Government of India’s Perspective and Initiatives on Integration of Future Smart Food in Rice-Fallows

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Rice Fallow Areas in India

• India accounts for 79% (11.65 million ha) of the total rice fallows of South-Asia (15.0 million ha) (NAAS, 2013)

• Rice fallows are widely distributed in rainfed eco-system of Eastern, Central and Peninsular India, besides the North-Eastern Hill region

• Rice fallows are spread mainly in the states of Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, West Bengal and Uttar Pradesh

• The Coastal Regions of Andhra Pradesh, Karnataka and Tamil Nadu form an important rice fallow ecology in Peninsular India
**Rice Fallows in India (11.65 million ha)**

**Eastern Region**: 4.27 m ha
Eastern U.P., Bihar, Jharkhand and West Bengal

**North-east Hill Region**: 0.54 m ha
Assam

**Central Region**: 5.01 m ha
Madhya Pradesh, Chhattisgarh, Maharashtra

**Coastal region**: 1.52 m ha
Andhra Pradesh, Odisha, Tamil Nadu
## Estimated Area under Rice Fallows in India

<table>
<thead>
<tr>
<th>State</th>
<th>Kharif rice area (m ha)</th>
<th>Rabi fallow (m ha)</th>
<th>Rice fallow as % of kharif rice areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP + Chhattisgarh</td>
<td>5.60</td>
<td>4.38</td>
<td>78.21</td>
</tr>
<tr>
<td>Bihar + Jharkhand</td>
<td>5.97</td>
<td>2.20</td>
<td>36.85</td>
</tr>
<tr>
<td>West Bengal</td>
<td>4.62</td>
<td>1.72</td>
<td>37.23</td>
</tr>
<tr>
<td>Odisha</td>
<td>3.88</td>
<td>1.22</td>
<td>31.44</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>1.76</td>
<td>0.63</td>
<td>35.80</td>
</tr>
<tr>
<td>Assam</td>
<td>2.23</td>
<td>0.54</td>
<td>24.22</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>6.62</td>
<td>0.35</td>
<td>5.29</td>
</tr>
<tr>
<td>Andra Pradesh</td>
<td>2.66</td>
<td>0.31</td>
<td>11.65</td>
</tr>
<tr>
<td>Others</td>
<td>7.20</td>
<td>0.30</td>
<td>4.17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40.18</strong></td>
<td><strong>11.65</strong></td>
<td><strong>29.00</strong></td>
</tr>
</tbody>
</table>

## Potential Crops for Rice Fallows in Different States

<table>
<thead>
<tr>
<th>Crop</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lentil</td>
<td>Assam, West Bengal, Bihar, Odisha, Eastern Uttar Pradesh, Chhattisgarh and Jharkhand</td>
</tr>
<tr>
<td>Pea</td>
<td>Jharkhand, Chhattisgarh, Eastern Uttar Pradesh and Northern Madhya Pradesh</td>
</tr>
<tr>
<td>Chickpea</td>
<td>Chhattisgarh, Bihar and Jharkhand</td>
</tr>
<tr>
<td>Green gram</td>
<td>Odisha, Chhattisgarh, Jharkhand, Bihar, Andhra Pradesh, Tamil Nadu and Karnataka</td>
</tr>
<tr>
<td>Black gram</td>
<td>Coastal Andhra Pradesh, Tamil Nadu, Karnataka and Odisha</td>
</tr>
<tr>
<td>Crop</td>
<td>State</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Grass pea (Lathyrus)</td>
<td>Tal area of Bihar, Chhattisgarh and West Bengal</td>
</tr>
<tr>
<td>Cluster bean</td>
<td>Andhra Pradesh, Tamil Nadu and Karnataka</td>
</tr>
<tr>
<td>Lablab bean</td>
<td>Andhra Pradesh, Tamil Nadu and Karnataka</td>
</tr>
<tr>
<td>Mustard</td>
<td>Eastern Uttar Pradesh, Bihar and Jharkhand</td>
</tr>
<tr>
<td>Sesame/Linseed</td>
<td>Odisha, Chhattisgarh, West Bengal, Jharkhand</td>
</tr>
<tr>
<td>Groundnut</td>
<td>Char area of Bihar, Mahananda of Odisha, Brahmaputra valley of Assam and coastal Andhra Pradesh</td>
</tr>
</tbody>
</table>

