Identification and Assessment of Agricultural Practices and Technologies to Enhance Productivity in a Sustainable Manner, Food Security and Resilience, Considering the Differences in Agro-Ecological Zones and Farming Systems

Ch. Srinivasa Rao
ICAR-Central Research Institute for Dryland Agriculture
Hyderabad, India

director@crida.in; cherukumalli2011@gmail.com
1) **What experience does your country** have with the identification and assessment of agricultural practices and technologies to enhance productivity in a sustainable manner, food security and resilience?

2) **How do various processes under the Convention** facilitate the identification and assessment of agricultural practices and technologies to enhance productivity in a sustainable manner, food security and resilience observed in your country?

3) **What are the potential areas for synergies among various processes under the Convention** to facilitate the identification and assessment of agricultural practices and technologies to enhance productivity in a sustainable manner, food security and resilience in your country.
India

1.3 Billion + Indians

Marginal Lands

Declining Per Capita Land Availability

Socio-economic structure

Markets & Price

Climate Variability

Productivity vs Food Security

Climate Change

Droughts

Cyclones/Floods

Heat wave

Hail storms

Frost

India Food Security

Hunger Malnutrition

* 270 million tons +
* Imports of food legumes and edible oils
## Droughts and Extreme Climatic Events in India

<table>
<thead>
<tr>
<th>Year</th>
<th>Rainfall Departure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>-8</td>
</tr>
<tr>
<td>2001</td>
<td>-15</td>
</tr>
<tr>
<td>2002</td>
<td>-19</td>
</tr>
<tr>
<td>2003</td>
<td>+2</td>
</tr>
<tr>
<td>2004</td>
<td>-13</td>
</tr>
<tr>
<td>2005</td>
<td>-1</td>
</tr>
<tr>
<td>2006</td>
<td>-1</td>
</tr>
<tr>
<td>2007</td>
<td>+5</td>
</tr>
<tr>
<td>2008</td>
<td>-2</td>
</tr>
<tr>
<td>2009</td>
<td>-23</td>
</tr>
<tr>
<td>2010</td>
<td>+2</td>
</tr>
<tr>
<td>2011</td>
<td>+1</td>
</tr>
<tr>
<td>2012</td>
<td>-8</td>
</tr>
<tr>
<td>2014</td>
<td>-12</td>
</tr>
<tr>
<td>2015</td>
<td>-14</td>
</tr>
</tbody>
</table>
Rainfed Agriculture in India: High Vulnerable to CC

- Net rainfed area in India - 74 mha (53% of net sown area)
- 40% to national food basket
- Practiced by 80% of small and marginal farmers
- Nearly 40% of the net sown area in India will remain rainfed after full irrigation potential
- Average productivity – 1.2 t/ha

**Major Challenges:**
- Edaphic constraints (poor soil quality, low organic carbon)
- Bridging yield gaps
- Climate change & multiple climate risks
- Poor socio economic background
- Weak infrastructure

**Practices/Technologies**
- Efficient rain water management
- Promotion of stress tolerant crop cultivars and systems
- Conservation agriculture and integration of resource conservation technologies
- Location specific and farm pond based IFS systems
- Managing weather aberrations – both preparedness and real time contingency plan implementation
- Use of geospatial and ICTs for drought monitoring and coping, agro-advisories, weather insurance
- Innovations in technology transfer
SBSTA Convention

- Vulnerability of Agriculture systems to drought, flood, cyclone, heat wave, hail, sea water intrusion

- Programs on agriculture sectors are linked with vulnerability agro eco zones

- 614/651 districts targeted are ready with District Agriculture Contingency Plans.

- Implementation in accordance with monsoon forecast

- SAARC countries – Contingency Template
Successful Demonstration of Contingency Crop to Manage Mid Season Drought in RR Dist

Regular kharif crops in drought-2015

Maize  Cotton  Rice  Tomato

Contingency crop, Horsegram (CRHG-4 & CRHG-18R), 90-95 days

Severe wilting and poor yields (Sowing: 6-15 June, 2015)
India

Actions under various Processes under Convention

- PMKSY (More crop per drop; Efficient water systems)
- NMSA (Sustainable Rainfed Ecosystems)
- Dryland Missions of States (Sub National: Programs)
- District Agriculture Contingency Plans - 614 (Adaptation)
- Expanding climate adaptive villages (Village to Clusters)
- NHM (Micro/pressurized irrigation systems)
- MGNREGA (Soil erosion, water harvesting, resource conservation)
- RKVY (Contingency crops and seed supply, NRM interventions)
- PM Crop Insurance Plan (Crop insurance)
- Soil Health Program (Soil carbon improvement)
- NICRA Program: Adaptive Agriculture R and D
- 700 KVKs: Agriculture Knowledge Centers
- National Disaster Management/State level units
lentil

In-situ rainwater harvest

Runoff water in Farm Ponds

Legumes in Intercrops

Cover crops with off season rainfall

Agro-advisories

Tolerant breed

Fodder security

Poultry systems

India
1) Implementation of Contingency Plans as adaptation mechanism – under National adaptation fund and GCF opportunities.
2) Contingency Template developed for SAARC countries (Convergence)
3) Strengthening monsoon forecasting, establishing automatic weather stations, down sizing agro advisories (Technology needs)
4) Agriculture Insurance expansion (Financial support needs)
5) ITKs and Tribal regions and Integrated farming systems
6) National Agro-forestry policy
7) SBI-SBSTA-NAP-National Programs, Regional Action Plans
8) Strategic research in climate change (multiple stress tolerant cultivars, breeds)
9) Local germplasm utilization (under convention)
10) Local/village level institutions like village climate adaptation committee and communication
11) Capacity building for Agriculture Adaptation
Climate Research Infrastructure—Established

FATE Facility—Evaluation of Pigeon pea

Evaluation of pigeon pea and groundnut crops in CTGC facility
Thank You