

IRRI's Perspective on Production Economics and Rice Production systems



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IRRI

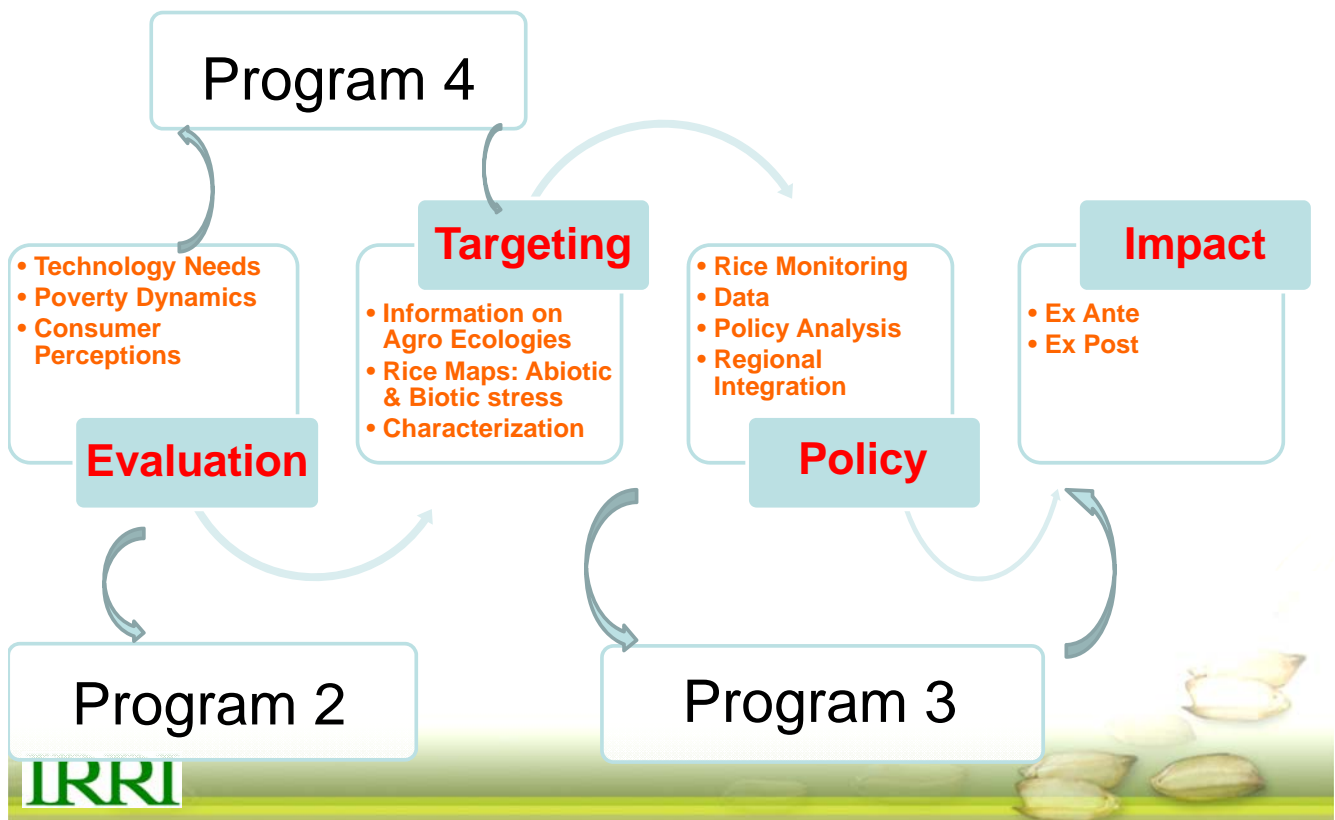
Acknowledgements

- H. Bhandari, IRRI
- Pie Moya, IRRI
- Thelma Paris, IRRI

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Program 5: Targeting & Policy

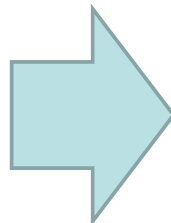
4 Product Lines & 12 Products



Core Activity

Collection of farm household data to:

- Identify technology needs of the farmers
- Understand constraints to adoption
- Analyze adoption patterns including the role of women in technology adoption
- Analyze unintended consequences of technology interventions
- Monitor and evaluate adoption
- Establish a baseline for ex post impact assessment



Data on input, output, prices and costs of rice production and farm household demographics are collected for all surveys

Studies on the rice production systems have been done in several Asian countries



Accessible online at

WWW.IRRI.ORG

Click on “**Knowledge**”

Click on “**Household Survey Database**”

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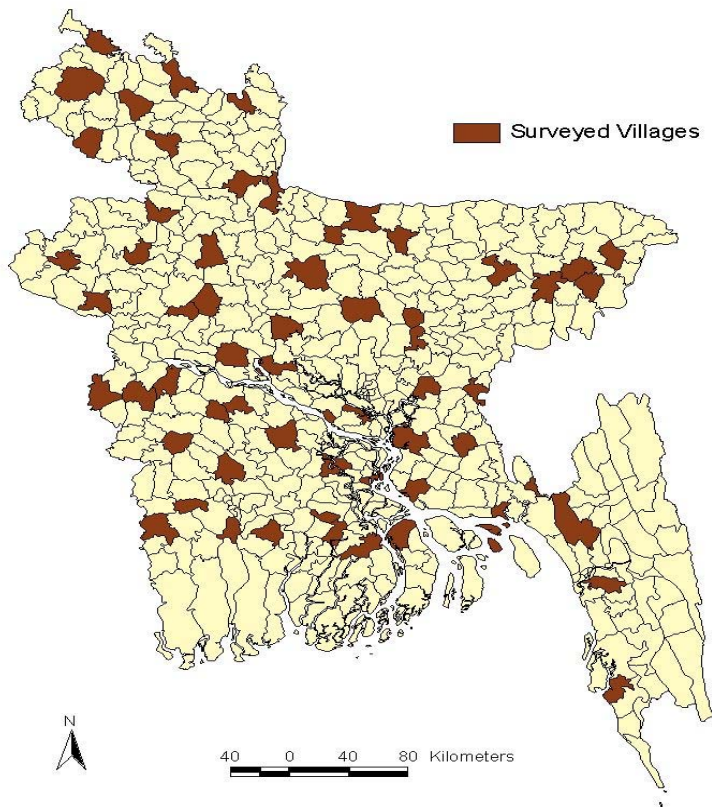
Central Luzon Loop Survey

- Started in 1966/67
- Every four years
- 2011/12 (latest survey)



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Bangladesh Panel Data, 1988-Present



Data are available for four different periods:

1987/88 (IRRI-BIDS)

1999/00 (IRRI)

2003/04 (IRRI)

2007/08 (BRAC)



1987/88 Survey

- The benchmark survey was conducted in 1987-88 covering 1231 households
 - Selected from 62 villages in 57 out of 64 districts
 - A random sample of 20 households were drawn from each village.
 - Covered all agro ecological zones in Bangladesh.
 - Implemented by BIDS and IRRI



