Agricultural Research and Extension in India

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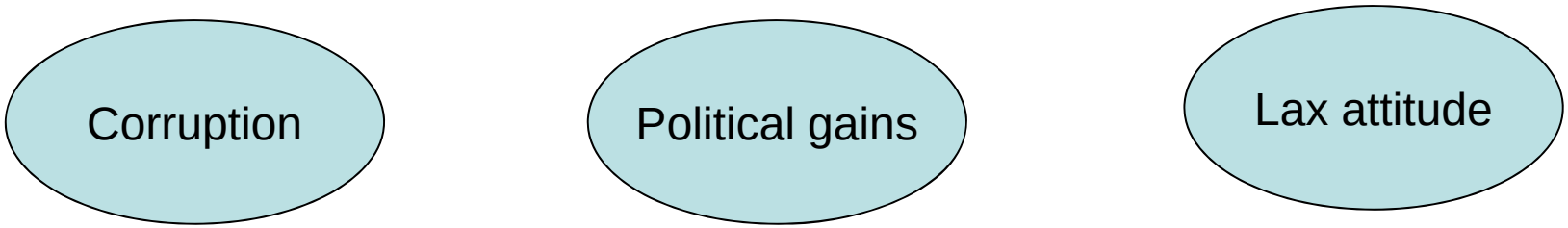
Agriculture in India- *a complex situation*

- Diverse agro-ecological conditions
- Diverse composition of farming community
- Diverse situations
- Diverse stakeholders
- Diverse players



Indian Agriculture

- > 65 % people dependent on agriculture
- Wide diversity of crop
- Abundant natural resources
- Traditional knowledge
- Large workforce

The Great Divide

Dominant Paradigm

- Green Revolution
  - Nation’s self sufficiency as goal
  - Public Sector playing major role
  - Public extension
  - Irrigation playing major role
  - Technology transfer public to private
  - Free technology-input intensive
  - Input intensive
  - Controlled markets
  - Public Distribution System

Green Revolution Framework

Commodity –input centric
Seeds, Fertilisers, Pesticides, Irrigation

Sanskritisation
cropping patterns/production practices/food habits

Monocropping/Monoculture

Support only for marketable products

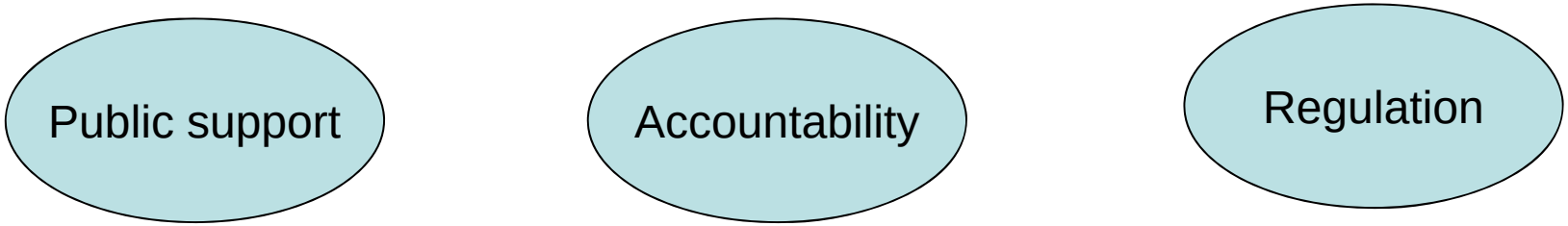
MSP, Procurement, PDS
Distant markets

High externalities-never accounted for

Efficiency and productivity

two myths that drive Indian agriculture

- Climate
  - Rainfall -monsoon/intermittent rains
  - Temperature and diurnal variation
  - Day length –long days/short days
- Natural Resources
  - Soil: health, nutrients and texture
  - Water: ground and surface
- Crop diversity
  - Suitable
  - Adopted
  - choice



