PRO-POOR FARM POWER POLICY FOR WEST BENGAL

Results from ITP’s experiment in Birbhum district

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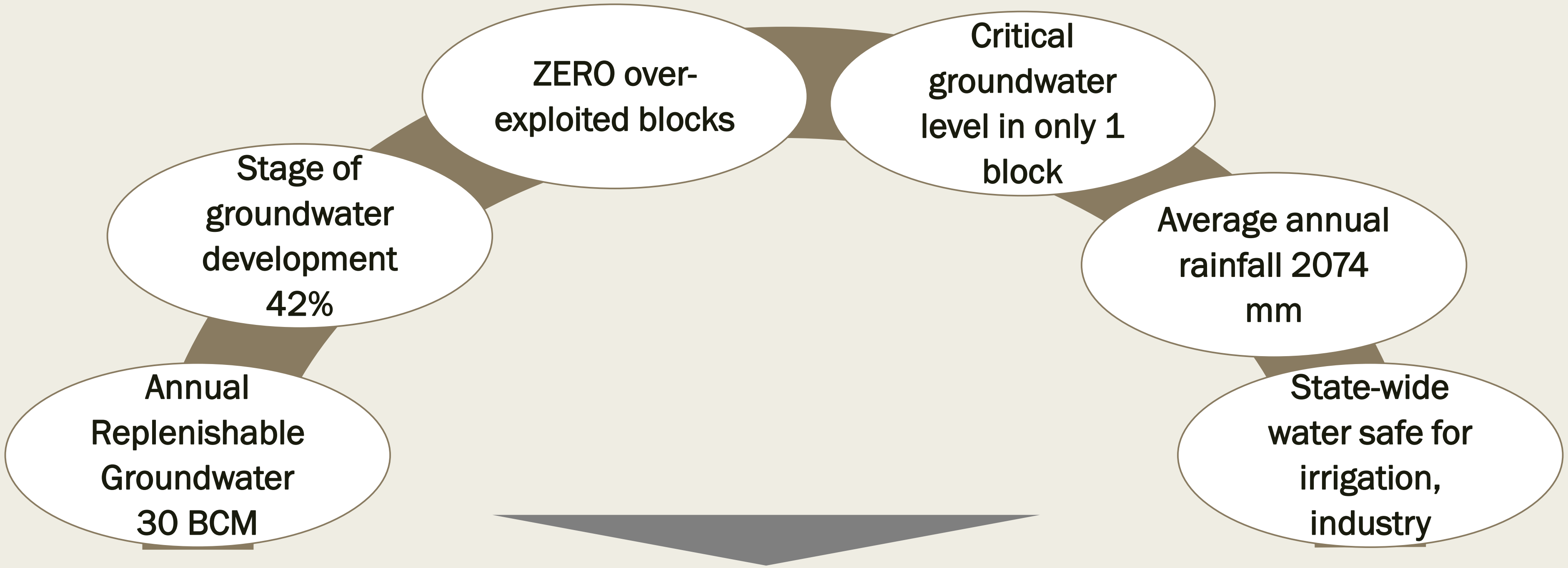
IWMI-Tata Water Policy Program

Groundwater Scenario*



Except for 1 critical and 37 semi-critical blocks, the remaining 215 blocks are groundwater safe.
On an average, every meter of pre-monsoon water drawn recovers by 0.83 m after monsoon.