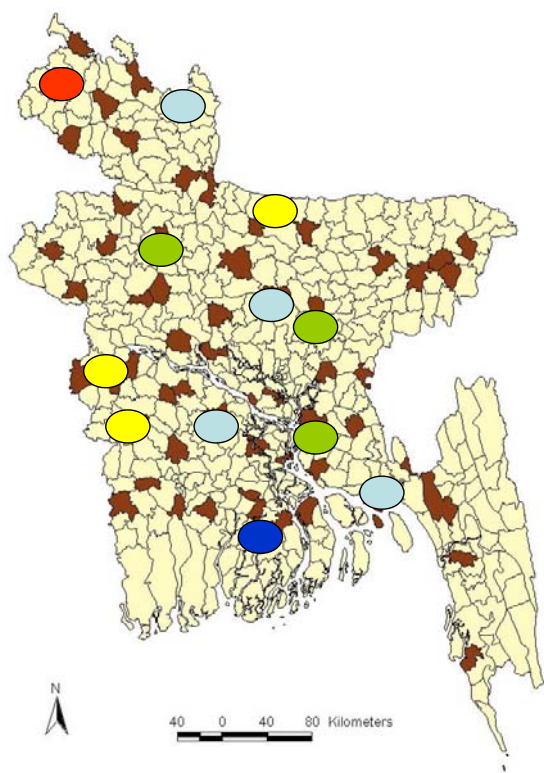
Data collection

- demographic characteristics of all household members
- use of all parcels of land owned and operated by the household
- costs and returns on the cultivation of major crops
- purchase of inputs and the marketing of products
- ownership of non-land assets
- employment of working members and earnings from non-farm activities, and
- the perception of the households regarding changes in its economic conditions.

Source: Uttam Deb and Alamgir Choudhury

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High Frequency Data Collection (2009 onwards)



Villages	District	Remarks
Boikuntapur	Thakurgaon	Drought
Rasun Simul Bari	Kurigram	Flood prone
Daricamari	Bogra	Favorable
Khudiakhali	Chuadanda	Favorable - Drought
Dakhin Kabirkati	Patuakhali	Coastal
Paschim Bahadurpur	Madaripur	Flood prone
Pthordia	Narshingdi	Favorable
Nishaigonj	Mymensingh	Flood prone
Bhobanipur	Comilla	Favorable
Begumpur	Chandpur	Flood prone
Niamatpur	Jhenaidaha	Favorable-Drought
Konapara	Mymensingh	Favorable- Drought

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Data collection Modules

Data collection modules	Frequency of data collection
M1 – Household census schedule	Project beginning (2009)
M2 – General endowment schedule	Annual
M3 – Plot-list and cropping pattern schedule	Every season (3 seasons)
M4 – Employment schedule	Every month
M5 – Income and expenditure schedule	Every month
M6 – Price schedule	Every month
M7 – Rainfall schedule	Every day
M8 – Crop cultivation schedule	Every season (3 season)
M9 – Livestock schedule	Every month
M10 – Health and nutrition	Annual

Household Poverty Dynamics During a Commodity Price Spike: Evidence from Bangladesh (forthcoming in Agricultural Economics)

Joseph V. Balagtas, Purdue University; Elanie Cabrera, IRRI; Humnath Bhandari, IRRI; Sam Mohanty, IRRI and Mohabub Hossain, BRAC

	1988	2000	2004	2008
Sample size	1,238	1,872	1,927	2,010
HH size	5.9	5.4	5.3	4.9
Farm size (ha)	0.62	0.54	0.48	0.47
Nonfarm HH (%)	34	42	39	43
Area under tenancy (%)	22	33	40	14
Ag workers (no.)	1.2	0.9	1.0	0.8
Nonag workers (no.)	0.7	0.9	0.9	0.7
Domestic migrants (no.)	0.2	0.4	0.4	0.5
Overseas migrants (no.)	0.01	0.1	0.1	0.2

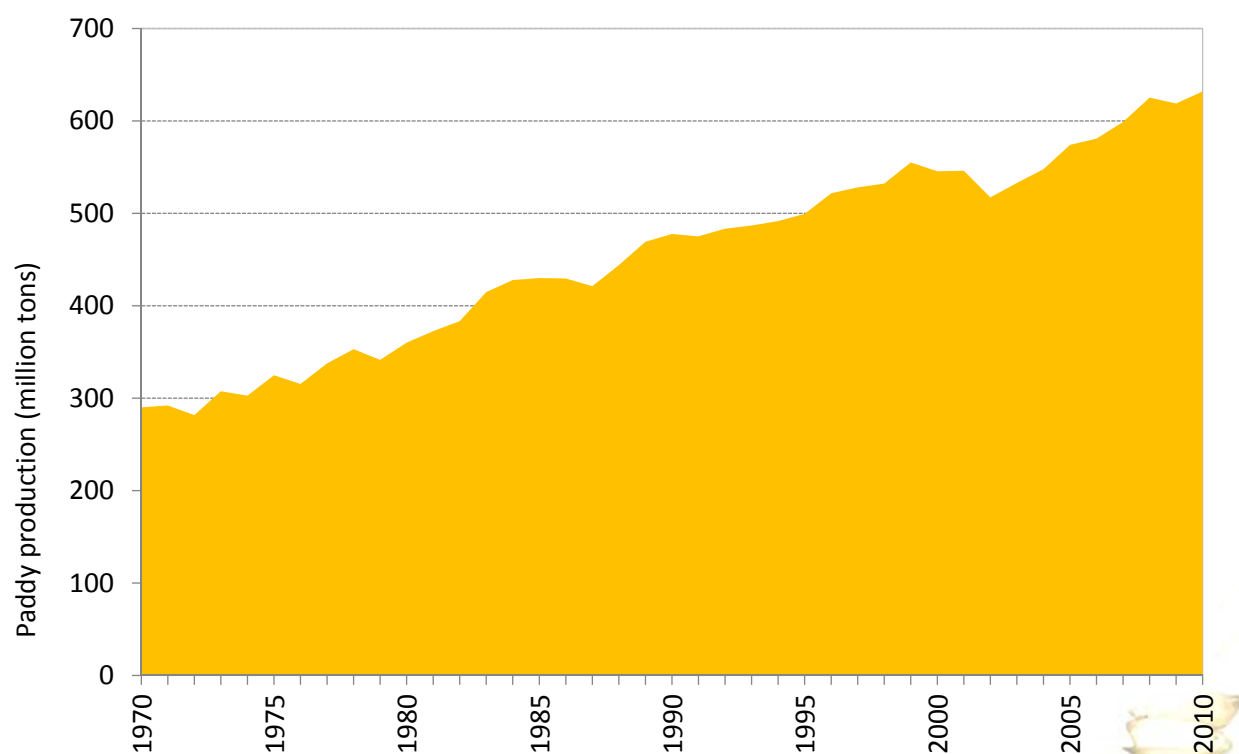
- Commodity market volatility + global recession
➔ reversal of long trend out of poverty
- Increased poverty incidence driven by an increase in transitory poverty (25% to 37%)
 - Rates of exit from poverty largely unchanged (60%)
- Chronic poor are more reliant on agricultural income, and increasingly so
 - Nonfarm households and land renters tend to be poor
- Chronic poor less reliant on non-farm income
 - Could this have protected them from global recession?
 - A cautionary tale for those recommending non-ag income sources as pathway out of poverty

