Promoting Regional Cooperation for improved national seed systems:

Updates on seed sharing policy for SE Asia

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Outline

• Need for new varieties
• Advances through recent developments
• Criteria for release
• Initiatives in South Asia
• Developments in Siem Reap, Cambodia
GLOBAL RICE DEMAND

Million tons milled rice

Additional rice needed: 116m tons by 2035

2010 global rice production

Source: IRRI Global Rice Model
Available land is diminishing

Per capita arable land (ha/person)

Data source: FAOSTAT (2013)
Keeping up with demand: more food with less resources

• **Favorable areas are approaching limits**
  – Effective breeding programs for higher genetic gains
  – Faster varietal replacement
  – Efficient production options

• **Unfavorable areas are extensive across SE Asia**
  – Half of global rice area, but low productivity
  – Opportunities to meet future needs
  – A second green revolution
Impact in farmers’ fields

Flood

Ciherang-Sub1

Drought

Sahbhagi dhan

BINA dhan 8

Salt
What else stress tolerant varieties deliver:

- **Stress tolerant varieties bringing:**
  - Production stability: social changes
  - Benefits to marginal and resource-poor farmers

- **Profitable systems: Shorter maturing STVs provide opportunities for multiple crops => food and nutrition**

- **Farmers accessing STVs use:**
  - More inputs
  - Shift from cheap and less effective technologies
  - Increased use of agricultural credit
  - Ready to diversify their crops and income sources

- **Set for a second green revolution?**
Variety Development & Release

• Continued development of varieties needed for food security, poverty alleviation, & adaptation to climate change

• Timely & easy access to new improved varieties allows farmers / society to fully benefit

• National variety release systems differ according to the level of seed market development & regulations

• Many countries are developing plant variety protection guidelines as part of international commitments

• Technological advances are allowing faster variety development
Reaching the farms requires good policies and guidelines

• Faster release & commercialization of new varieties to replace older varieties and landraces

• Proper certification systems

• Support for private sector involvement

• Knowledge and learning within and across regions shared and trusted

• Moving varieties and seeds across borders for faster benefits
Usual Criteria for Releasing Varieties

• Yield potential: Yield & components
• Maturity: Very early, early, medium/late
• Yield Stability: Wide adaptation or location-specific
• Agronomic traits: Culm & panicle lengths, tillers
• Disease resistance: Blast, bacterial blight, virus etc.
• Insect resistance: Planthopper, borers etc.
• Abiotic stress tolerance: Drought, salinity, etc
• Grain/Eating quality: Translucency, chalkiness, amylose content, palatability
• Milling properties: Milling & head rice recovery
• and others:
Key sections of the guidelines

1. **Purpose** – enumerates the objectives of having a set of streamlined, generic guidelines
2. **Terminologies** – defines commonly used words and phrases to set a universal understanding and use of terminologies.
3. **Coverage** – rice varieties covered under the guidelines
4. **General prerequisites for release** – general conditions, requirements, and restrictions before seeds are released
5. **Basic eligibility requirements for registration** – lists characteristics of a variety such as safety, purity, uniqueness, and sufficient documentation
6. **Confidential business information (CBI)** – states that a privately developed hybrid may be waived
7. **Standing committees** – functions and authority of the Varietal Release Committee
8. **Formal and structured release** – describes and lists the required elements for multi-stage and multi-location testing procedures
9. **Special releases** – a list of information required for disclosure if the variety is determined to have an economically important trait or gene
10. **Special release procedures** – a step-by-step guide and the requirements for petitioning a variety for special release
11. **Agro-ecological-specific releases** – a set of conditions if a variety is considered to have exceptional performance in certain agro-ecological areas
12. **Cancellation, suspension, and change of registration** – procedures to follow if a variety is found to be identical to a previously registered variety

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http://irri.org/knowledge/seeds
Varietal release and INGER in South-East Asia

Number of nurseries dispatched between 1990-2017

Number of varieties released in SE Asia since 1990. Total 457++

IRRI INGER & MET Team
## Outputs: released stress-tolerant varieties (as of September 2013)