Net Returns per ha over Investment for Different Crops

Crops	*Marginal Farms*			*Small Farms*		
	1991-92	*1992-93*	*1993-94*	*1991-92*	*1992-93*	*1993-94*
			Net Returns			
Paddy	2235	1758	696	3010	2328	1049
Cotton	3862	2757	1407	3962	2962	1637
Chilly	3913	3073	1573	5098	4428	3023
Groundnut	4602	3950	1371	4900	4282	1302
Sunflower	5975	5195	3417	5750	5075	3875

Source: State of Indian Farmer, A Millennium Study, 2004, Min of Agriculture, GOI

Returns per Rupee Investment for Different Crops

Crops	*Marginal Farms*			*Small Farms*		
	1991-92	*1992-93*	*1993-94*	*1991-92*	*1992-93*	*1993-94*
Paddy	1.51	1.39	1.15	1.66	1.50	1.21
Cotton	1.99	1.68	1.34	1.98	1.71	1.38
Chilly	1.59	1.45	1.23	1.74	1.64	1.43
Groundnut	2.10	1.87	1.28	2.05	1.85	1.24
Sunflower	2.44	2.20	1.77	2.31	2.12	1.83

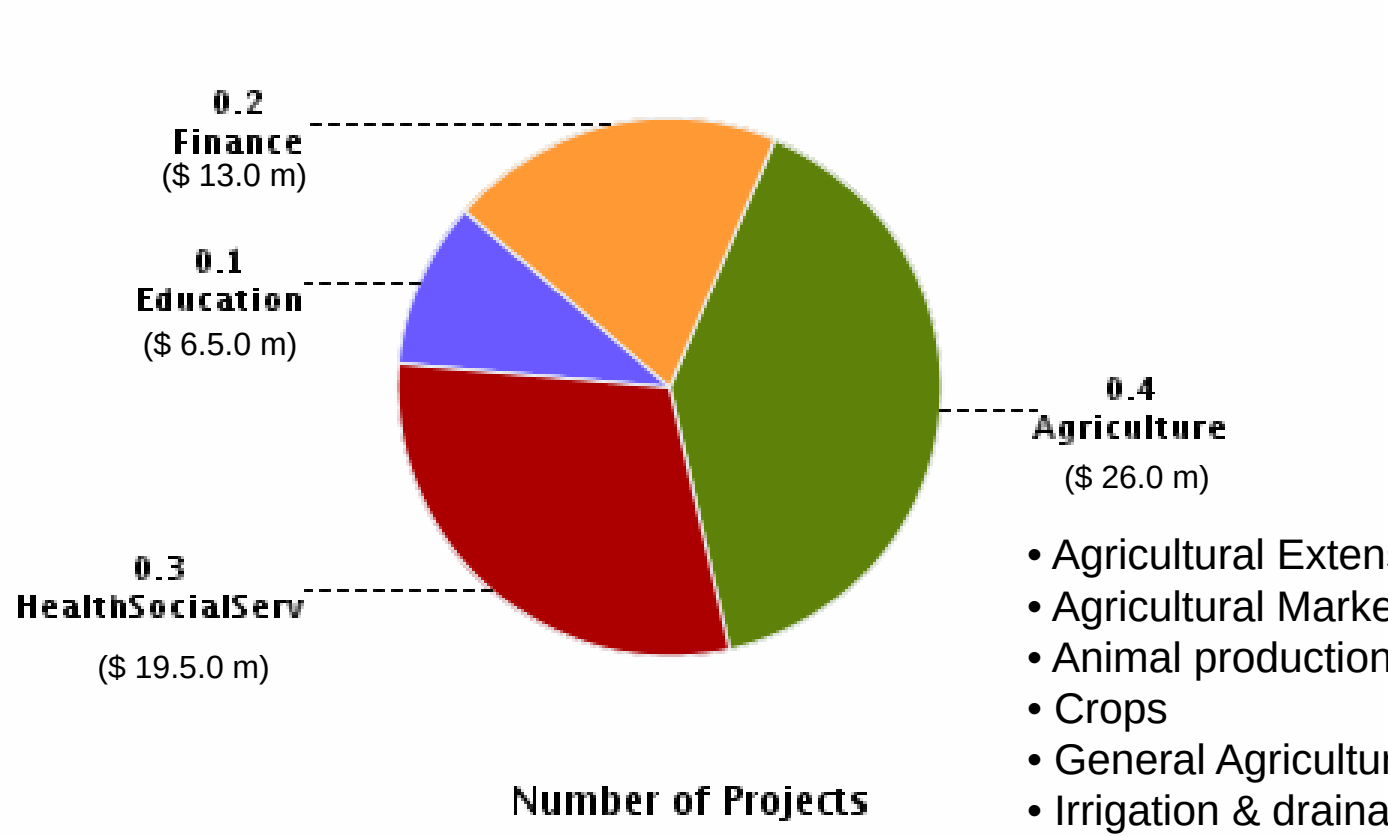
Source: State of Indian Farmer, A Millennium Study, 2004, Min of Agriculture, GOI