Selected Sample Statistics

Summary Findings

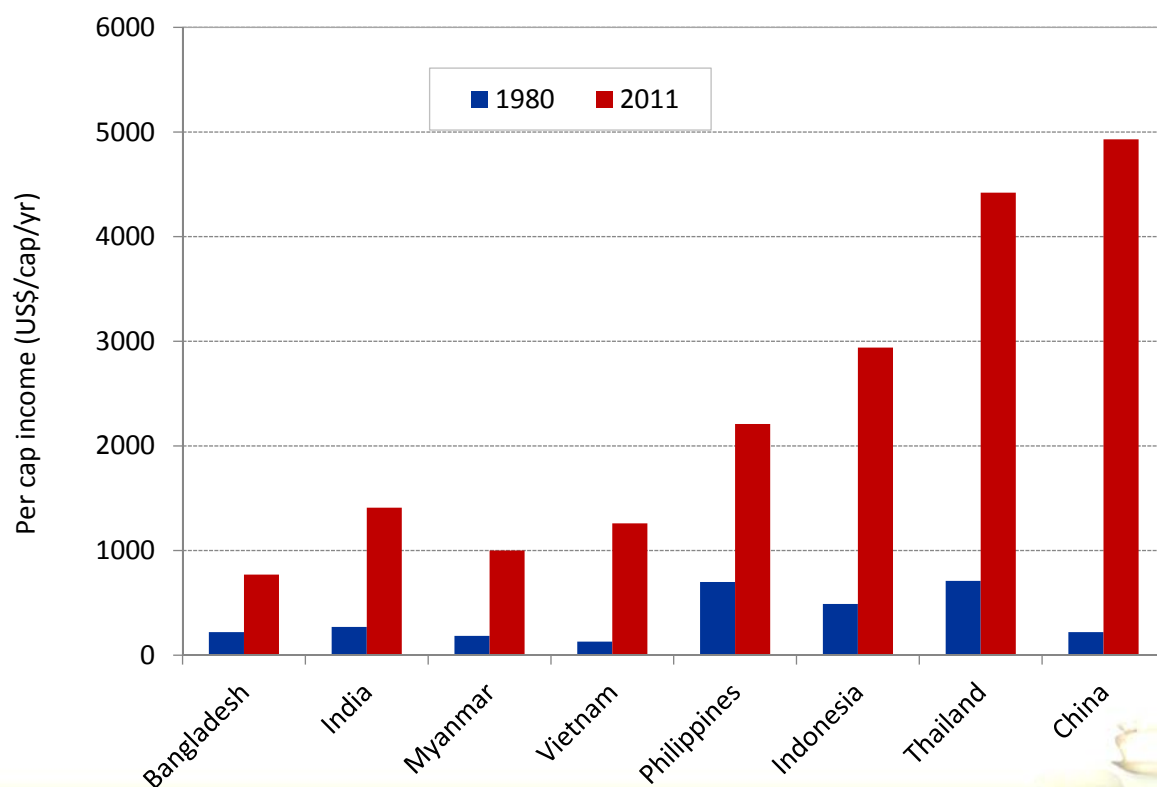


Rice production in Asia, 1970-2010



IRRI

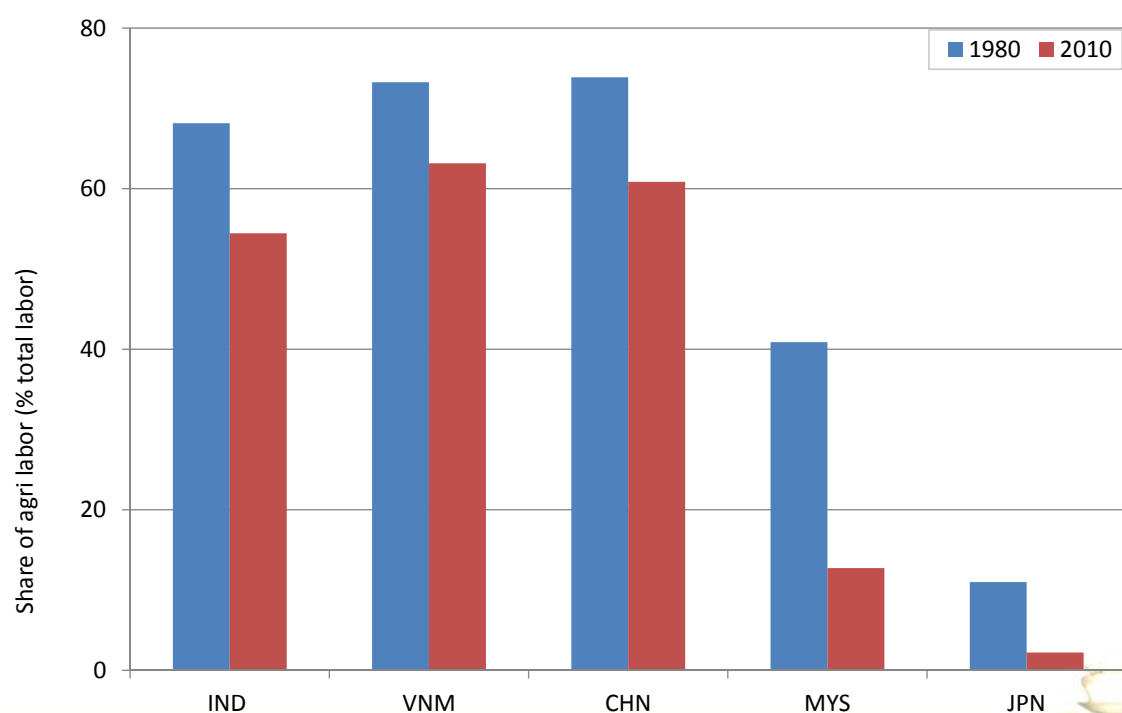
Income rise in Asia, 1980-2011



IRRI

Source: Bhandari, IRRI

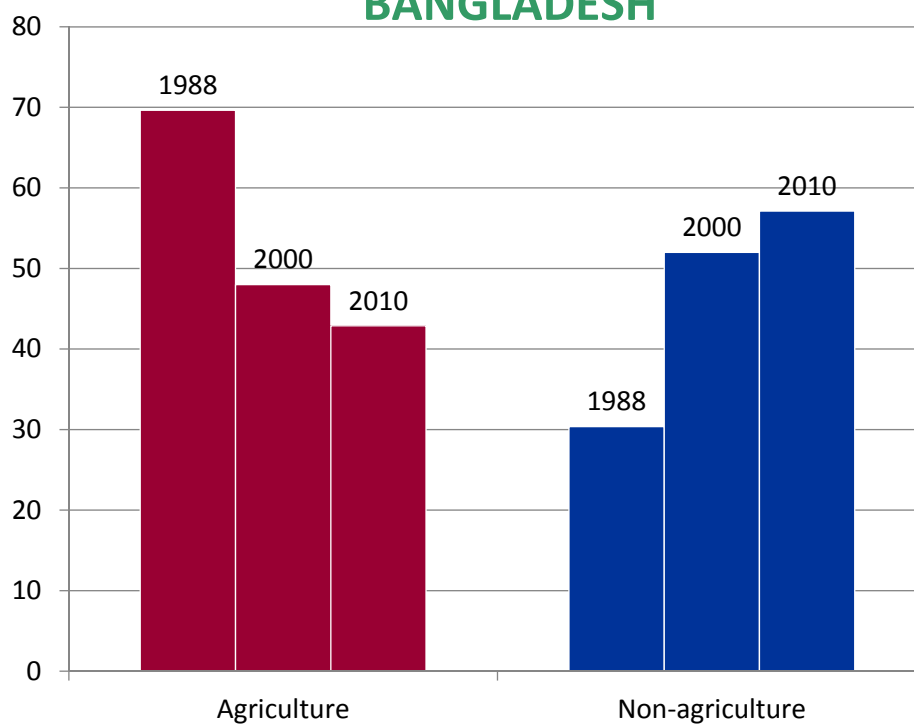
Agriculture share of total employment, 1980-2011



IRRI

Source: Bhandari, IRRI

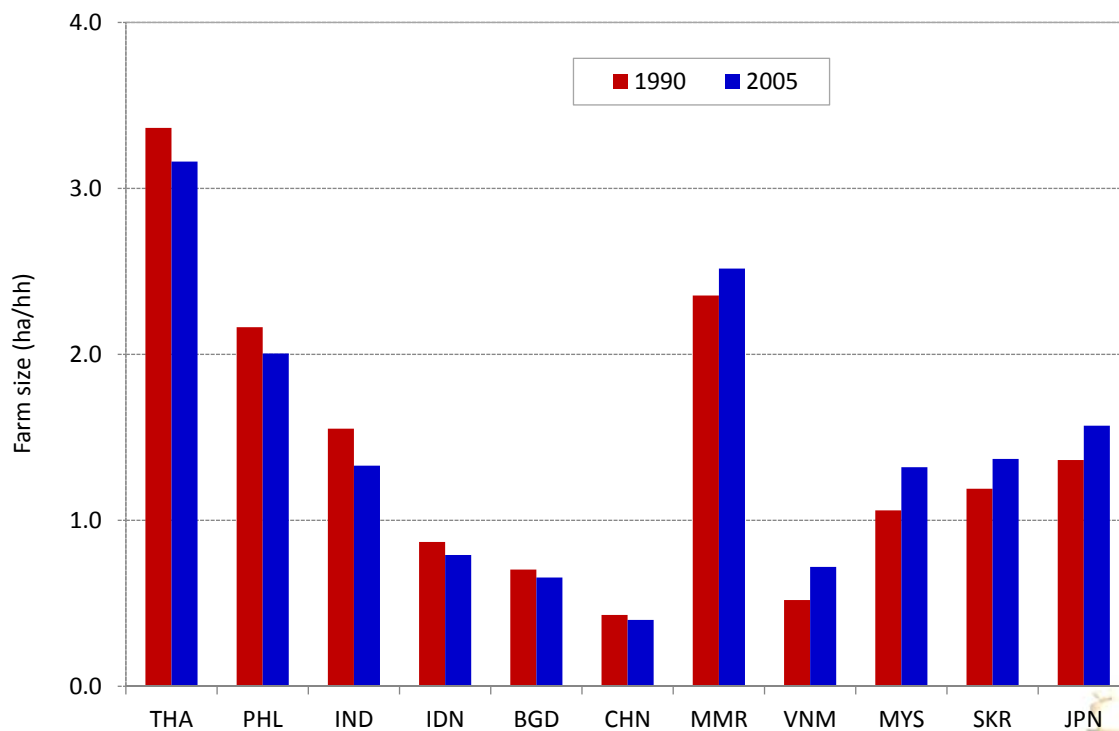
Changes in primary occupation: BANGLADESH