*based on CGWB state report 2014-15

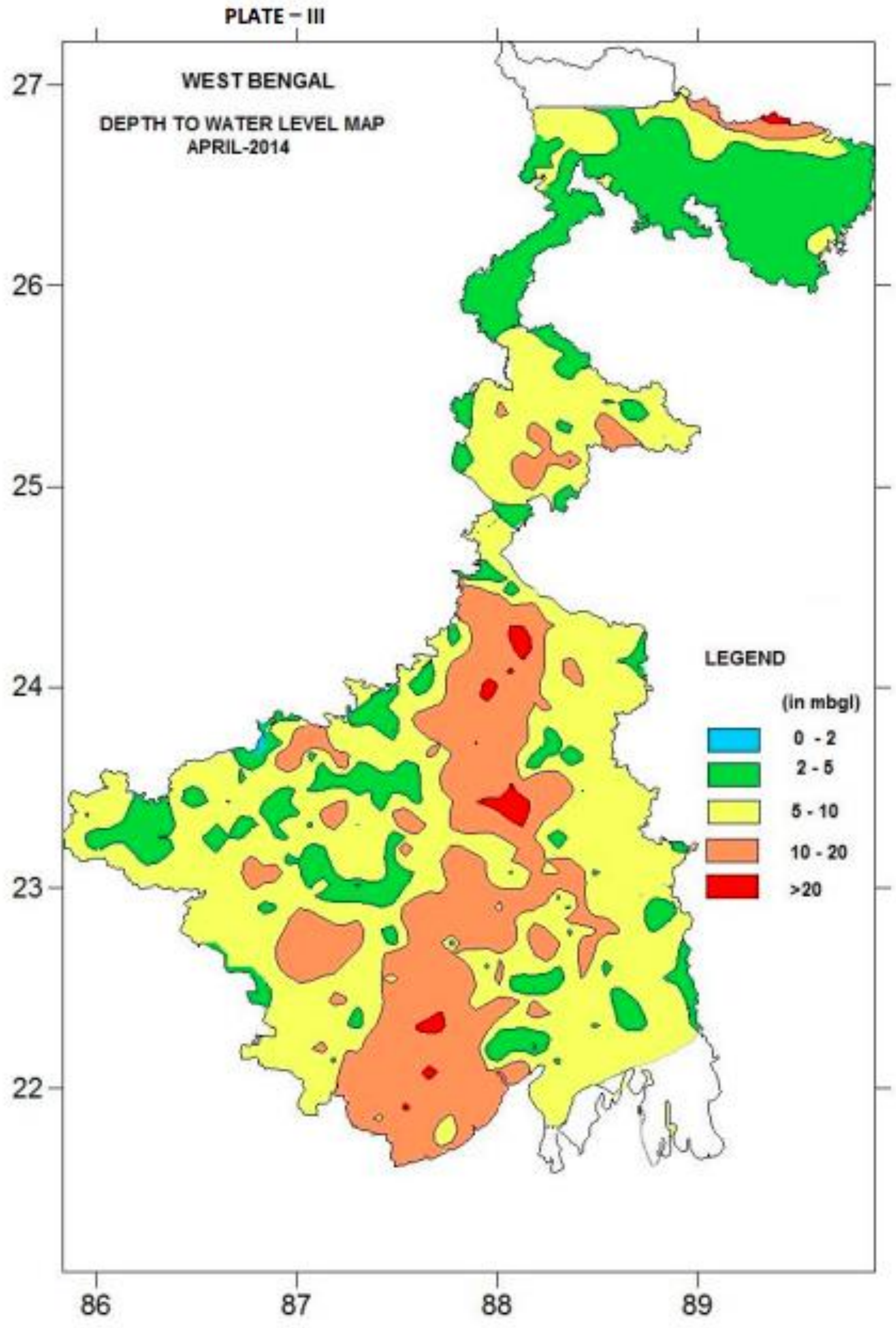


PLATE – III
WEST BENGAL
DEPTH TO WATER LEVEL MAP
APRIL-2014
LEGEND
(in mbgl)
0 - 2
2 - 5
5 - 10
10 - 20
>20
27
26
25
24
23
22
86
87
88
89

