IWMI International Water Management Institute

CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

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IWMI-TATA Water Policy Program

| Rural India: Blossoming in Neglect? | BAIF Campus, Pune | 30th August, 2018 |

Managing the Water-Energy-Livelihood Nexus

Glimpses from 18 years of ITP Research in Eastern India

Defining Features…

- *Largest concentration of poverty outside SSA*
- *Tribal Uplands*
  - *Jharkhand, Orissa, Hilly N-E*
  - *Low population density*
  - *(relatively) High land availability pc*
  - *First-generation farmers*
  - *High rainfall; Untapped water resources*
  - *'Tribal Deprivation'*
- *Fertile Floodplains of GBM basin*
  - *Eastern UP, Bihar, W. Bengal, Assam*
  - *High population density*
  - *Stamp-sized land parcels*
  - *Recurring floods*
  - *High rainfall; Excellent aquifers*
  - *Economic water scarcity*

ITP: Irrigation and Agrarian Impasse…

- *Agrarian Impasse in Bihar*
  - *Alternate hypotheses…*
  - *Land to Groundwater*
  - *High TW Density, Low Utilization*
  - *Farm Power provision…*
- *Scarcity among Plenty in WB*
  - *Abundant aquifers, Under irrigation*
  - *SWID Certificates; Depletion Obsession*
  - *Monopolistic Water Markets*
  - *Farm Power provision…*
- *Floods and Tanks in Eastern India*
  - *Often ignored in tank literature*
  - *Floods, Ahar-Pyne Systems*
  - *Ganges Water Machine…*

Understanding Agrarian Impasse in Bihar

The key hypothesis of policy-makers during the 1980s was that raising tubewell density would trigger agrarian upsurge in Bihar as it did in Punjab, Haryana and western UP. The state did record high growth rates of cereal yields during the 1980s, higher than the national figures. However, this promising development could not be sustained in the 1990s, and cereal yields have stagnated since then. Based on fieldwork in eight villages of Bihar, the paper argues that, more than agrarian structure, the lack of adequate infrastructure and economic incentives has contributed to the agrarian stagnation in Bihar. The growth potential unleashed by the expansion of shallow tubewell irrigation has been constrained by (a) complete neglect of public sector investments in physical and institutional infrastructure and (b) unfavourable output to factor price ratios.

AVINASH KISHORE

I Introduction

After a century-long stagnation, agriculture in eastern India experienced a turn around in 1980s with rapid ground-water development. Especially, West Bengal and eastern Uttar Pradesh performed very well with growth rates in production becoming as high as 4-6 per cent during 1981-82 to 1991-92. Agricultural production and productivity levels in the 'middle state' Bihar also witnessed a growth higher than the long-term growth trend of the state [Pandey and Pal 2000]. Yet, agriculture in the state grew at a slower pace, over a smaller bas… time after which the momentum was lost in spite of … expansion of tubewell irrigation.

This paper tries to explore the reasons for this … first section of the paper presents a review of litera… from the existing body of research on reasons for … agrarian stagnation in eastern India. The second se… the latest trends in tubewell irrigation and discusse… of water markets and their productivity and equity … based on data from a primary survey. The third … paper discusses various macroeconomic factors … farmers' ability to leverage the newly created pu… increase crop productivity and raise incomes. This … is based on the knowledge of larger reality of agricu… in Bihar and observations from field survey. The … concluding section discusses various alternative … crops yield and farm incomes based on studies of we… farms in the region.

II Methodology Used in Study

The study involved an extensive review of litera… on issues of agrarian structure and production rela… rural growth, groundwater development and wat… eastern India and primary data collection using f… discussions and interview schedules.

The primary data were collected from field studi… in eight villages from six districts of Bihar in 200… villages are from Nalanda and Bhabhua districts … while the rest six are from districts, viz. Muzaff…

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Gopalganj, Darbhanga and Madhubani in north Bihar. While Darbhanga and Madhubani are agriculturally least developed, Nalanda and Bhabhua are agriculturally the most developed districts. Muzaffarpur, Saran and Gopalganj fall in between these two extremes. This paper is an attempt to distill the lessons learned during the fieldwork in these eight villages and put them in perspective of the larger reality of agricultural development in Bihar.

III Literature Review

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Comment

Groundwater Development and Agrarian Change in Eastern India

Aditi Mukherji

Based on Research by
Vishwa Ballabh
Kameshwar Choudhary
Sushil Pandey
Sudhakar Mishra

Notwithstanding the huge potential in terms of fertile soils, groundwater reserves, and rich peasant tradition, eastern India is characterized by low agricultural productivity, backwardness, and poverty.