IRRI

Source: Bangladesh panel data

Trends in farm size in Asia, 1990-2005



IRRI

Source: Bhandari, IRRI

Changes in asset endowments

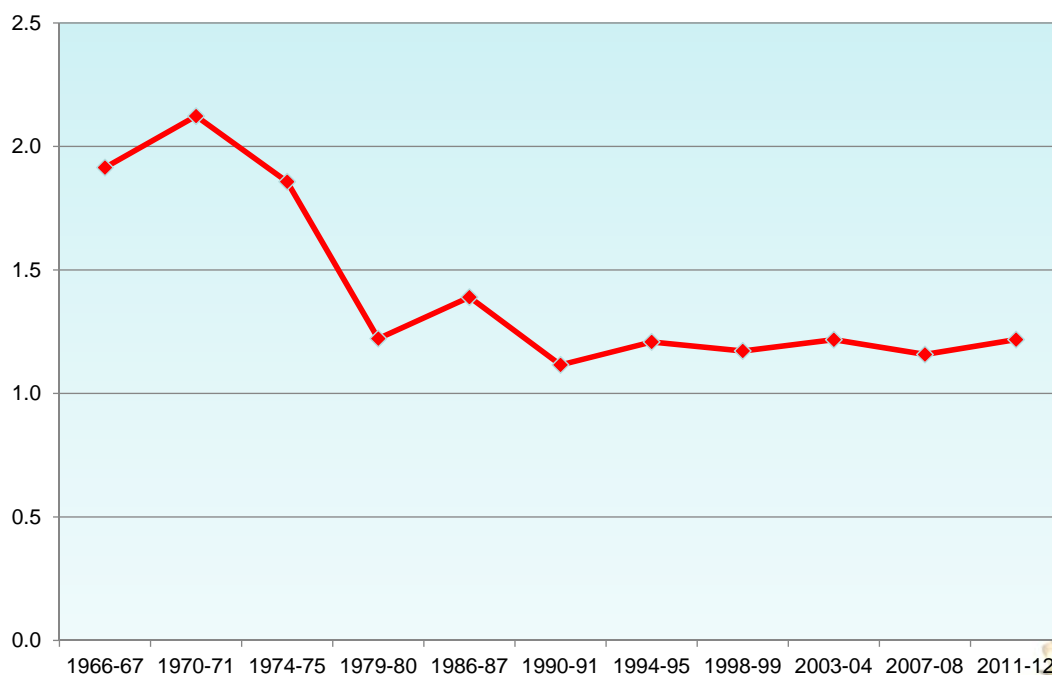
	1988	2000	2010
Natural capital			
Farm size (ha/hh)	0.61	0.53	0.48
Irrigated land (%)	25	55	64
Area under tenancy (%)	16	20	33
Human capital			
Total worker (no./hh)	1.36	1.43	1.64
No. of migrants (no./hh)	0.26	0.61	0.86
Av. education (yr)	3.2	4.1	5.2

