Urgent: Rice Action Agenda for ASEAN+3 and CORRA

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**World: Many Hungry Mouths**

Around 815 million people -- 13 percent of the world's population -- suffer from hunger and malnutrition, mostly in developing countries, said Jacques Diouf, head of the United Nations Food and Agriculture Organization.

Anatomy: food price crisis

(Nominal U.S. dollars, indexed to January 2000 = 100)

- Cotton
- Maize
- Wheat
- Soybeans
- Rice
- Crude Oil

Oil was first to rise
then wheat and corn & soybeans
rice price rice was delayed and steep

Source: Author's computation, from IMF data (www.imf.org/external/data.htm).
There are worrisome indicators of a possible repeat of the 2007-2009 food price crisis.
2007-2008

FAO Food and cereals price index, 2000-2004 = 100
Thai 25% Broken Rice Price
(January 2001 - September 2016)

Data Source: FAO Rice Market Monitor & World Bank
Global rice production expected to recover in 2016
Top 5 Exporters: Rice Stock vs Stock-to-Use Ratio*

*India, Thailand, Vietnam, Pakistan and U.S., USDA Data
Strong Growth in Global Rice Consumption

Data Source: USDA, 2012
Growth of Global Middle Class

Middle income population (million)

Data Source: Kharas (2010)
Urbanization in Asia

Data Source: UNDESA (2015)

Rice Science for a Better World
Global Rice Needs

**Additional rice needed:**
63 million tons by 2030

2014/15 global rice consumption

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Rice growing areas of Asia (in green)

140M ha. grown in single, 2x, 3x crops per year

Preliminary rice extent map developed by IRRI for the Asia-RiCE consortium using MODIS MOD09A1 data (2001-2012)
Monitoring rice supply and health from space...

**ESA Sentinel-1a**
- Images every 12 days
- 20m resolution
- Open access
- SAR sensor perfect for rice

**Sentinel-1b:** images every 3 days starting late 2016
2nd Semester, 2015

Rice
IRRI and partners are deploying new technologies - remote sensing, crop modeling, smartphones and web platforms to share data on when, where and how much rice is produced, as well as crop health assessments and flood/drought damage.

Remote sensing based Information and Insurance for Crops in Emerging economies.

www.riice.org

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Radar (SAR) vs. optical images
What do we see in radar images?

RIICE SAR data provided by ASI/e-GEOS and GISTDA from COSMO-SkyMed, InfoTerra GmbH, and TerraSAR-X

Example in Nam Dinh with images on 26th May, 13th July, and 29th July.
Continuous monitoring

Changes over time used to map where rice is grown, when it is grown, and how much rice is harvested.

- **Preparation**
  - Start of Season (SoS)
- **Emergence**
  - Day 1
- **Tillering**
  - Day 16
- **Flowering**
  - Day 32
- **Ripening**
  - Day 48
- **Harvesting**
  - Day 64
- **Peak of Season (PoS)**
  - Day 80
- **End of Season (EoS)**
  - Day 96

Intensity of the signal

Seasonal Rice Area (RA)
Where? Rice area estimates

Nam Dinh in the Red River Delta

Soc Trang in the Mekong River Delta

Rice map classification accuracy (%) based on comparison against 100 ground truth points per footprint. Consistently above 85%
When? Start of season

Nam Dinh in the Red River Delta

Soc Trang in the Mekong River Delta

Start of Season (SoS) important variable for yield estimation, with crop health and management implications. Early or delayed seasons may mean larger/ smaller imports/exports, areas with shortage of labour or other constraints.
How much? Yield estimates

Compared against crop cut experiments (CCE), yield accuracy at district level = 94%.
Smartphones capture field and crop data, pest/disease outbreaks, and sends data with minimum errors to a central database for analysis and mapping.

Rice Science for a Better World
1. Accelerate introduction and adoption of higher yielding rice varieties.

2. Strengthen and upgrade rice research and breeding pipelines.

3. Accelerate research on world's thousands of rice varieties to exploit the vast reservoir of untapped knowledge within the rich diversity of rice.

4. Develop a new generation of rice scientists for both public and private sectors.
5. Bring about an agronomic revolution in Asian rice production to reduce gaps between potential and achieved yield.

6. Accelerate the delivery of new postharvest technologies to reduce crop losses.

7. Reform policy to improve the efficiency of input and output marketing systems.
8. Increase public investment in agricultural infrastructure.


10. ASEAN+3 must work together and with IRRI to finance and implement the ASEAN Rice Breeding Initiative (ARBI) and the ASEAN Agricultural Innovations and R&D Fund (AIRDF).
ASEAN+3 and IRRI: Initiatives

1. ASEAN+3 Genetics and Rice Breeding Platform (AGRBP)

2. ASEAN Agricultural Innovations and R&D Fund (AIRDF): Building the New Generation of ASEAN Rice Scientists
Training
Short courses
Internships
M.S./Ph.D. scholarships
Visiting scientists

Extension
Professional training
Rice knowledge banks
Rice crop forecasting
ASEAN+3 Genetics and Rice Breeding Platform

IRRI

- Consumer Traits
- Germplasm Exchange
- Hybrid Rice
- Genebank Mining
- Multi Environment Trials
- Breeding Informatics
- Novel Traits & Stacks
- Genotyping & MAS

Countries:
- Japan
- South Korea
- China
- Singapore
- Laos
- Indonesia
- Philippines
- Thailand
- Malaysia
- Vietnam
- Brunei
- Cambodia
- Myanmar
- India

ASEAN+3 Genetics and Rice Breeding Platform
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