Green Revolution

World Bank Support

High Yielding Varieties	Tarai Seeds Project, National Seed Projects 1-3
Agro-Chemicals	Chemical Fertilisers, Agricultural Aviation Project
Farm Mechanization	Agriculture Machinery
Irrigation	Major Irrigation Dams

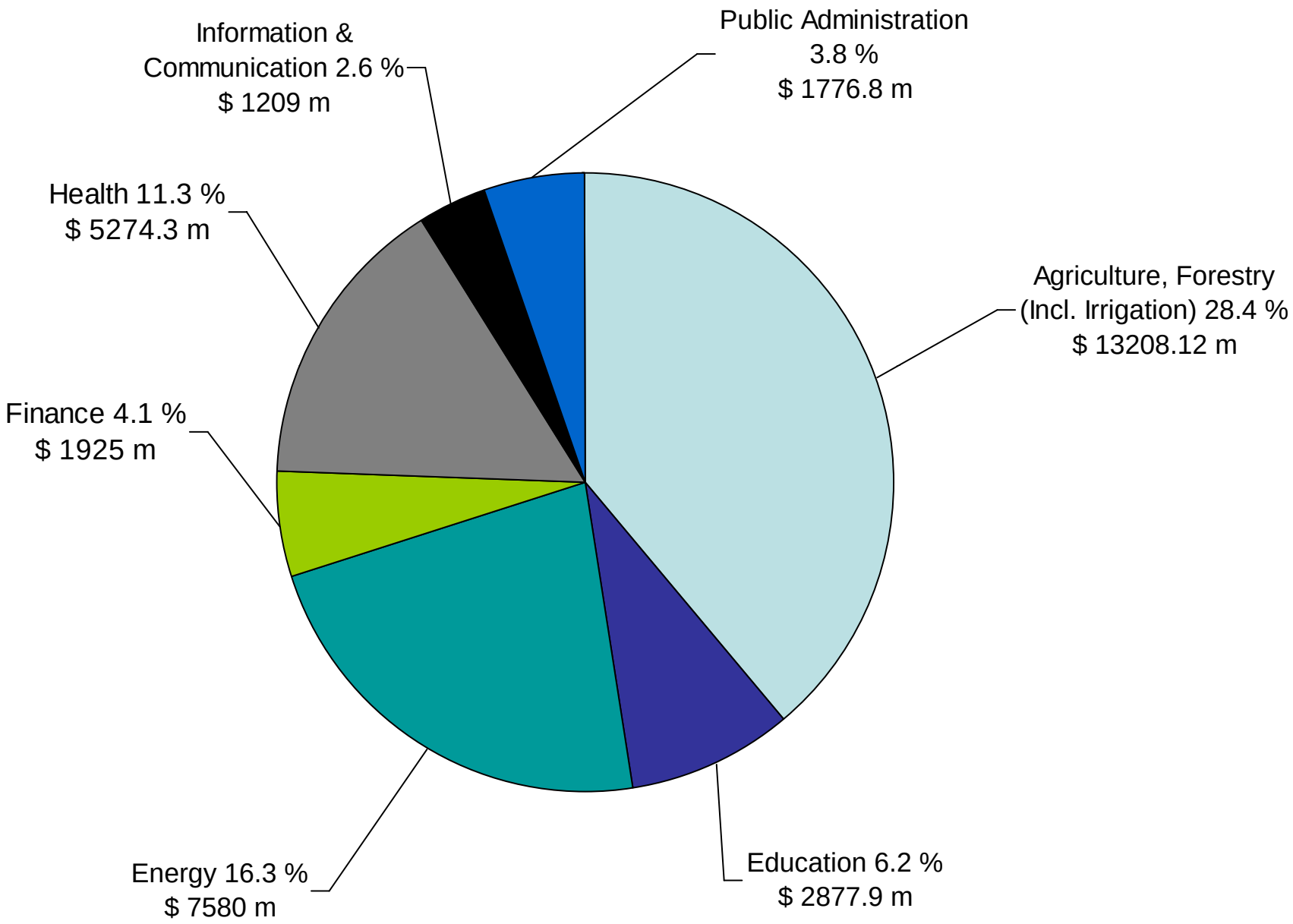
Current situation with regard to WB and agriculture-related projects in India