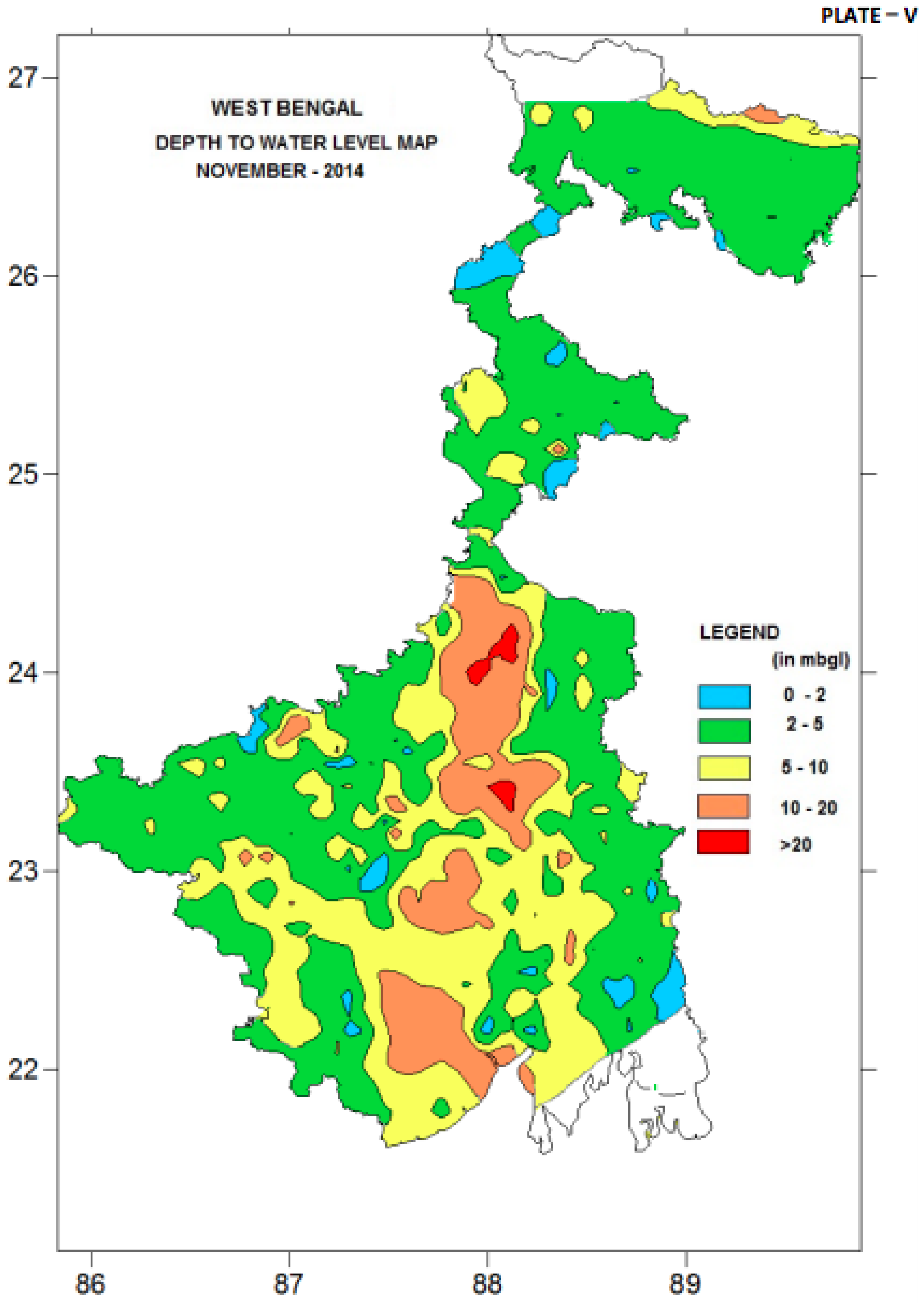


PLATE – V
WEST BENGAL
DEPTH TO WATER LEVEL MAP
NOVEMBER - 2014
LEGEND
(in mbgl)
0 - 2
2 - 5
5 - 10
10 - 20
>20
27
26
25
24
23
22
86
87
88
89

Evolution of Groundwater Irrigation and Power Policies

1980-1990

- Poor state of rural electrification
- 6% annual growth rate of agriculture using diesel STWs

1990-2005

- Rapid rise in diesel cost increasing irrigation expenses
- Deceleration of agricultural growth to 1.2-2 per cent
- Flat tariff on existing connection– buyers' market – Tariff INR 1100/year

2005-2008

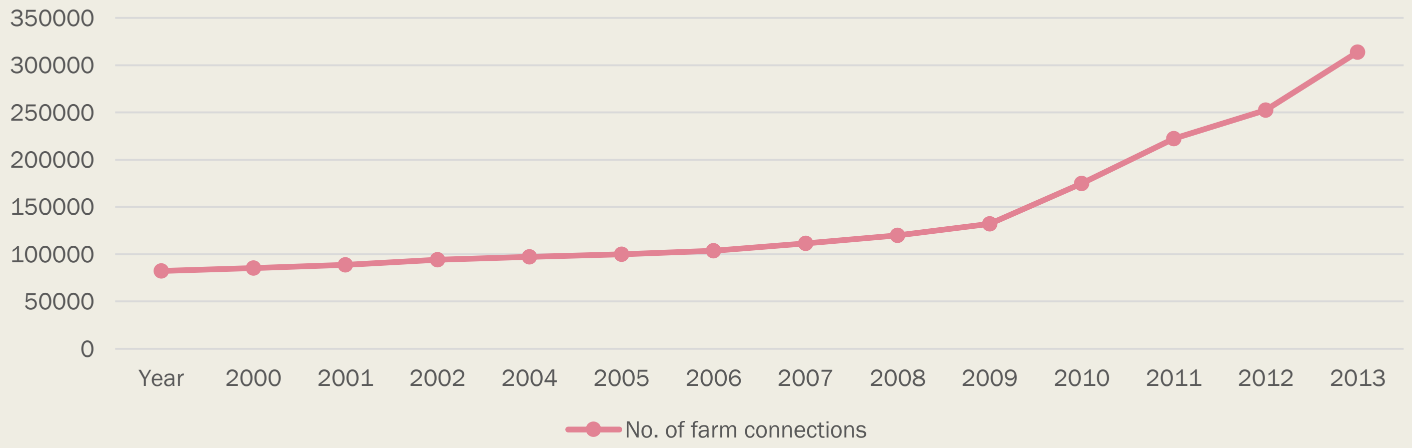
- Groundwater Act 2005 -difficult and expensive to get a new farm connection (Permit system)
- Flat tariff rate 10X of 1991 rates (at INR 10800/year)

2008-2011

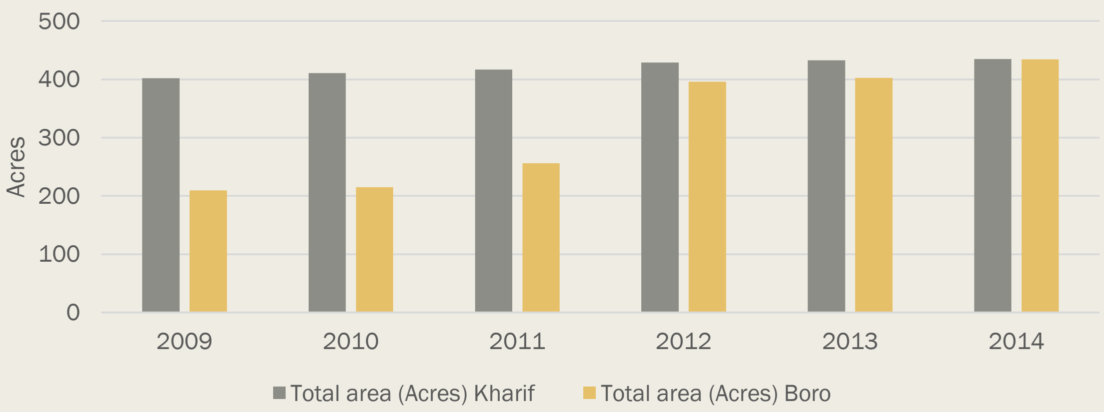
- Flat tariff was changed to metered connection
- Buyers' market changed to sellers' overnight

