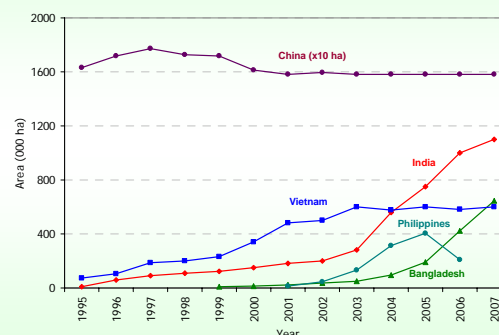


Economics of hybrid rice: Issues and opportunities

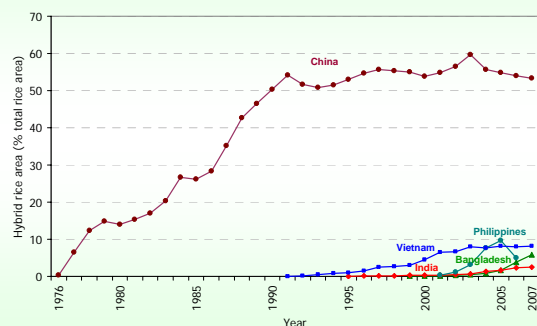
Sushil Pandey
Humnath Bhandari
International Rice Research Institute (IRRI)

Hybrid rice diffusion patterns in Asia



Source: Various publications

Hybrid rice dissemination pattern in Asia



Source: Various publications

Hybrid rice adoption rate in Asia (2006 & 2007)

Country	Hybrid rice area (000 ha)	Percent of total rice area (%)
Bangladesh	647	5.9
China	15800	53.4
India	1100	2.5
Indonesia	135	1.1
Malaysia	1	0.2
Myanmar	13	0.2
Pakistan	61	2.4
Philippines	208	4.9
Vietnam	600	8.2
Asia	18565	13.4

Source: Various publications

Hybrid rice: why adoption rate has been low

Earlier findings

1. Variable performance with yield 15-20% higher
2. Input costs also increase reducing the gains to farmers
3. Poor grain quality resulting in a lower price

Grain yield and production costs of hybrid and inbred rice in Asia

Country/season	Yield (t/ha)			Total cost (US\$/ha)		
	Hybrid	Inbred	Diff (%)	Hybrid	Inbred	Diff (%)
Bangladesh						
1999 Boro	6.4	5.6	14	469	382	23
2004 Boro	7.3	5.9	24	581	533	9
China						
1988/89	6.0	5.2	15	-	-	-
India						
2000/01 AP	6.9	6.6	4	389	312	25
2000/01 KT	8.4	7.4	13	395	340	16
Philippines						
2003 WS	5.5	5.1	8	490	457	7
2004 DS	5.3	4.8	11	522	499	5
Vietnam						
2004 WS	5.4	5.3	2	583	541	8
2004 DS	6.3	5.8	10	565	564	0

Source: Various publications

Hybrid rice: New opportunities



1. High price of rice
2. Expansion of *boro* rice area due to shallow tubewell development
3. Continued technological progress
4. Expanded possibilities for public-private partnerships
5. Rising demand for rice from Africa

What makes hybrid rice different from inbred rice?



1. Farmers need to purchase seeds every year
 - ❖ Financial capacity to buy seeds
 - ❖ Seed cost
 - ❖ Timely availability of seeds
 - ❖ Dependence on commercial channels for seed supply

What makes hybrid rice different from inbred rice?



2. Planting methods
 - ❖ Low seed rates and careful spacing
 - ❖ Transplanting as the only viable method, direct seeding not an option
3. Farmers' Financial capacity to invest in more inputs
4. Grain quality issues

Factors contributing to early success of hybrid rice in China



- Centrally planned system that facilitated faster diffusion
- Rice area being mostly irrigated
- Grain quality less of a concern
- Public sector development and promotion of hybrid rice

Hybrid rice in unfavorable areas?



- Factors likely to favor adoption of hybrid rice in rainfed areas:
 - ❖ Small farms in rainfed areas likely to adopt hybrids for meeting food needs
 - ❖ Hybrid rice may have some drought tolerance
 - ❖ Private sector actively promoting hybrid rice

Hybrid rice in unfavorable areas?



- In reality, adoption is very limited and is taking place under the following conditions:
 - ❖ Farmers who have the financial capacity to invest
 - ❖ In fields with favorable water supply (supplemental irrigation)
 - ❖ Farmers who are market-oriented

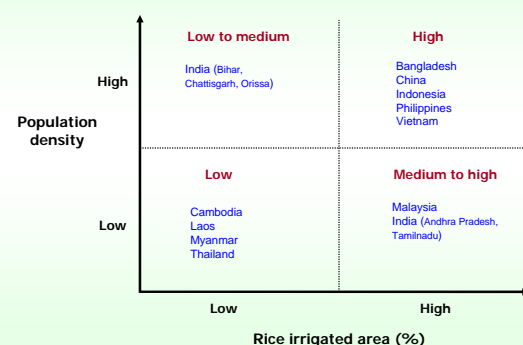
Philippines experience on hybrid rice



- Despite massive government support and subsidy, coverage of hybrid rice on 5% area only
- High drop-out rates (67-86%)
- Rapid adopters were also rapid drop-outs

C David 2005

Hybrid rice suitability in Asia



Potential impact of hybrid rice (excluding China)



Region/Ecosystem	Area (million ha)	Adoption rate in 10 years (%)	Yield gain (%)	Total production increase (million tons)
South Asia				
Rainfed	26	15	10	0.7
Irrigated	32	25	20	8.0
Southeast Asia				
Rainfed	25	15	10	1.0
Irrigated	18	25	20	5.0
Total				15

Assumed yield gains and adoption rates

Implications



- HR does have a role to play for future food security.
- The current high price of rice provides a tremendous opportunity
- Diffusion likely to be modest without efficient seed system
- Adaptive research and careful targeting (env and farmer)
- Better technology for low cost seed production
- Nurturing of public-private partnership
- Research to improve grain quality