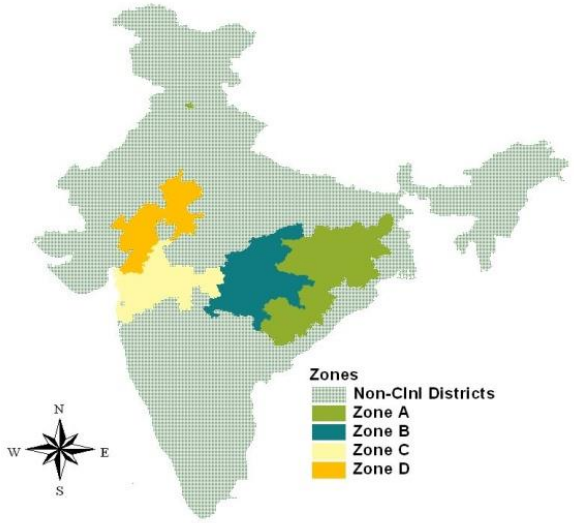
Groundwater development can transform the stagnant east Indian agricultural economy into a vibrant one, with positive productivity and equity impacts. However, due to a multitude of policy differences coupled with varying agrarian structures, the beneficial impact of groundwater has not been realized equally across the region.

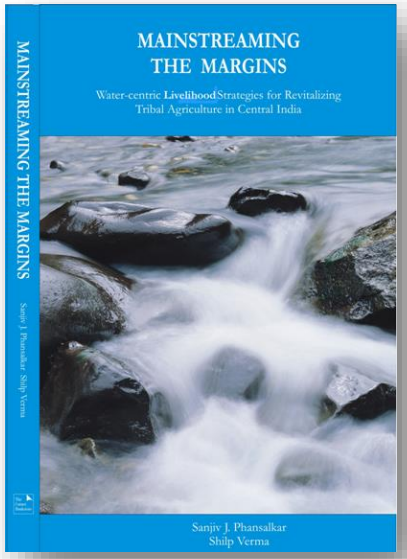
A few policy level changes can go a long way in unleashing an unprecedented boom in the emerging groundwater based agrarian economy in eastern India.

Download this paper from
http://www.iwmi.org/iwmi-tata

ITP: Water and Tribal Livelihoods…

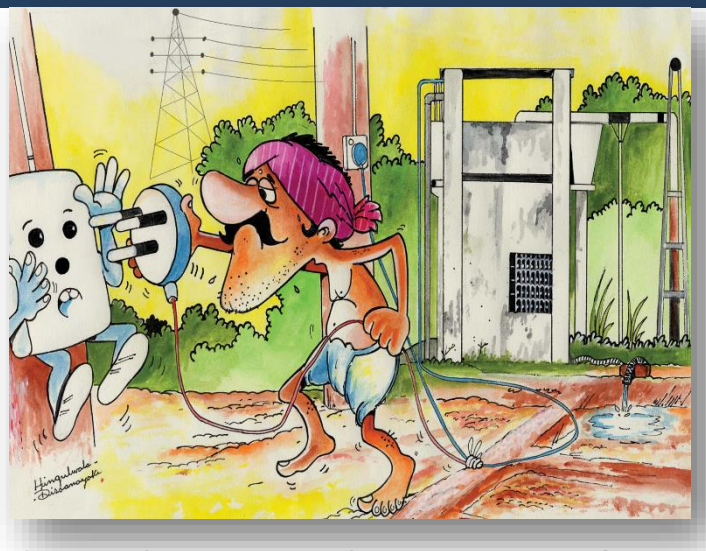
- *Central India Initiative (CInI)*
  - *Central Indian tribal heartland*
    - *Dahod to Dumka*
    - *Sadguru, AKRSP, BAIF…to PRADAN*
  - *Contours of Tribal deprivation*
  - *'Water Control' strategies*
  - *Kharif Paddy Stabilization*
  - *Appropriate technologies – pumps*
  - *Water-centric Tribal Livelihoods*
- *Beyond the Chicken's Neck*
  - *North-East India Initiative (NEInI)*
- *SRI for Tribal India*
  - *Bundle of best practices*
  - *Less water, but More 'water control'*