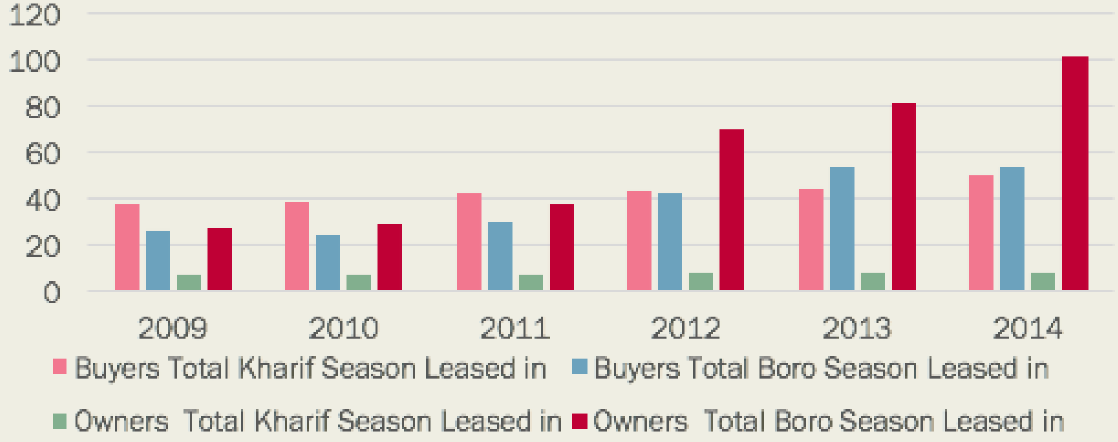
2011-2018

- Permit system abolished, pump density increased
- Irrigation services markets continue to be oligopolistic



Impacts of Permit Liberalisation in 2011





Increase in area under *Boro* crop

Increase in area leased in by pump owners in *Boro* season

Linkage between land leasing and irrigation access

Near commercial rates charged to farm consumers

Farm Power ToD Rates (in Rs/kWH)*				Other Rural Power Tariff	
Time Window	6:00 – 17:00	17:00-23:00	23:00 – 6:00	Domestic	Commercial
ToD Metered	3.78	7.48	2.42	Rs 5.26 (first 102 units) to Rs 8.99 (above 900 units)	Rs 6.17 (first 180 units) to Rs 8.94 (above 900 units)
Prepaid ToD Metered	3.68	6.88	2.79		

*in addition to this, a fixed charge/demand charge of Rs. 20/kVA per month is levied per connection

Issues in Current Situation

- High water prices (up to INR 1500/acre in *Kharif*, INR 5000/ acre in *Boro)*
- Irrigation-Land leasing markets linkage
- Unfettered monopoly of pump owners
- No room for negotiation for buyers

Squeezing Profits from Agriculture for Small and Marginal Farmer Water Buyers

- Declining interest in *Boro* paddy cultivation
- Perverse incentive to pilfer power from overhead cables to run pumps
- High transaction cost of billing to utility
- Repressive for pump owners who cannot pay high bills during bad crop years

Positive impacts of permit liberalization and pump density increase was nullified through metering

Hypothesis

Metered connection

Change in tariff structure

would lead to

Flat-cum-metered

Reduce water prices	Increase bargaining power of buyers	Expand *Boro* and Rabi cultivation
Reduce power pilferage	Increase efficiency of irrigation	Reduce pressure on buyers to lease out land

Experiment Design

• Monoharpur in Birbhum district	• Kendradangal in same block
Study Village	Comparison Village
Sample in study village	Sample in Comparison Village
• All 20 pump owners (ISPs) and 279 water buyers surveyed (census)	• 20 ISPs and 100 water buyers randomly selected

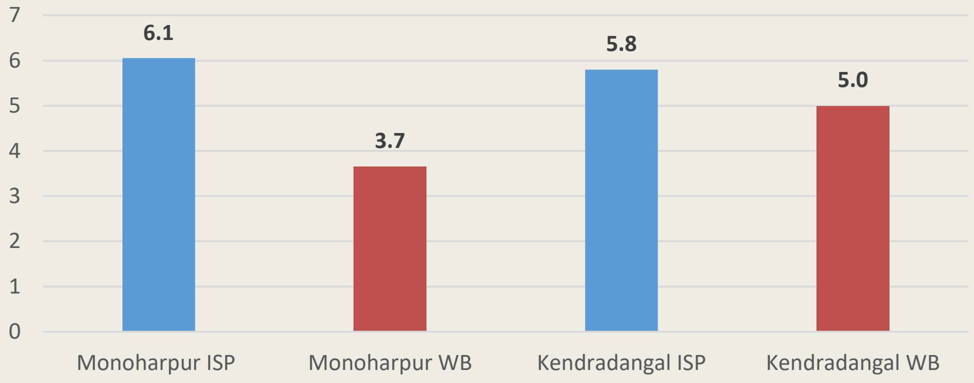
Data collected at baseline in June 2017 and at the end of one year in May-June 2018

