Farmer Participatory Seed Production Models in India

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Pulses in India

- Used as food or feed
- Prominent source of protein
- Enhance soil productivity
- Grown as rainfed crop on 23 m ha
- Low mean yield (565 kg/ha)
- India produces 12-14 m t of pulses annually (28% of global value)
<table>
<thead>
<tr>
<th>Period</th>
<th>Area m ha</th>
<th>Prodn m t</th>
<th>Yield kg/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE 1975</td>
<td>24</td>
<td>12</td>
<td>500</td>
</tr>
<tr>
<td>TE 1985</td>
<td>24</td>
<td>13</td>
<td>550</td>
</tr>
<tr>
<td>TE 1995</td>
<td>23</td>
<td>13</td>
<td>565</td>
</tr>
<tr>
<td>TE 2005</td>
<td>23</td>
<td>13</td>
<td>565</td>
</tr>
</tbody>
</table>
In the Wave of Green Revolution
THE PULSES WERE NEGELECTED

Production increment for
Pulses = 32% ;  Cereals = 280%
Pulses had 0.9% growth / 50 yrs

Protein availability reduced to
< 10 g Protein / Person / Day
Production of Pulses

- **CHICKPEA**
  - 40% (65% of global production)
  - Pigeon pea
  - 18% (72% of global production)
- **Pigeon pea**
- **Mung bean**
  - 8%
- **Black gram**
  - 10%
- **Lentil**
  - 6%
- **Pea**
  - 4%
- **Others**
  - 14%
HIGH SEED QUALITY IS THE KEY OF SUCCESS
SEEDS

Contain Genetic Information

therefore

Genetic Purity and Quantity of Seed are Important
Delivering seeds to farmers

- Informal seed sector
- Formal seed sector
- Integrated seed supply
Framework of Formal Seed System

National

Gov. seed agencies, Uni., Research Institutes, Seed Companies

Multinational Dev. Agencies, Bi-lateral, Seed Companies

International

IARC

Informal Seed Sector: Coop, Farmers’ Org, NGOs, Govt. Org, Farmers
INFORMAL Seed System

- Serves 70% of country’s need
- Based on savings of local varieties
- The processes are: directly use, share, exchange, barter, and sale
- Location-specific
- Seed may be used for 3-4 years
Informal System (contd)

Farmers’ participatory

- Lack of specialization
- Heterogeneous & flexible
- Traditional
- Operating at community level
- Sometimes use exchange
- Limited seed / transaction
The most popular seed grade in pulses is Truthfully Labelled (TL) Seed.

Contract growers produce varieties and maintain genetic purity.
FARMERS’ PARTICIPATORY SEED PRODUCTION MODELS

1. Community based seed model
2. PDKV Seed System model
Comm.-based Seed Model

INSTITUTE

FARMERS, NGOs, SHGs

Quality seed prod vil. level; safe storage of seed

CROP MONITORING & QUALITY CONTROL

SEED DISPOSAL
PDKV Seed System Model

Seed source of a new cultivar

Obtain 2 kg good quality seed

2 kg seed from selected plants to start second Stage-I cycle

I stg II stage III stage

Stage-I seed plot 0.01 ha
Stage-II seed plot 0.10 ha
Stage-III commercial plot 1 ha

MARKETING
Integrated System

- Promotion of new varieties
  - Integrate breeding, seed prod. & distribution
  - Farmers involved at some stages
  - Seed supply to small farmers.
- Shown promise

ICRISAT Science with a human face
Limitations of informal pulses seed system

- Regulatory and legal framework adversely affect the plans
- Seed standards may be incompatible with farmers’ efforts
- Seeds used for sowing come may of sub-standards
- During crop failures, the seed supplied by the Government, may be insufficient in qty
Limitations to Community Seed System

- Poor infrastructure in rural areas
- Shortage of seed & other resources
- Lack of awareness for new tech.
- Poor assessment of potential adoption of new varieties
- Inadequate participation of farmers
- Weak local seed exchange networks
Limitations to Community Seed System (contd)

- Farmers’ low preference to pulses (low profitability)
- Inadequate cropping systems
- Inadequate institutional support
- Inadequate farmers’ participation
- Exploitation by middlemen
Socio-economic Constraints

• A large number of varieties are grown, their unscientific distribution leads to poor adoption
• Lack of national policy for production, import & export is necessary
• Uncertainty over support price
• Inadequate research thrust on pulses
Constraints to Pulses Seed Production

- Losses due to pests 2.5 m t /year
- Losses due to drought in >87% area
- Losses due to poor drainage
- Post-harvest losses are 9.5%.
  