<table>
<thead>
<tr>
<th>Country</th>
<th>Drought (14)</th>
<th>Submergence (21)</th>
<th>Salinity (30)</th>
<th>Upland (6)</th>
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</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>BRRI dhan 56</td>
<td>BRRI dhan 51 (Swarna-sub 1)</td>
<td>BRRI dhan 47, 53, 54, 55</td>
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<td>BRRI dhan 57</td>
<td>BRRI dhan 52</td>
<td>BINA dhan 8, 10</td>
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<td>BRRI dhan 61</td>
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<td>Indonesia</td>
<td>Inpago Lipi1</td>
<td>Inpara 1, 2, 3</td>
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<td>Inpago Lipi2</td>
<td>Inpara 4 (Swarna-sub1)</td>
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<td>Inpara 5 (IR64-sub1)</td>
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<td>Inpari 29 (Rendaman)</td>
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<td>Inpari 30 (Ciherang-sub1)</td>
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<td>India</td>
<td>Sahbhagi dhan</td>
<td>Swarna-sub1</td>
<td>CR dhan 402</td>
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<td>Samba Mahsuri-sub1</td>
<td>CR dhan 403</td>
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<td>Narendra Mayank</td>
<td>CR dhan 405 (Luna Sankhi)</td>
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<td>Narendra Jal Pushpa</td>
<td>CR dhan 406 (Luna Barial)</td>
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<td>Narendra Naraini</td>
<td>CSR 36</td>
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<td>NDR 8002 (Narendra 8002)</td>
<td>CSR 43</td>
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<td>NDR 9436 (Kala Namak)</td>
<td>NDRK 5088 (Narendra Usar dhan 2008)</td>
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<td>Lao PDR</td>
<td>TDK1-sub1 (candidate)</td>
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<td>Myanmar</td>
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<td>Yemyoke khan saba (Swarna-sub1)</td>
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<td>Nepal</td>
<td>Sukha dhan 1, 2, 3</td>
<td>Swarna-sub1</td>
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<td>Ghaiya 1</td>
<td>Samba Mahsuri-sub1</td>
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<td>Philippines</td>
<td>Sahod Ulan 1, 3, 5, 6, 8</td>
<td>Submarino (IR64-sub1)</td>
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<td>Salinas 6, 7, 8, 9 (+9 recommended)</td>
<td>(Katihan 1)</td>
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<td>Vietnam</td>
<td>OM 8927 (recommended)</td>
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<td>OM 5629</td>
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<td>IR64-sub1 (recommended)</td>
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<td>OM 11271</td>
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Using improved variety and proper management practices in saline areas

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Average Yield (t/ha)</th>
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<td>Farmer’s variety and management</td>
<td>1.77</td>
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<tr>
<td>Improved management, Farmer variety</td>
<td>2.05</td>
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<tr>
<td>Improved variety, Farmer manage</td>
<td>3.0</td>
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<tr>
<td>Improved variety and management</td>
<td>3.87</td>
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</tbody>
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- Tolerant varieties respond better to improved crop and nutrient management thus increase and stabilize productivity

G Gregorio/ RK Singh

Odisha, 21 farmers’ fields
Bangladesh-India-IRRI: collaboration (Protocol signed on 17 February 2013)

- Joint varietal evaluation and release
- Reciprocal recognition of evaluation data for varietal release
- Reducing time for the evaluation of varieties released in neighbouring countries for similar agro-environments
- Reducing time for evaluation for MAS generated varieties
- Pre-release seed multiplication & promotion
- Encouraging private sector by providing level playing field.
- Harmonization of seed system
- Germplasm exchange
Kathmandu Agreement (protocol signed on 18 October 2014)

- Protocol signed by Bangladesh, India and IRRI extended to Nepal

* Three countries agreed to share the evaluation data and varieties released in their respective countries for release and commercialization in the other two countries for similar agro-environments
Implementation of the two agreements

• India notified 4 varieties released in Bangladesh (BINA dhan 8, 10, 11 & 12) for:
  – Direct notification for West Bengal, Assam and Odisha
  – One year evaluation for notification in other states

• India notified Sukha dhan 5 & Sukha dhan 6 released in Nepal for:
  – Direct notification for UP and Bihar
  – One year evaluation for notification in other states
Impact on farmers’ fields

• Binadhan 11 and Binadhan 12 are moving fast among the farmers in India. Breeder seed indent of these two varieties for 2017 was 36 and 130 q, respectively.

• More than 50 private seed producers have demanded BS of DRR dhan 44 and Ciherang-Sub1 in Nepal.
Seeds without borders: regional cooperation for seed sharing

- Review progress; implications and lessons learnt
- Revisit constraints and issues encountered
- Extend agreements in S & SE Asia
- Recognize varietal release and seed certification standards and procedures among countries
- Possibilities to expand to other crops
- Endorse updated seed-sharing agreements
- Strengthen collaboration among countries and regions through regular workshops and visits/tours
- Options of support from development agencies
Seeds Without Borders: Regional cooperation for seed-sharing

- Hosted by H.E. Dr. Ty Sokhun, Secretary of State, Ministry of Agriculture, Forestry and Fisheries, Kingdom of Cambodia
- Cambodia, Bangladesh, India, Lao PDR, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam
- Siem Reap, 9 - 10 June 2017
Siem Reap Agreement

• Signed by Bangladesh, Cambodia, India, IRRI, Nepal and Sri Lanka
• Recognition of each others seed certification system
• Extending agreement to other crops - other cereals, pulses, oil seeds, vegetables, sugarcane and fiber crops.
INNOVATE
CATALYZE
TRANSFORM

Transforming Lives
through the
Global Rice Sector

IRRI