TARIFF STRUCTURE

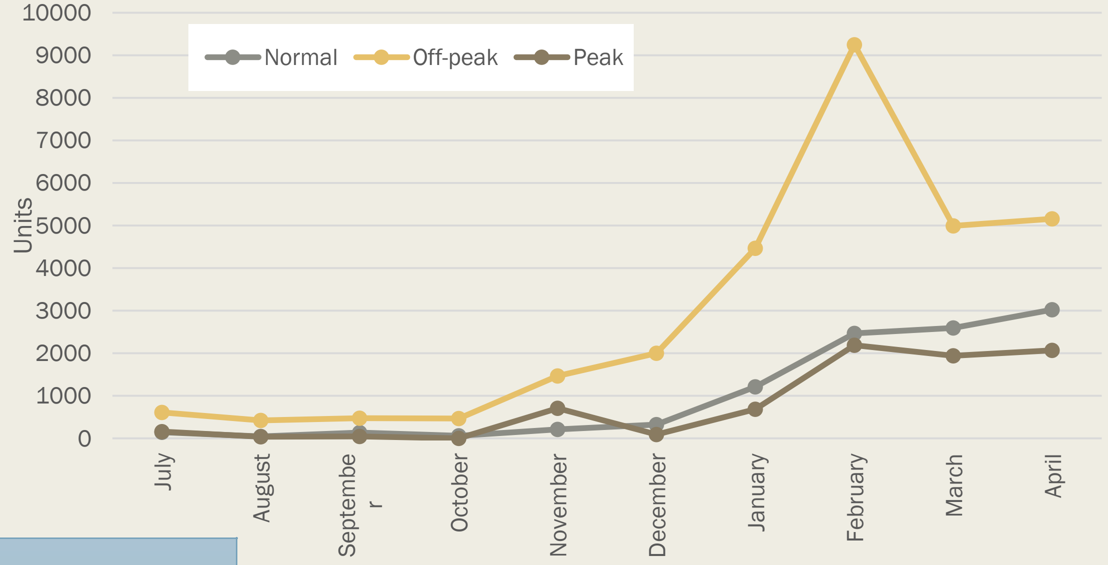
Energy consumption data of all 20 ISPs obtained for year 2016-17 and average monthly consumption taken us flat tariff

Every unit consumed after bill crossed the monthly flat tariff subsidized by 70%

Conditions at Baseline



Family Size



Parameter	Irrigation Service Providers		Water Buyers	
	Monoharpur (20)*	Kendradangal (20)*	Monoharpur (240)*	Kendradangal (100)*
Own irrigated landholding	187.75	308.50	592.75	391.75
Total Amon Area	190	334	583.45	480
Total Boro Area	208.25	379	378.25	389.5
Total Rabi Area	6.00	4.50	27.58	7.00
% of owned area leased-out (Boro)	0%	0%	25%	7%
Average size of plot	4.33	2.88	1.30	2.08
Average landholding of a household	10.90	14.70	2.47	3.95

*2.5 bigha= 1 acre

Season	Rental charges reported by ISPs (₹/bigha*)	
	Average	Maximum
Boro	1526	2000
Kharif	405	600
Rabi	600	700

Water buyers are invariably small and marginal farmers

Challenges During the Course of Study

Mini-Barga Disruption

Conversion of Cables

West Bengal State Electricity Distribution Company Ltd.
(A Government of West Bengal Enterprise)
BILL (Domestic / Commercial) - Internet Copy -

WBSEDCL SHANTINIKETAN CUSTOMER CARE CENTER, PHONE No - 03463-252544(24 HRS)
BOLPUR, CALL CENTER PHONE No -18003453201 (TOLL FREE)

SAMSUR RAHAMAN	Invoice No : 498001589371
S/O-MUJIBOR RAHAMAN	Prev. Read Date : 29.03.2018
KENDRA DANGAL,P.O-SATTOR,P.S-P	Cur Read Date : 28.04.2018
KENDRA DANGAL,P.O-SATTOR,P.S-P	Billing Date : 29.04.2018
Pin - 731236	Next Reading Date:16.05.2018-20.05.2018
ConsumerId : 500102178	Bill Month : MAY,2018
Business Partner: 2561799	Connected Load : 4.39 KVA
Tariff Class : C(T)	LEGC-GIS Pl No:NA-NA
Installation No : 2380820	Meter Reading unit : FTS21MMR

