

# Evaluation of Rockefeller Foundation (RF) Drought Tolerant Rice Research

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# RF Projects to Develop Drought Tolerant Varieties 1998 to Present

- Goal in all countries and regions to reduce the negative impacts of drought on the poor in rainfed regions
- Important goal in China, UAS Bangalore, & TNAU
  - Reduce water use in irrigated rice
  - Protect against shortage of irrigation water

# Support by Institution

- IRRI – breeding for DT, social science research on coping mechanisms
- China -
  - Breeding - Luo Lijun Shanghai
  - Molecular markers/breeding – Li Zhikang, Beijing
  - GM/markers – Zhang Qifa, Wuhan
- Thailand – participatory breeding, conventional, molecular markers
- South India – breeding, markers, participatory breeding – Ram Babu, TNAU and ??? UAS, Bangalore
- North India – support seed multiplication of Ashoka 200F and 228F by GVT and participatory breeding at Birsa Ag. U. and GVT.

# Types of support

- Training – short term up to PhDs
- Major investment in infrastructure – rain shelters and irrigation at research facilities
- Research support for PPB in Thailand and India

# Cultivars Developed by RF Grantees as of 2007

Rockefeller financed scientists	Location of research	Name of Cultivar	Type of Cultivar	Technique	Year Release
<b><u>CHINA</u></b>					
Dr. Lijun Luo	Shanghai	Hu-han 3	Pureline	Convent	2003
		Hu-han 7	Pureline	Convent	2004
		Huhanyou 2	Hybrid	Convent	2006
		Huhanyou 3	Hybrid	Convent	2006
<b><u>THAILAND</u></b>					
Dr. Griengrai Dr. Boonrat	NE Thailand	Glutinous Aromatic	Purelines	Participatory	2005 2005
	NE Thailand		Purelines	MAS MAS	2012- 2015
<b><u>INDIA</u></b>					
Dr. Chandra Babu	Coimbatore	PMK-3	Pureline	Convent	2003
		RMD 1	Pureline	Convent	2006
		Ashoka 200F, Ashoka 228	Pureline	PPB in North	2007
		PM 01 011	Pureline	Convent	2007
		PM 03 002	Pureline	Convent	2008?
DFID participatory research project	Jharkand	Ashoka 200F, Ashoka 228F,	Purelines	Participatory	2004 National notification

# Evaluation project – 2008 to 2010

- Objective: Assess potential impact of RFs DT rice research and technology transfer
  - Measure social costs and benefits
  - Impact on poverty
  - Efficient combination of research tools?
  - Impact on water use

# Collaborators - Ag Economists

- Dr. Li Luping, Center for Chinese Agricultural Policy, Beijing, China
- Dr. Orachos Napasintuwong, Kasetsart University, Bangkok., Thailand
- Dr. K.N. Selvaraj, Tamil Nadu Agricultural University, Coimbatore, India
- Dr. Ramesh Sharan, Ranchi University, Ranchi, Jharkhand , India

# Key data needs for cost/benefits and impact on poverty

- Yield changes due to DT cultivars
  - “Normal” conditions
  - Drought conditions
- Quality changes due to DT cultivars
  - Market rice prices up or down due to grain quality and time of harvest
- Changes in input use and cost
- Change in cropping patterns?
- Area of adoption – present and projections in future

# Methods – Yields, Quality, Inputs

- Yields change – Change under drought conditions particularly problematic.
  - Experiment station and government trials data
  - Mother baby trials where available
  - Farm household surveys
  - A few cases – China and maybe Tamil Nadu – if varieties approved, farmer tested, but seed not available - we plan to provide seed of approved varieties and survey farmers at end of year
- Quality changes - Household surveys and market/village surveys
- Inputs – household surveys

# Methods – Adoption - Jharkhand

- Area of adoption – Jharkhand
  - Actual area of Ashoka varieties adoption–
    - data from RIU on seed saving, use,
    - data from GVT, CRS, other NGOs, Jharkhand government on distribution of 200F and 228F seed
  - “Counterfactual” - Area of Ashokas adoption without RF project
    - Scenarios of GVT behavior without RF
      1. No seed distribution after 2005
      2. Limited seed distribution funded by Kribco...
    - Plug this into model of farmer’s adoption behavior based on 2004 data collected by GVT working with Wales...
    - Project alternative scenarios..

# Methods – Adoption Elsewhere

- Projection of area of these varieties
  - Any current evidence of adoption
  - Historical adoption patterns
  - Models (in literature) of farmer adoption decisions in these countries
  - Seed supply scenarios
- Counterfactual – spread of similar varieties without project – two scenarios
  - Public sector (Thailand), NGOs, or Private sector would have developed DT rice but later...
  - No alternative development of DT rice

# Impact of varieties on poverty

Plug information on impacts of these varieties into conceptual models of how farmers cope with risk from the literature

Case studies of Eastern India, China, Thailand in Pandey S, Bhandari H, Hardy B, editors. 2007. *Economic costs of drought and rice farmers' coping mechanisms: a cross-country comparative analysis*. IRRI

South India study of coping mechanisms by TNAU group.

# Analysis of research and innovation strategies

- Strategies actually used – PPB, conventional breeding, molecular breeding, and GM traits
- Description of cooperation and competition of strategies in these programs.
  - Description of alternative strategies ??? Public private partnerships???
- Costs of the programs
- Time from start of project to innovation e.g. varieties in farmers fields
- Probabilities of technical success, of commercial success, of extensive distribution of technology to the poor