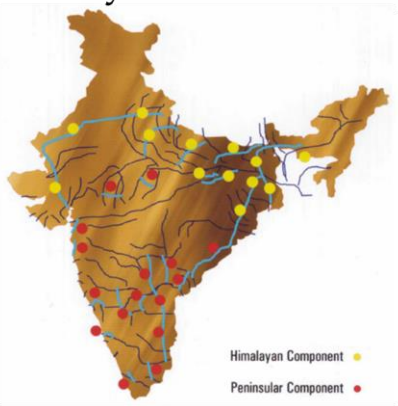


ITP: E-I Nexus and VW Trade

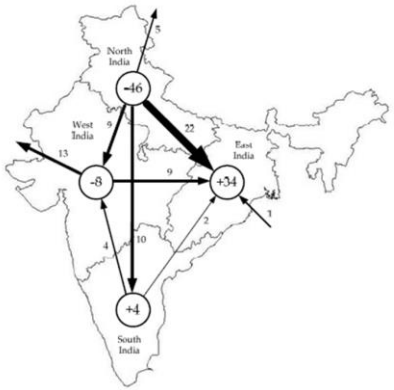
- *Managing the E-I Nexus*
  - *Energy Divide*
  - *East-West Contrast*
    - *Full irrigation vs. Deficit irrigation*
    - *Demand for farm power subsidies*
  - *Flat Rate, Universal Metering*
  - *Temporary Farm Power Connections*
- *Perverse VW Trade and NRLP*
  - *Public discourse on NRLP*
  - *Domestic deficits and surplus*
  - *Water scarce India exporting VW*
  - *Water abundant India importing VW*
  - *Physical abundance, Economic scarcity*



Physical vs. Virtual Water Transfers…



- 178 x 10^9 m^3 p.a.
- Water Abundant TO Water Scarce



- 106 x 10^9 m^3 p.a.
- Water Scarce TO Water Abundant!!

ITP: Second Green Revolution

- *Second Green Revolution*
  - *Pump re-electrification*
  - *Mimicking High-FR regime*
  - *Boro and Summer Cultivation*
  - *Potential role for 'Solar' in E. India*
  - *Competitive, Equitable Water Markets*
- *Irrigation Deprivation and PMKSY*
  - *India's unirrigated half*
  - *Density of irrigation infrastructure*
  - *Utilization of irrigation infrastructure*
  - *PMKSY 2.0 (GW)*
  - *Delivering 'Har Khet ko Pani'…*

This Session…

Speaker	Title
Shilp Verma (Consulting Researcher, IWMI)	Managing the Water-Energy-Livelihood Nexus in Eastern India
Satyendra Nath Mishra (XIMB, Bhubaneshwar)	Challenges to the Natural Resource Management at the Shirui Village in Ukhrul district, Manipur
Anil Verma (PRAN, Gaya)	Impact of principles of System of Root Intensification method of Crop cultivation in Paddy crop grown in Gaya, Bihar
Nirmalya Choudhury (TISS, Mumbai)	Development Profile of Flood Prone Areas in Eastern India
Manisha Shah, Sujata Das Chowdhury Tushaar Shah (IWMI-Tata Water Policy Program)	Pro-poor Farm Power Policy for West Bengal
Gyan Prakash Rai , Anup Kumar , Rohit Goel (IWMI-Tata Water Policy Program)	Catalyzing solar irrigation market in North Bihar
Bikalp Chamola (Vikasanvesh Foundation, Tata Trusts)	Small Pumps Big Hopes: An exploratory study to understand the role of small irrigation pumps in enhancing incomes of small and marginal farmers in eastern states of India
Victor Lesniewski (Khetworks)	Small Pumps, Big Risks: Testing Prototypes and markets for and with smallholders in East India
Abhishek Rajan (IWMI-Tata Water Policy Program)	Implementing PMKSY in India's Eastern Geography

Some Issues to Flag…

- *Tenancy, Land Leasing*
  - *Myriad rental market configurations*
  - *Impact on input intensification*
  - *Fair share of 'Land' as factor of prod.*
- *Ag+ Allied Sector in Eastern India*
  - *SFPF opportunities in Eastern India*
  - *Regional imbalance in dairy development*
  - *Poultry, Fisheries…*
- *Water Quality and Health*
  - *Arsenic in Groundwater*
    - *Links to GW Irrigation*
    - *Water Quality and Health*
  - *Sanitation and Floods; Urban floods?*
  - *'Swachh Bharat' and Shallow Aquifers*

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