IRRI

Source: Bangladesh panel data

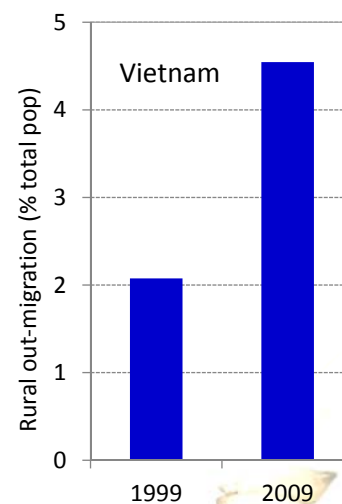
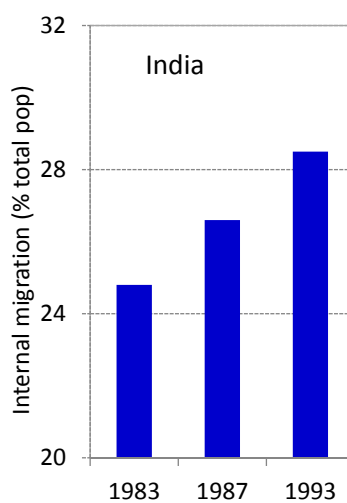
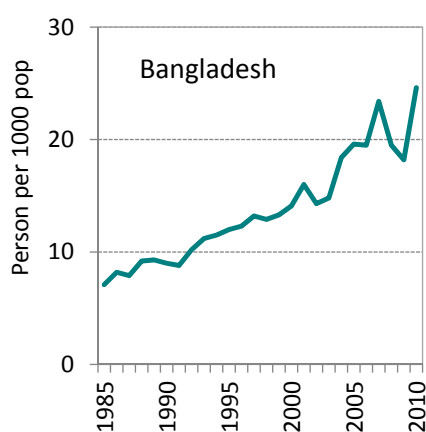
Change in Farm Size, Central Luzon, Ph