  Storage (7.5%),  Processing (1%),
  Threshing (0.5%),  Transport (0.5%).
## Growth in Certified Seed Production (t)

<table>
<thead>
<tr>
<th>Crop</th>
<th>2002-03</th>
<th>2008-09</th>
<th>Increase%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickpea</td>
<td>24,500</td>
<td>83,500</td>
<td>70.66</td>
</tr>
<tr>
<td>Black gram</td>
<td>13,400</td>
<td>31,400</td>
<td>57.32</td>
</tr>
<tr>
<td>Mung bean</td>
<td>9,600</td>
<td>24,800</td>
<td>61.29</td>
</tr>
<tr>
<td>Pigeonpea</td>
<td>8,600</td>
<td>17,500</td>
<td>50.86</td>
</tr>
<tr>
<td>Others</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>TOTAL</td>
<td>64,600</td>
<td>183,100</td>
<td>64.72</td>
</tr>
<tr>
<td>Breeder</td>
<td>600 t</td>
<td>900 t (07-08)</td>
<td>33.33</td>
</tr>
</tbody>
</table>
## Shortage of Pulses Seed

<table>
<thead>
<tr>
<th>Crop</th>
<th>Seed prod. 2008 (t)</th>
<th>Area sown 2009 (m ha)</th>
<th>Required seeds (t)</th>
<th>Shortage in 2009 (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickpea</td>
<td>83,500</td>
<td>11.29</td>
<td>169,350</td>
<td>85,850</td>
</tr>
<tr>
<td>Blk gram</td>
<td>31,400</td>
<td>1.92</td>
<td>38,400</td>
<td>7,000</td>
</tr>
<tr>
<td>Mng bean</td>
<td>24,800</td>
<td>1.96</td>
<td>39,200</td>
<td>14,400</td>
</tr>
<tr>
<td>Pigeonpea</td>
<td>17,500</td>
<td>3.90</td>
<td>39,000</td>
<td>21,500</td>
</tr>
<tr>
<td>Lentil</td>
<td>5,900</td>
<td>2.21</td>
<td>88,400</td>
<td>82,500</td>
</tr>
<tr>
<td>Others</td>
<td>7,000</td>
<td>2.26</td>
<td>67,800</td>
<td>60,800</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>183,100</strong></td>
<td><strong>24.54</strong></td>
<td><strong>462,150</strong></td>
<td><strong>279,050 t</strong></td>
</tr>
</tbody>
</table>
Improving Farmers’ Participatory Seed Systems

- Develop strategies to produce & market pulses
- Enhance backup institutional support
- Introduce crop insurance schemes
- Agreement between farmers & seed agencies
- Help farmers in adoption of new tech.
- Develop specific seed models based on geographic and ethnic considerations
- Implement self-reliance seed programs to decentralize seed business

Example ‘Beej Swavlamban Yojana’
Interventions (contd)

• Promote farmer preferred var.
• Encourage seed companies
• Encourage Corporate Houses to support pulses seed programs
• Strengthen capacity of SHG
• Incentive to participating farmers
• Dev quality seed backup prog.
Seed Required By 2025

**Chickpea seed**
- Breeder = 448,720 kg
- Foundation = 5,983,830 kg
- Certified = 74,800 t

**Pigeonpea seed**
- Breeder = 4,940 kg
- Foundation = 220,100 kg
- Certified = 9,174 t

Diversify & Simplify The systems

ARE WE READY??
Thank you for your attention