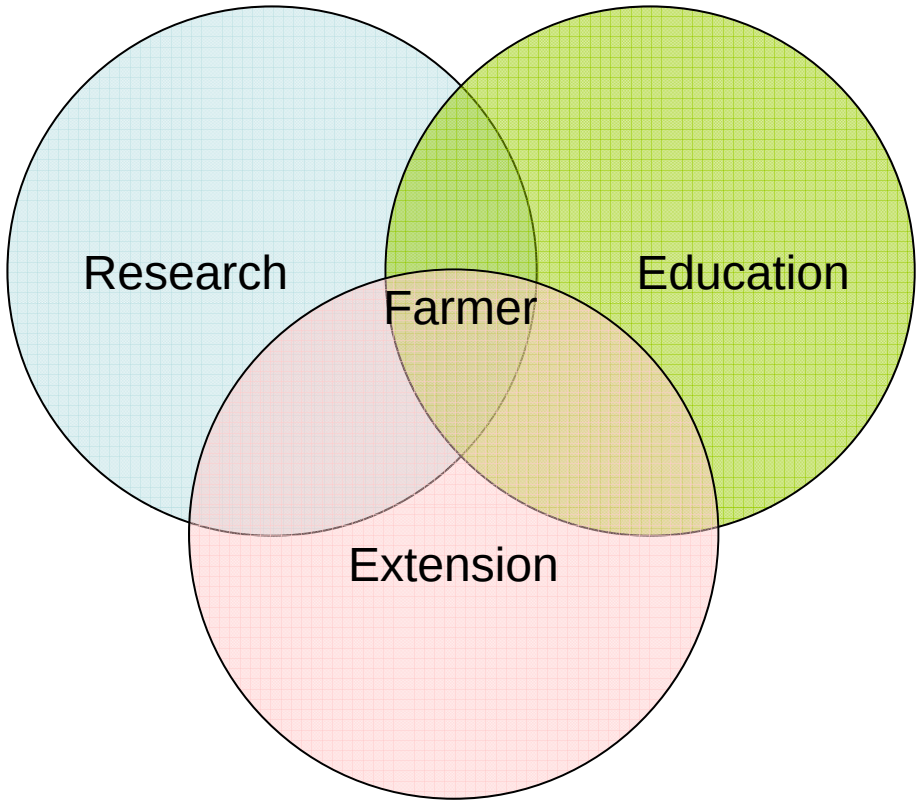
- Agricultural Extension & Research
- Agricultural Marketing & Trade
- Animal production
- Crops
- General Agriculture, fishing & forestry
- Irrigation & drainage

http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0,,menuPK:2204367~pagePK:51331374~piPK:2037597~theSitePK:295584,00.html
accessed on August 10, 2007

