-78 272</td>
</tr>
<tr>
<td>Cost of inputs (F CFA /ha)</td>
<td>40 169</td>
<td>55 669</td>
<td>-15 499</td>
<td>33 599</td>
<td>32 521</td>
<td>1 077</td>
</tr>
<tr>
<td>Gross margin (F CFA /ha)</td>
<td>62 443</td>
<td>52 916</td>
<td>9 527</td>
<td>383 387</td>
<td>462 395</td>
<td>-79 008</td>
</tr>
</tbody>
</table>

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Farmers exposed to climate information have changed their farm practices based on the information they received. Changes in agricultural inputs used increase farm productivity including yield and gross margin.
To conclude:

• Better preparedness
  ➢ Better climate science and 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