Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa
Country perspectives on prospects and constraints to adoption of SIMLESA technical and institutional innovations in high and low potential areas

MOZAMBIQUE
**SITES IN MOZAMBIQUE (MORE THAN 70 NEW COMM.)**

**Site Map & Communities (2010/18):**

**Tete-Angonia (R10)-Ciphole & Cabanco**, Domue, Chikudu, Nsendeza, Chabuni, Nchenga, Dzatumbe e Kalinthulo, Bivi and 11 more..
- Avg altitude: 1270 masl
- Rainfall: 1200 mm

**Manica-Manica (R10, &R4) – Chinhamdombwe**, Mavonde, Vanduzi, Macadera, Pina, Messica and >
- Avg altitude: 723 masl
- Rainfall: 1014 mm

**Sofala-Gorongosa (R4) – Canda-sede**, Metochira, Tica, Nhamatanda.
- Avg. altitude: 450 masl

**Manica-Sussundenga (R4), Rotanda (R10), Munhinga**, Muoha, Munhinga, Marera; Altitude: 635 masl
- Rainfall: 1100 mm
Characterized farming systems and established benchmarks for adoption and impact assessment by objective 1 team-2010

- 70 communities characterized
- 2 agro-ecologies identified
- 510 households (348 male and 162 female) surveyed to generate data on adoption, production, market, risk management strategies, etc.
Some opportunities

• extension services and Local community leadership
• small private sector (agricultural input dealers)
• community radios and mobile phones
• Available market for maize & soybean (poultry and food processing companies)
• Enabling policy (seed, fertilizers) for agricultural development
Major production constraints:

• Increased market risk
• Lack of market information to the farmers
• Drudgery due to low mechanization
• Poor organization of innovative institutions (AIPs)
• Low adoption of improved varieties:
• Climate change and seasonal variability
Approaches used for addressing the constraints (R&D):

- **Testing of promising best bet CA technologies** for different agro-ecologies: 36 exploratory trials (18 in high potential areas and 18 in low potential areas) from 2011-2018 (R)

- **Testing improved maize and legume varieties**: M&B trials, legume trials and PVS and On-station trials (long term, Weed & termite control, intensification trials established for in-depth studies of CA effects) (R).

- **Strengthening** of IPs (IDEAA-CA, ADEM, AGRIMERC and UCAMA) (D)

- Capacity building (2 MSc and 1 PhD and many in situ and short term trainings) (D)

**Use of ICT**: SMS system established for technological information dissemination
## Legume On-farm Trials 2011-14 (R)

<table>
<thead>
<tr>
<th>Legume</th>
<th># Trials Planted</th>
<th># Trials harvested</th>
<th># Varieties</th>
<th># Sites</th>
<th># Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soya beans</td>
<td>219</td>
<td>202</td>
<td>32</td>
<td>22</td>
<td>219</td>
</tr>
<tr>
<td>Cowpea</td>
<td>208</td>
<td>198</td>
<td>16</td>
<td>24</td>
<td>208</td>
</tr>
<tr>
<td>Pigeon pea</td>
<td>136</td>
<td>126</td>
<td>8</td>
<td>14</td>
<td>136</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>563</strong></td>
<td><strong>526</strong></td>
<td><strong>56</strong></td>
<td><strong>60</strong></td>
<td><strong>563</strong></td>
</tr>
</tbody>
</table>
## Maize Mother & Baby Trials 2012-14 (R)

<table>
<thead>
<tr>
<th>Maize trials</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Total</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers</td>
<td>16</td>
<td>24</td>
<td>24</td>
<td>64</td>
<td>32</td>
</tr>
<tr>
<td>Babies</td>
<td>54</td>
<td>72</td>
<td>102</td>
<td>228</td>
<td>38</td>
</tr>
<tr>
<td>Demos</td>
<td>0</td>
<td>24</td>
<td>24</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Farmers</td>
<td>62</td>
<td>108</td>
<td>138</td>
<td>308</td>
<td></td>
</tr>
</tbody>
</table>

**Mother trial:** Macate 2012

**Mother trial:** Macate 2013
Technology package generated, promoted and adopted

• Correct use of fertilizers and rates (APSIM)

• Increased use of IIAM technologies (Legume and maize) eg CA maize-cowpea and maize-soya rotations/intercrops, maize-pigeon-pea systems, herbicides.