Hectare

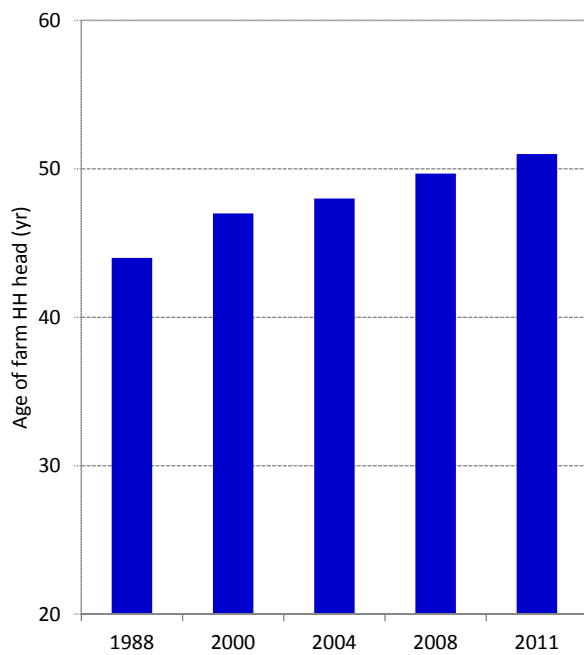


Source: Loop survey

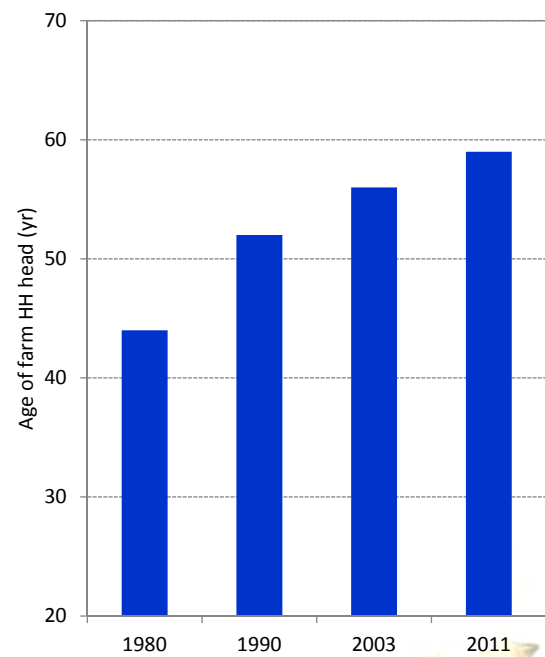
Rural out-migration in Asia



Age of farm household head in Asia



Bangladesh

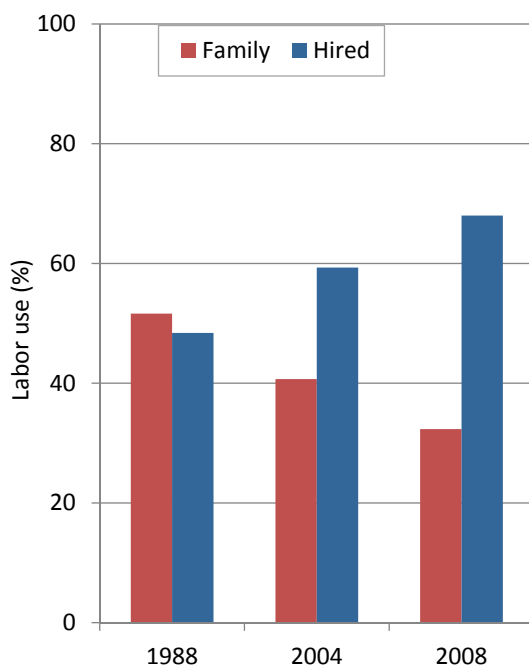


Philippines

Source: Bangladesh panel & Loop survey



Family and hired labor use in rice farming



Bangladesh

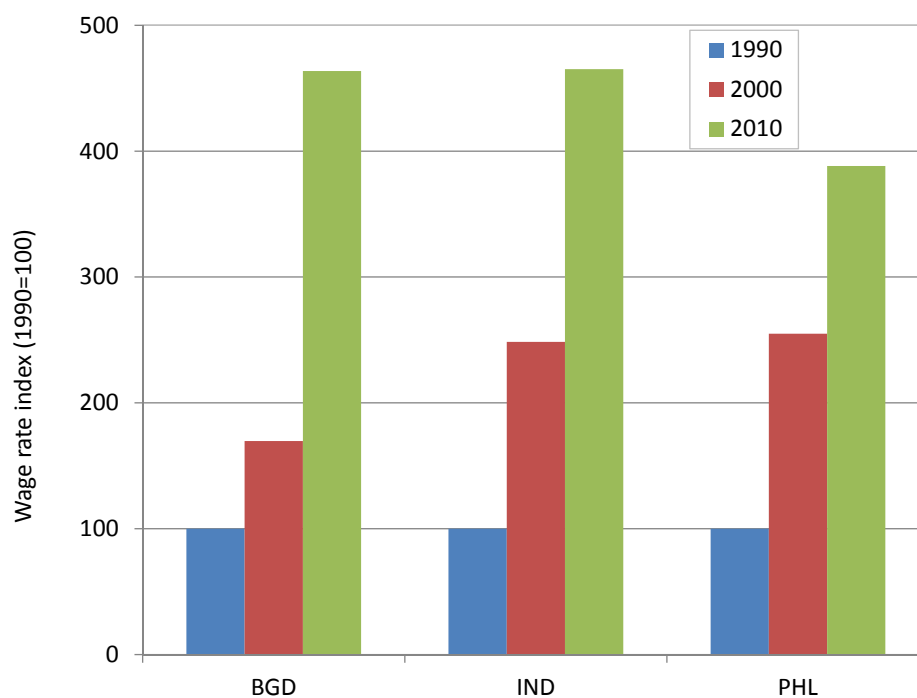


Philippines

Source: Bangladesh panel & Loop survey

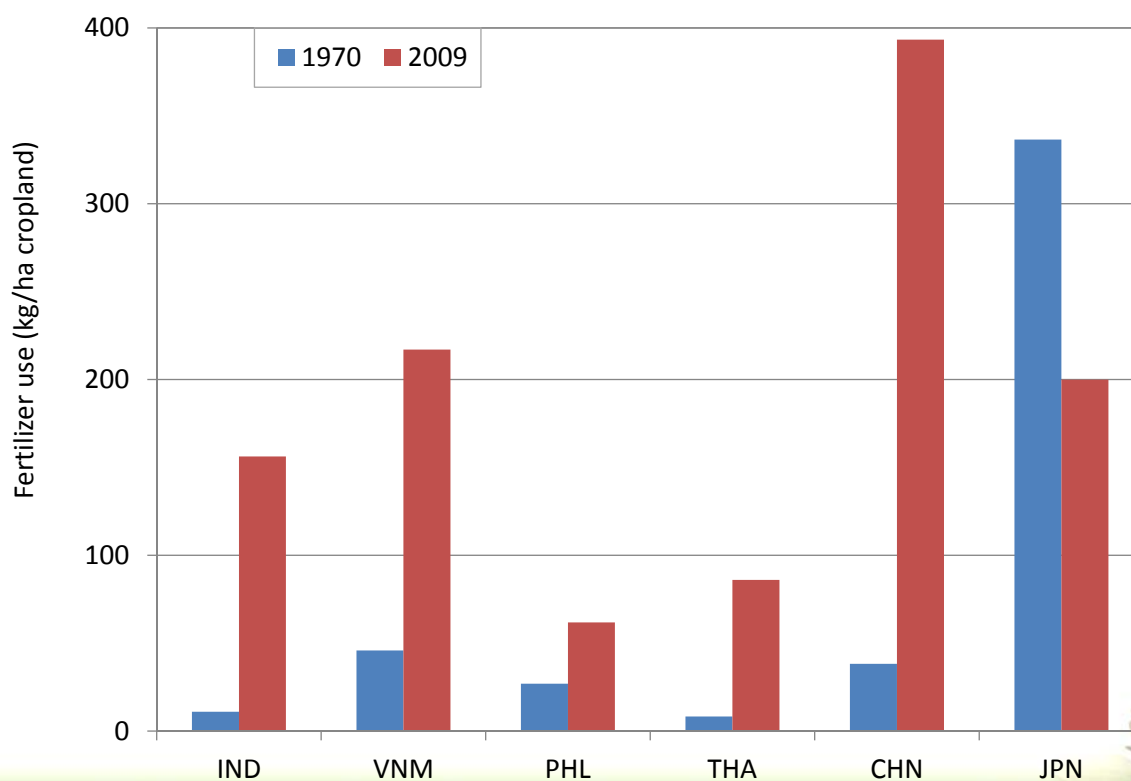


Increase in wage rate of agricultural labor



IRRI

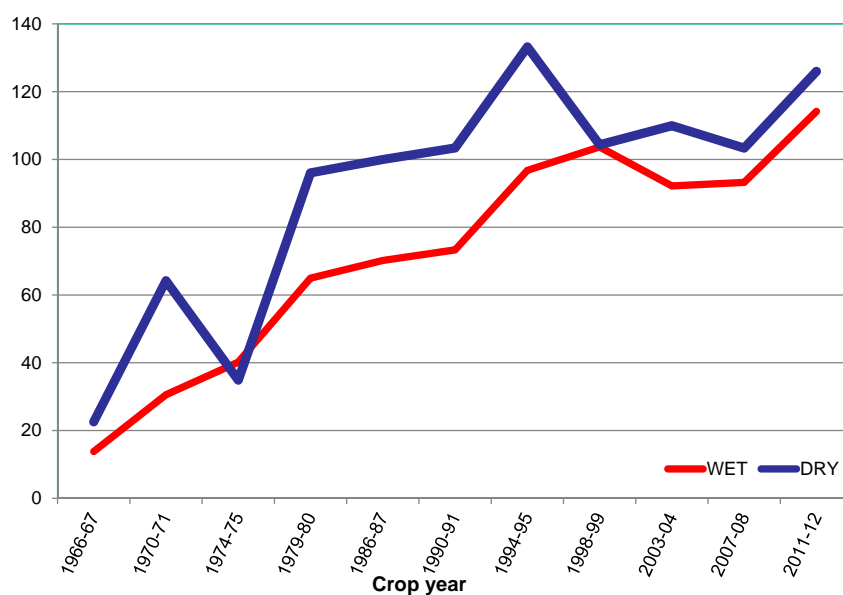
Fertilizer (NPK) use in agriculture, 1970-2009



