Pulses: solutions to human health and cropping systems sustainability
2016 INTERNATIONAL YEAR OF PULSES

nutritious seeds for a sustainable future

fao.org/pulses-2016 | pulses-2016@fao.org | #IYP2016
Pulses are grown in climate ranging from tropics to temperate.
Why Pulses?

Improved food security

Improved livelihood

Improved nutrition & health

Sustain natural resources

A Bangladeshi mother is feeding rice and lentil dal to her children.
Pulses are climate smart crops with less water requirements

Water efficiency in food production (measured in galleons per ton)

<table>
<thead>
<tr>
<th></th>
<th>Pulses</th>
<th>Eggs</th>
<th>Chicken</th>
<th>Pork</th>
<th>Beef</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daal (1kg)</td>
<td>2,500</td>
<td>3,200</td>
<td>4,500</td>
<td>5,900</td>
<td>20,700</td>
</tr>
<tr>
<td></td>
<td>1250 liters</td>
<td>4325 liters</td>
<td>5520 liters</td>
<td>13000 liters</td>
<td></td>
</tr>
</tbody>
</table>
Yield of all pulses in different countries, 2011-13

- There is large inter-regional and inter-country yield variation
- Average yields of developed countries was > 1.2 t/ha
  - Canada > 2 t/ha; US near 2 t/ha
- Developing countries average yield was <1 t/ha
  - Myanmar and Ethiopia are exception
  - Most of the African and S Asian countries yields are < 500 kg/ha

Source: P.K. Joshi, IFPRI
Climatic regions suitable for pulses in Australia

Knights and Siddique, 2003
Chickpea - the No. 1 Pulse in Australia

Ascochyta blight

0.6 MHa

Australia
Chick peas
Area harvested

M = Million, K = Thousand
Global pulse trade: about 12 million tons

- North America: +4.9
- Europe: +0.2
- Latin America and the Caribbean: -0.5
- Sub-Saharan Africa: +0.1
- South Asia: -4.5
- WANA Region: -1.7
- Oceania: +1.3

Sources: FAOSTAT (2011)
Growing importance of pulses in many countries - especially more vulnerable population

Share of pulse area in arable land (%)
Pigeon pea success story in Eastern and Southern Africa

Source: Dr Ganga Rao
Pigeon pea Production (‘000 t) trends

Asia
Africa
Carribean
## Pigeon pea growth trends in Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>In ‘000 t</th>
<th>% increase</th>
<th>Production</th>
<th>Area</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>87.1</td>
<td>249.3</td>
<td>186</td>
<td>106</td>
<td>39</td>
</tr>
<tr>
<td>Mozambique</td>
<td>31.6</td>
<td>120.9</td>
<td>282</td>
<td>261</td>
<td>6</td>
</tr>
<tr>
<td>Malawi</td>
<td>105.8</td>
<td>301.0</td>
<td>184</td>
<td>69</td>
<td>68</td>
</tr>
<tr>
<td>Kenya</td>
<td>73.46</td>
<td>274.5</td>
<td>274</td>
<td>68</td>
<td>122</td>
</tr>
<tr>
<td>Uganda</td>
<td>80.0</td>
<td>93.6</td>
<td>17</td>
<td>28</td>
<td>-8</td>
</tr>
<tr>
<td><strong>Africa</strong></td>
<td><strong>380.6</strong></td>
<td><strong>1047.3</strong></td>
<td><strong>175</strong></td>
<td><strong>96</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>
# Pigeon pea Exports from Africa (000’ t)

India imports about 570,000 t annually

50% from Myanmar and 50% from Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>5 year range</th>
<th>2016 (expected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>75-90</td>
<td>70</td>
</tr>
<tr>
<td>Mozambique</td>
<td>55-75</td>
<td>75</td>
</tr>
<tr>
<td>Malawi</td>
<td>60-90</td>
<td>70</td>
</tr>
<tr>
<td>Kenya</td>
<td>15-20</td>
<td>18</td>
</tr>
<tr>
<td>Uganda</td>
<td>8-14</td>
<td>12</td>
</tr>
<tr>
<td>Sudan</td>
<td>40-50</td>
<td>45</td>
</tr>
<tr>
<td>Africa</td>
<td>253-339</td>
<td>290</td>
</tr>
</tbody>
</table>

Source: Jayesh Patel 2016, ETG
Pigeon pea Drivers of Success

- High yielding, wilt resistant MD varieties
- SI through ICM with women participation
- Regional and international export and participation of large traders
- Innovative seed systems in partnership with local farmers, NGOs and Government
- Value addition and then export to regional and international markets
- Very strong participation of partners, donors (BMGF, USAID, Irish Aid etc.,) Governments initiatives -Kilimo Kwanza, Input subsidy
Global investment in pulse R,D&E is too low compared with cereal crops: (US $ 175 million per annum in 13 pulse crops)

Neglecting legumes has compromised human health and sustainable food production

Christine H. Foyer¹,²*, Hon-Ming Lam³, Henry T. Nguyen⁴, Kadambot H. M. Siddique⁵, Rajeev Varshney⁶, Timothy D. Colmer²,⁵, Wallace Cowling⁵, Helen Bramley⁷, Trevor A. Mori⁸, Jonathan M. Hodgson⁸, James W. Cooper¹, Anthony J. Miller⁹, Karl Kunert¹⁰, Juan Vorster¹⁰, Christopher Cullis¹¹, Jocelyn A. Ozga¹², Mark L. Wahlqvist¹³,¹⁴, Yan Liang¹⁵, Huixia Shou¹⁶, Kai Shi¹⁷, Jingquan Yu¹⁷, Nandor Fodor¹, Brent N. Kaiser¹⁸, Fuk-Ling Wong³, Babu Valliyodan⁵ and Michael J. Considine²,⁵,¹⁹
Conclusions and way forward

• Demand for pulses is growing but supply constraints will lead to rise in prices and increase trade

• Pulses production and trade scenario in changing
  – New countries producing pulses and exporting to deficit countries

• Global level
  – Increase funding for pulse R,D&E
  – Incentives for improved technologies to public as well as private sector
  – Effective trade

• National level
  – Bridge yield gaps to increase domestic production
  – Improve pulse value chains to benefit producers and consumers
  – Attract private sector in pulses production, processing and marketing
  – Promote innovative institutions for scale