• Use of components of CA (Outscaled by ISPM, UCAMA and AGRIMERC through CGS scheme),

• Introduced proper crop management
Developed improved CA techniques capable of handling waterlogged conditions in Angonia (R10, data of 3 seasons available).

<table>
<thead>
<tr>
<th>Main Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 m</td>
</tr>
<tr>
<td>12m</td>
</tr>
<tr>
<td>Ridges /furrows oriented in farmers way</td>
</tr>
</tbody>
</table>

- **Conventional Maize Ridge/furrow Farmer practice** (farmer’s check)
- **Improved Graded ridges & furrows**
  - Gradient 1:200
  - Direction of crop rows
- **CA-Raised beds**
  - Gradient 1:200
- **CA-raised beds and cross ties**
  - Gradient 1:200
  - Cross ties placed 2 m intervals along furrows
APPSA-World Bank is further testing improved raised bed technology (R):
Adoption of Sustainable Agricultural Practices by district

n = 400 hh

- Geography matters
- Angónia: fertilizer and intercropping, soil bounds
- Sussundenga: Mulching, minimum tillage
- SIMLESA: More targeting of SAIPs by district may increase adoption

**Manica**

**Susundenga**

**Angonia**

- Crop residue on the farm
- Improved maize variety
- Inorganic fertilizer
- Maize legume intercropping
- Mulching
- Maize legume rotation
- Minimum tillage excluding one plow
- Soil bunds
- Terraces
- Trees on boundaries
- Mechanized
Adoption of SAIPs by gender

- Gender matters
- Male: improved varieties, and fertilizer
- Female: intercropping, mulching, rotations
- SIMLESA: More targeting of SAIPs by gender may increase adoption

n = 400 hh

## Number of beneficiaries reached through different methods/approaches by CGS partners (2018 season)

<table>
<thead>
<tr>
<th>Scaling out strategy (Tete, Sofala and Manica)</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainings</td>
<td>8974</td>
<td>6081</td>
<td>15055</td>
</tr>
<tr>
<td>Field Days</td>
<td>3016</td>
<td>2446</td>
<td>5462</td>
</tr>
<tr>
<td>Exchange visits</td>
<td>8</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Demo plots</td>
<td>511</td>
<td>228</td>
<td>739</td>
</tr>
<tr>
<td>sms</td>
<td>2696</td>
<td>1066</td>
<td>3762</td>
</tr>
</tbody>
</table>
Both are in alignment with new regional initiatives, namely the Comprehensive African Agriculture Development Programme (CAADP)

PEDSA of Mozambique has 4 pillars for Agricultural Development:

PILAR 1. Agricultural production and productivity and its competitiveness increased.
Result 1.7 Increased agricultural mechanization and the use of efficient technologies

- bullet 1 deals with mechanization incentives for private sector...etc...
- bullet two says: expand CA to reduce drudgery, recover degraded soils, manage water including good production packages and IPM.

- Other supportive policies: Irrigation strategy, Gender in agriculture, Fertilizer and seed strategy, and many others!
Then why slow adoption of technologies?

- High input costs (seeds and agrochemicals) for the most poor farmers vs low cost of produce (maize prices extremely low = 0.083 USD/kg)

- Lack of reliable market for new seed varieties and basic CA equipment and herbicides (2 SIMLESA farmers became agrodealers)

- Drudgery (will be reduced if initiatives such as of APPSA-MEC is successful)

- Production risks and uncertainty due to dryspells, flood, diseases and pests such as fall arm worm outbreak) and,

- Competition of crop residues with residues, firewoods and livestock (Angonia) and many projects, # agenda confusing extension agents and farmers!
Why SIMLESA is different from other projects?

• Public Private/NGOs/Associations Partnership approach in scaling out technologies and using new scaling out strategies

• socially inclusive - value chain for policy discussion in Kampala - Australian and American universities

• Empowering local NARs to implement and manage project outputs and share experiences with organizations elsewhere (ex. EMBRAPA)

• Capacity building - (farmers exchange visit, researchers and extension)
Defining the future

• More synthesis of results for informing policy required

• Production of dissemination materials

• Develop diverse mechanization options (animal traction, 2 and 4 wheel tractors)

• Input access modalities and markets

• Policy engagement
Thank you for your interest!