IRRI

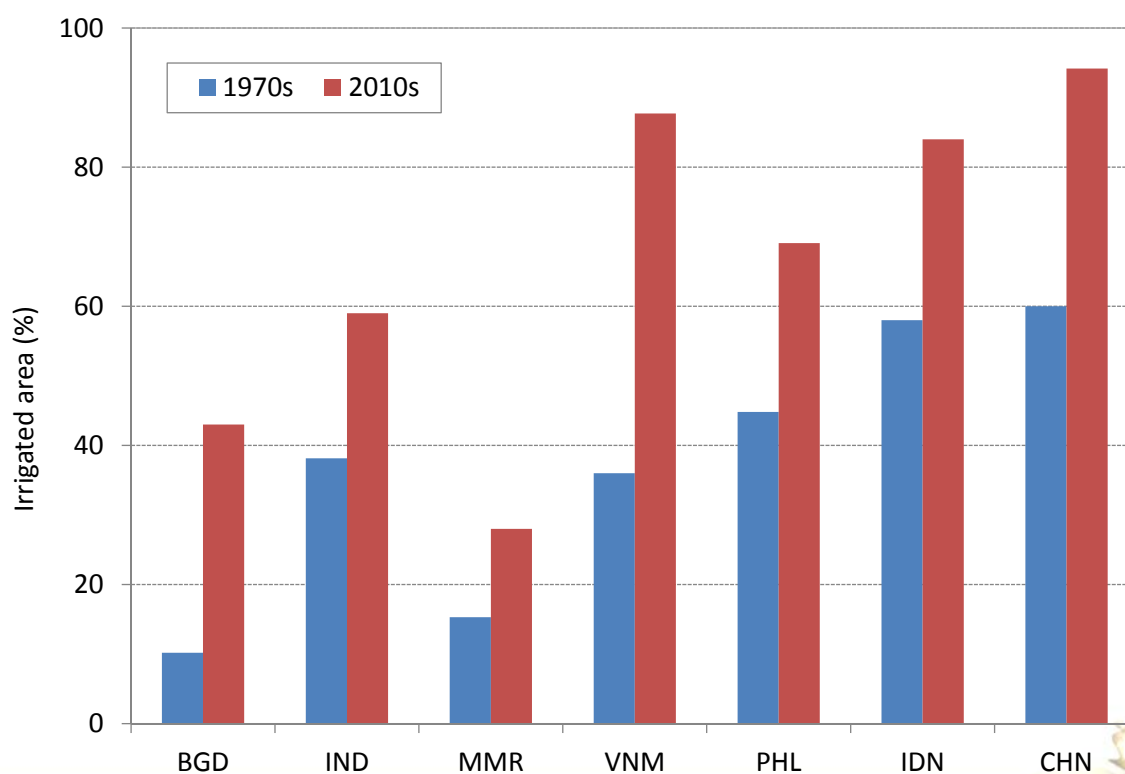
Source: Bhandari, IRRI

NITROGEN (N) FERTILIZER USE PER HECTARE, CENTRAL LUZON FARMS, PHIL. 1966-2012

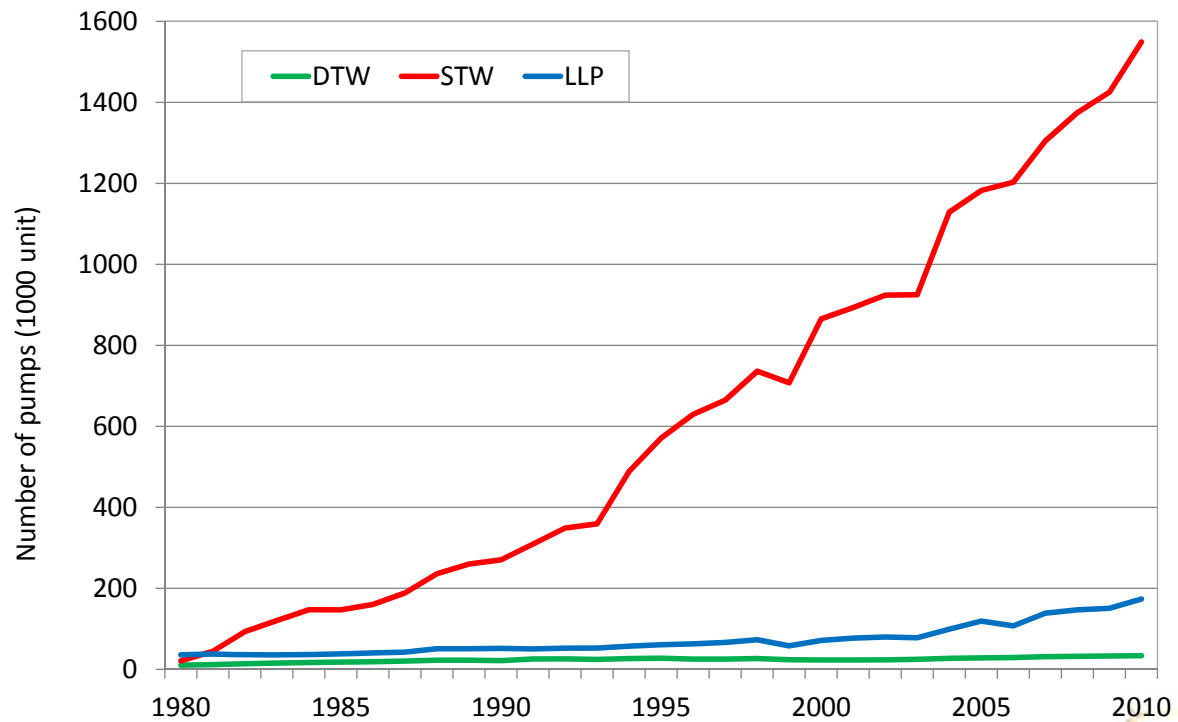


Source: Loop survey

Irrigated rice area, 1970s and 2010s

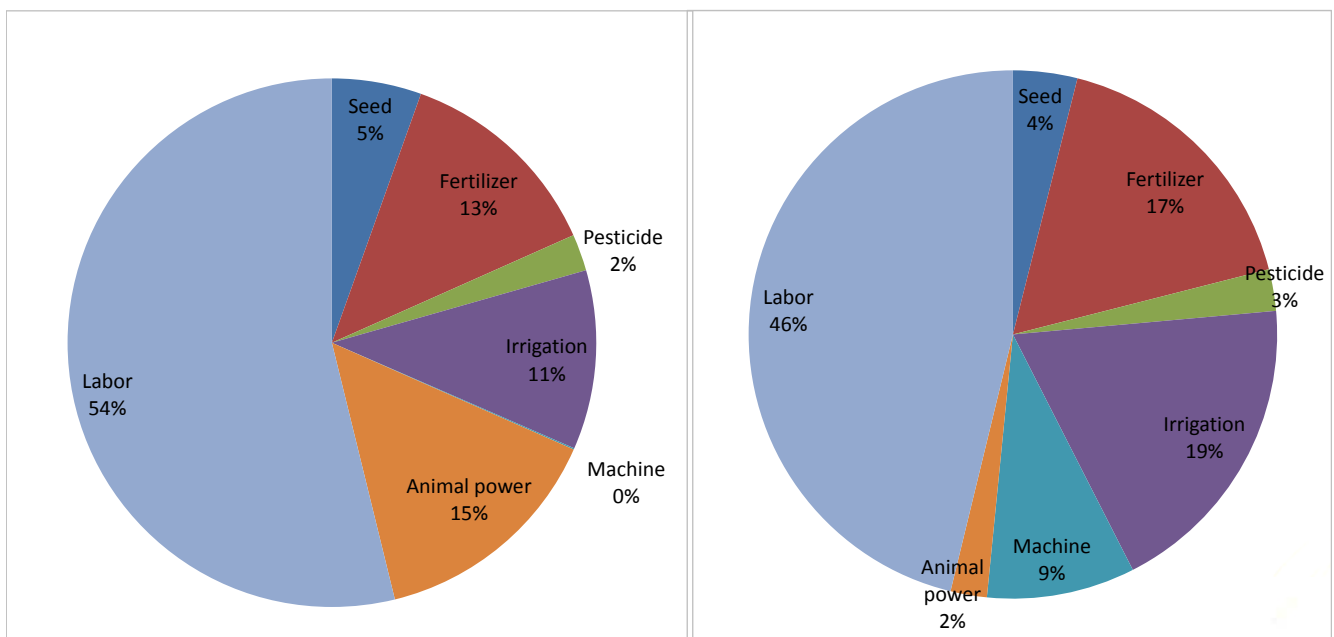


Pump irrigation in Bangladesh, 1980-2010



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Distribution of rice production cost, Bangladesh