Source: NAAS Policy Paper 64 (2013)
How to Utilize Rice Fallows

- Use of short duration rice varieties during kharif.
- Selection of appropriate crops/varieties
- Introduction of short duration/water efficient genotypes
- Area specific Refinement of Package of Practices
- Introduction of water efficient genotypes
- Enhancing seed germination/seed treatment
- Pelleting of seeds
- Use of Utera System (Relay Cropping)
- Foliar application of nutrients
- Timely plant protection
- Providing life saving irrigation through sprinklers
- Special initiatives by the Governments
Initiatives Taken by Government of India

- Mapping of potential districts for cultivation of oilseeds and pulses
- Creation of water harvesting structure, supply of sprinklers for live saving irrigation, water carrying pipes
- Supply of seed minikits for pulses and oilseeds to promote new high yielding varieties.
- Creation of seed hubs by ICAR-KVKs
- Cluster demonstrations on oilseeds and pulses in selected districts and villages for a continuous period of three years.
- Coordination and collaboration with International organizations for developing varieties/technologies.
- A scheme has been launched in rabi 2016-17 for targeting 30 lakh ha of rice fallow under oilseeds and pulses by next three years
Targeting Rice Fallow Areas in Eastern India

- DAC&FW is implementing a sub-scheme under Rashtriya Krishi Vigyan Yojana (RKVY) – “Targeting Rice Fallow Areas” in Eastern India since rabi season 2016-17.
- The implementing states are:
  - Assam, Bihar, Chhattisgarh, Jharkhand, Odisha and West Bengal with a total fund of Rs. 75.00 crore.
- Potential area: above 57.00 lakh ha
- Target area: 30.00 lakh ha in 3 years.
- An area of 19.00 lakh ha has been covered during rabi/summer in these states.
Mapping Rice Fallow Areas in India

- In India efforts on mapping of rice fallow areas in some Eastern States using remote sensing technique has been attempted through Mahalanobis Crop Forecasting Centre, New Delhi.

- The centre has applied remote sensing data with ground validation survey to identify rice fallow areas in Odisha, Chhattisgarh and other states.
Approach for Suitability Analysis

**Logical Model**

- Post Kharif Rice (Rabi Cropped)
- Post Kharif Rice (Rabi fallow)
- Kharif Rice Map 2015-16 (RISAT-1)

**Criteria:**
- Mean monthly air temp $> 18^\circ C \leq 24^\circ C$
- LSWI January 2016 $> 0.1$
- PAWC $> 75$ cm

**Required parameters for Pulses cultivation**
- Rainfall: 800 mm per year
- Soil Texture: sandy soil to heavy black soil.
- pH range: 6.0 to 6.8.
- Heavier soils with more water retention
- Soil should be well drained particularly in rainy season.

Area favourable for *rabi* crop sowing

Post Kharif rice fallow area suitable for *rabi* crop growing
Suitability Analysis for Rabi Crops

Baleshwar District (Odisha)

Mayurbhanj District (Odisha)

Raipur District (Chhattisgarh)

Sarguja District (Chhattisgarh)
Conclusions and Way Forward

- Mapping of potential zone through remote sensing
- Enabling policy- integrating market, MSP, buffer stock, warehousing.
- Cropping system approach including intercropping
- Community water reservoirs
- Promotion of Farm implements/tools.
- Ensuring timely availability of critical inputs
- Strong seed production chain
- Facilitating Rural credit
- Protection from stray cattle/wild animals
- Consolidation of R&D activities for future roadmap
- Capacity building and awareness to the farmers.
Thank You