Latitude :
N/A

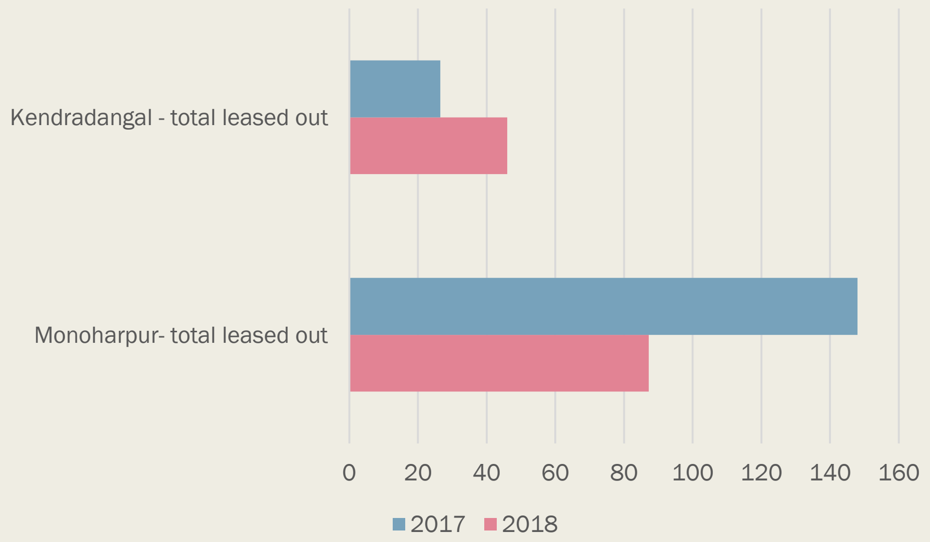
Meter No	Time	Previous Reading	Present Reading	Multiplying Factor(MF)	Unit consumed	Max Demand (KVA)
LX010592	N	573.00	1363.00	1.00	790.00	
LX010592	P	360.00	611.00	1.00	251.00	3.73
LX010592	O	460.00	692.00	1.00	232.00	3.73

Breakup of Charges	Amount (Rs.)		
Energy Charge	5425.12	Total Charges (Rs)	5830.71
Fixed/Demand Charge	87.80	Timely Payment Rebate(Rs.)	58.05
Rental Charge	25.00	Due Date	10.05.2018
Electricity Duty Charge	0.00	Amt Due within Due Dt(Rs.)	17946.00

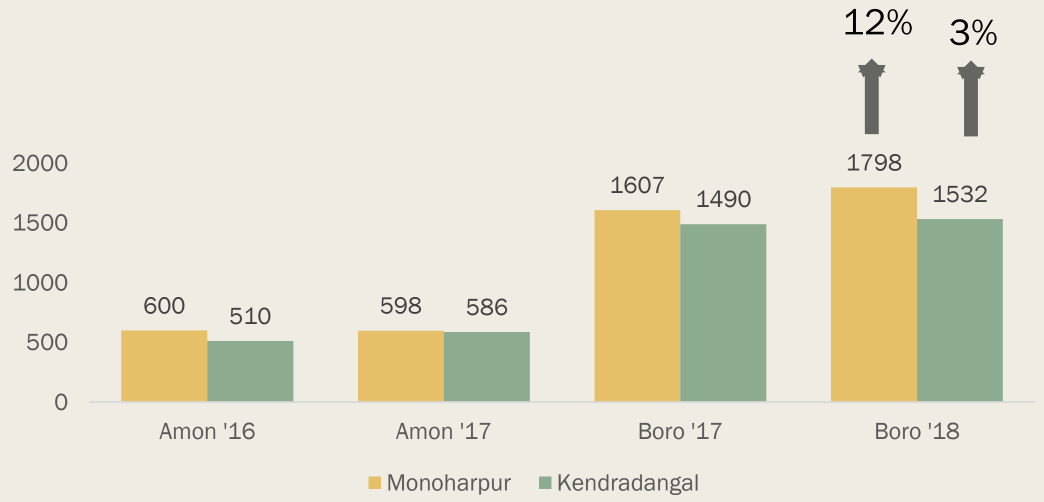
Irregular billing

RESULTS AT THE END OF ONE YEAR

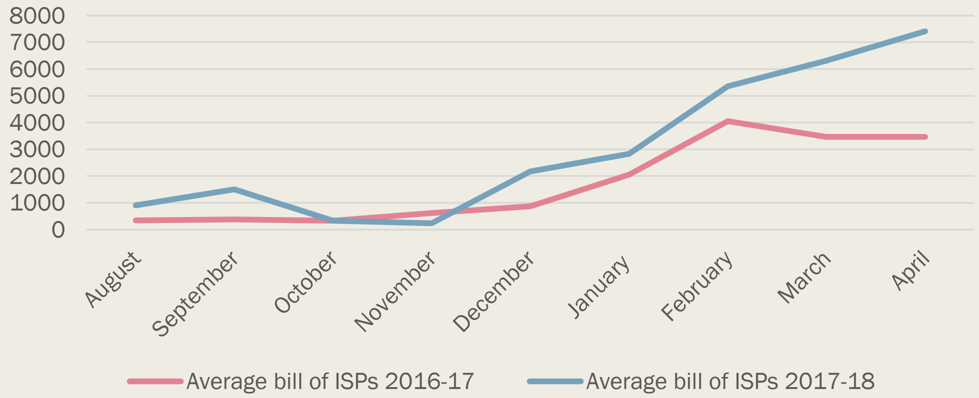
Land leasing, Pump Usage and Water Prices