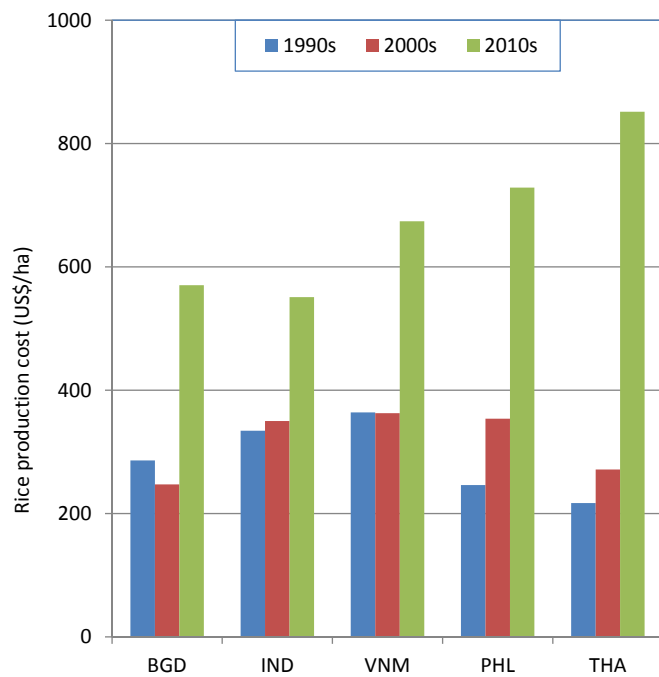


1988

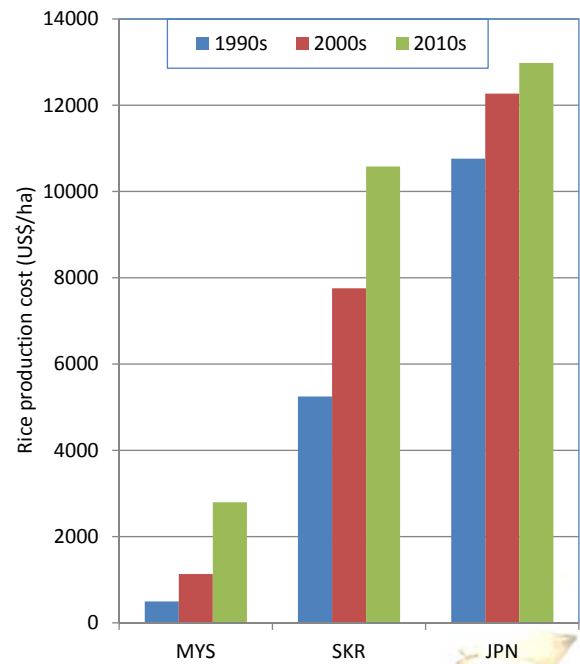
2008

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Rice production cost in Asia



Developing Asia



Developed Asia



Women in Rice Farming





Harvesting



Transplanting



Threshing



Weeding

Women in Rice Farming

Changing Role of Women

- **Drivers**
 - Migration of male labor
 - The adoption of labor-saving technologies and mechanization
 - Social and cultural norms regarding female labor





Cleaning the dikes



Fertilizer application



Pest control



Pest control

Chi et.al., 2006



Empowering women as entrepreneurs in transplanting rice



Tamil Nadu, India CSISA project

Opportunities to address the changing gender roles

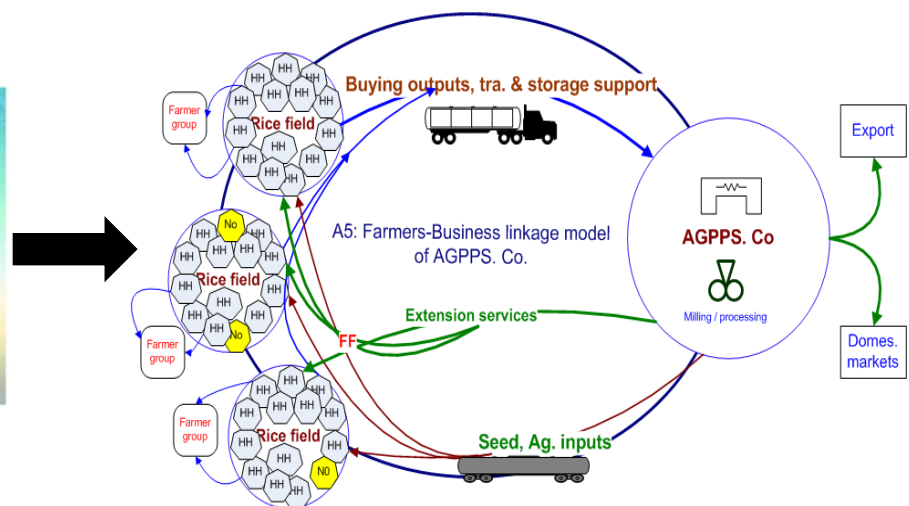
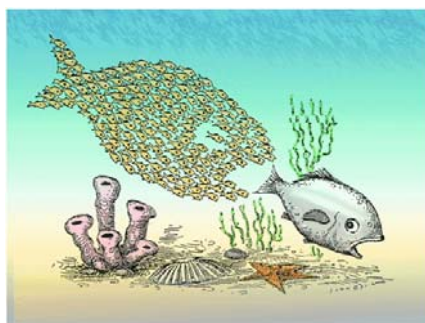
- Train women as farm managers (on crop/farm management) and as entrepreneurs
- Provide training on non-traditional jobs eg. machinery repair and making spare parts in anticipation of machinery adoption
- The adoption of mechanical transplanters will increase in the future with labor shortages
- Need to explore other opportunities for displaced women workers by organizing and training women to operate and own-for renting out machines
- Develop custom-made equipment/machines for women to address the drudgery and labor efficiency in rice farming
- Employ more women in agro-processing or value adding agriculture-based income generating activities and other livelihood activities in the rural areas e.g increasing crop diversification



Source: Paris, IRRI



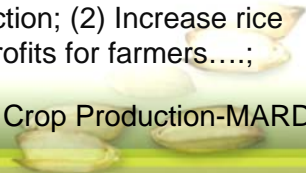
Large Rice Field Model in Vietnam



- large fields enough (from 50-500 ha)
- Farmers are voluntary to participate
- Availability of input dealers and enterprises (exporters) to buy farmer product thru contract farming
- Efficiency: (1) Reduced costs of production; (2) Increase rice productivity and quality ; (3) Improve profits for farmers....;



Source: Pham van Du, Department of Crop Production-MARD



Concluding Remarks

- Farming population is declining and aging
- Labor scarcity is increasing
- Roles of men and women are changing
- Technology focus: small farms, labor saving, women & old farmers, new cropping system, etc.