WB's lending in India from 1949 to 2006



Source: Compilation of Bank Information Centre's compilation, from their website



Knowledge, resources and practices that farmers had for farming in the country and community level organization & management of such resources and practices would not do to increase production

Agriculture Research and Education

Research

National Agricultural Research Project	1978
National Agricultural Research Project (02)	1985
Agricultural Human Resources Development Project	1991
National Agricultural Technology Project	1998
National Agricultural Innovation Project	2007
GEF Biosafety Project	2007

- **National Agriculture Research Project:** focused to strengthen the location specific research
- **National Agriculture Technology Project:** Increase availability and adoption of appropriate technologies
- **National Agriculture Innovation Project:** sustainable transformation of Indian agricultural sector to more of a market orientation

Agriculture Research-critical weaknesses

- Linear Knowledge flows: Research ⟶ Extension ⟶ Farmer
- Technology deterministic: Expertise has also been ‘transliterated’ into Technology
- Crop bias with major focus on rice and wheat, commercial crops
- Norms of evaluation: Research papers than well being of farming community
- In sensitive to grass root innovations and pluralistic approaches
- Inadequate emphasis on the needs of rain fed areas, which account for over 60 percent of cultivated area
- Weak accountability for performance
- Inadequate collaborative multidisciplinary research
- Weak interaction among researchers, extension workers, farmers,
- Excessive centralization of planning and monitoring

(Acharya 2002, Vaidyanathan 2002, ICAR 2002, Hanumantha Rao 2003)

Agriculture Education

- Lack of focus on the purpose
- Excessive bias towards urban students
  - Entrance test based admissions combined with Medical entrance in states like AP
  - Teaching in English
- Technology centric
  - Lack socio economic and political dimensions
- Unable to learn from real life situations (only RAWEP)
- Mostly tailored to work with input marketing

Agriculture Extension

Extension

Training and Visit System	1973
National Agricultural Extension Project (01)	1984
National Agricultural Extension Project (02)	1985
National Agricultural Extension Project (03)	1987
Diversified Agricultural Support Project (DASP)	1998

Training and Visit System: believed in trickle down approach
(Early 90's onwards) - decline

- External support dried up (post T&V)
- Restrictions on recruitments due to high operational costs (>85 % goes towards sala
- Extension staff with additional responsibilities,
- Obsession with technology dissemination
- Vacancies in remote and interior areas

Extension system- public sector (late 90's to date)

2 Major centrally supported (reform) programmes
1. ATMA 2. Agri-clinics and agri-business scheme

- Agricultural Technology Management Agency (ATMA) –WB funded NATP
  - Need to integrate functioning of line departments at the district level
  - Farmer advisors or representatives of farmers organisations to replace VLWs
  - Most material technologies and services were sold to the farmers on a cost recovery basis.
  - Further, farmers paid part of the training costs.
  - Pilot testing 1998-2005 –ATMA set up at 28 Districts / 7 states
  - Since 2005, model expanded to 268 districts with government funding

- Agri-clinics and Agri-business scheme-since 2003
  - Extension services on payment
  - Self employment venture (Modern Input Dealer)
  - Training and loans to set up enterprises 10503 trained, 3000 set up

- Extension is a state subject-initiatives are lacking

Re energizing Agriculture Sector

- Smaller, higher quality, more agile public sector research system
- Rigorous priority-setting exercise to ensure resource allocation to drive the future agricultural growth and diversification agenda
- Reallocation from crop production research (especially in high-potential irrigated areas) to
  - marketing policy,
  - post-harvest technologies and practices,
  - livestock and high-value commodities with strong market demand, and
  - cost-saving technologies

India Re-energizing the Agricultural Sector to Sustain Growth and Reduce Poverty (2004)

The Four New Manthras
for agriculture growth and development

- **Intensification:** increasing the output of existing activities
- **Diversification:** shift in production to higher-value crops or products
- **Non Farm Linkages:** to activities that foster greater value addition
- **Exit:** shift away from farming to non agricultural occupations.