Land leased in study and comparison villages



Water Prices in Kharif (*Amon*) and *Boro* seasons



Power billed in base and study years

Reasons for ‘sticky’ prices

Inability to create competition

Benefit as a group

- Price set by ISPs with more number of pumps in the area
  - Same price followed by all adjacent villages
    - Gain by following such monopolistic pricing is higher

Subsidy won’t last forever

- Knowing it as a year-long pilot
  - Not enough motivation to break their informal institution
    - Also would open them for negotiation next year

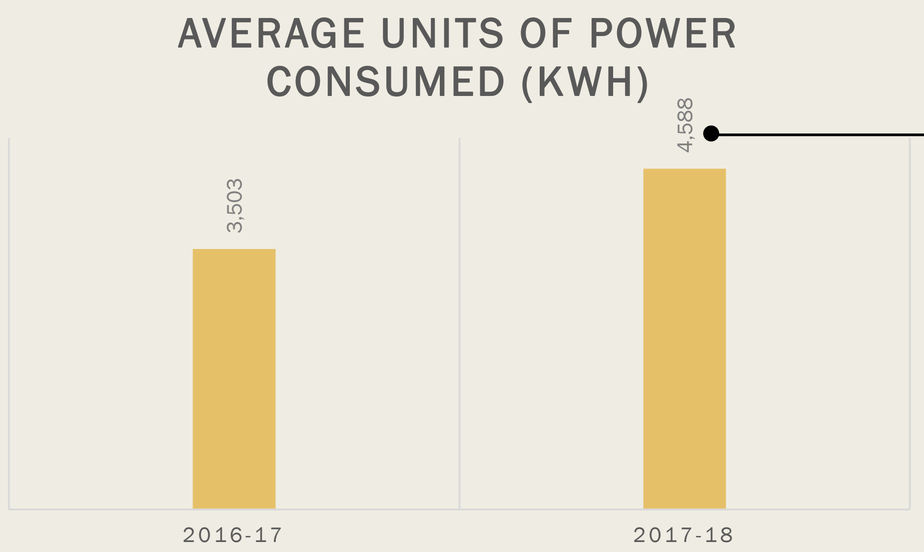
Poor payment frequency of buyers

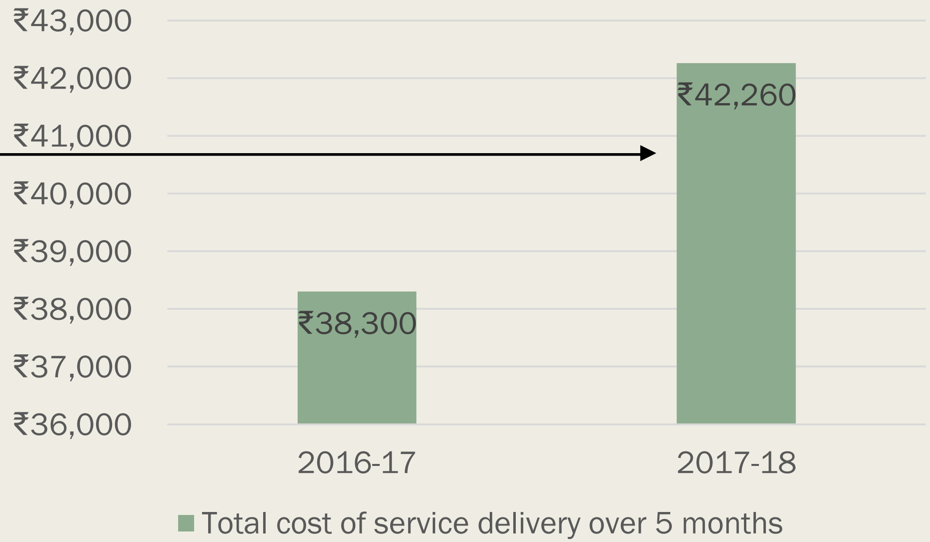
- Buyers fail to pay on bad crop years
  - High transaction cost of payment collection
    - Adds to their penalties

Informal agreement with neighbors

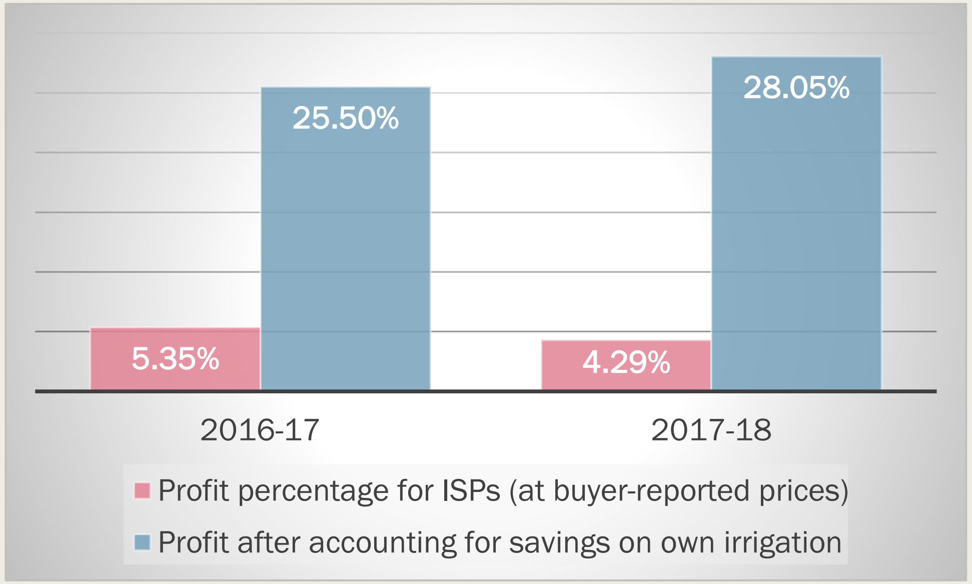
- Area of each ISP set at time of pump installation
  - No encroachment
    - Threatens their investment on pump and connection

Calculation of ISPs' Boro Profit Margin

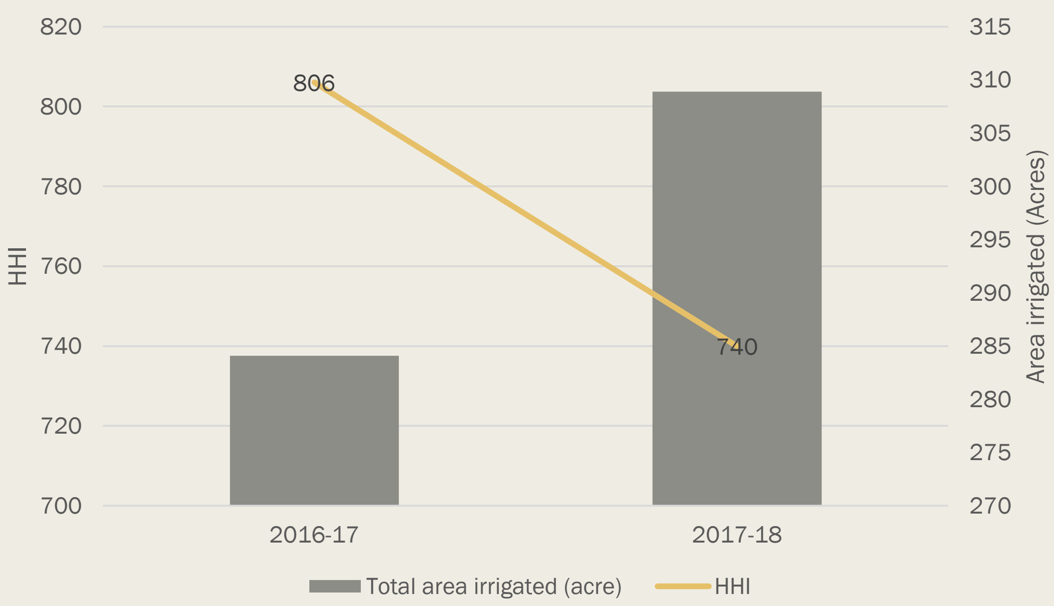


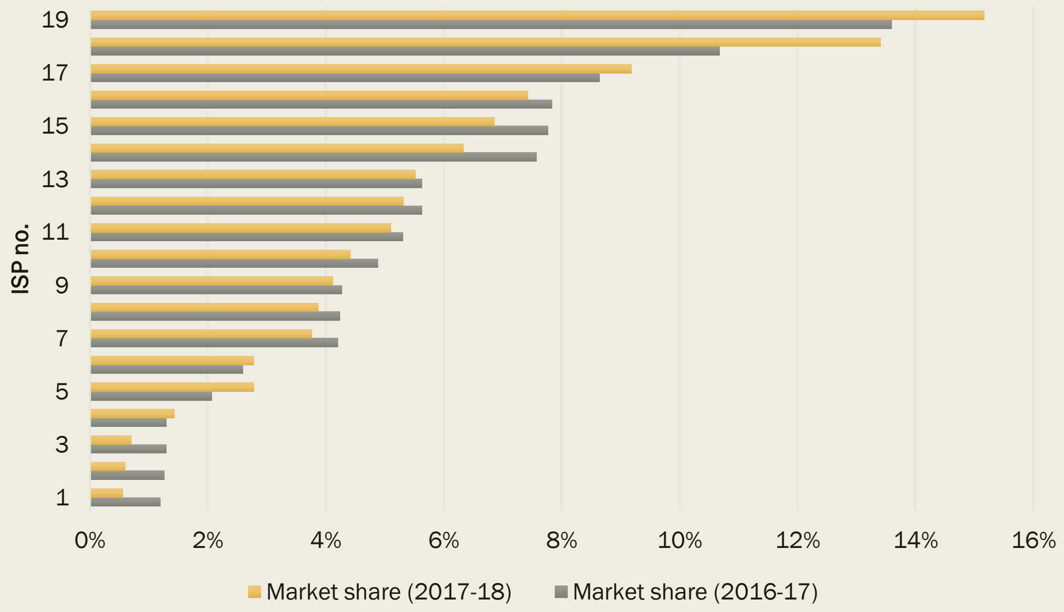


Total Subsidy Paid- ₹1,35,927



Market Characteristics



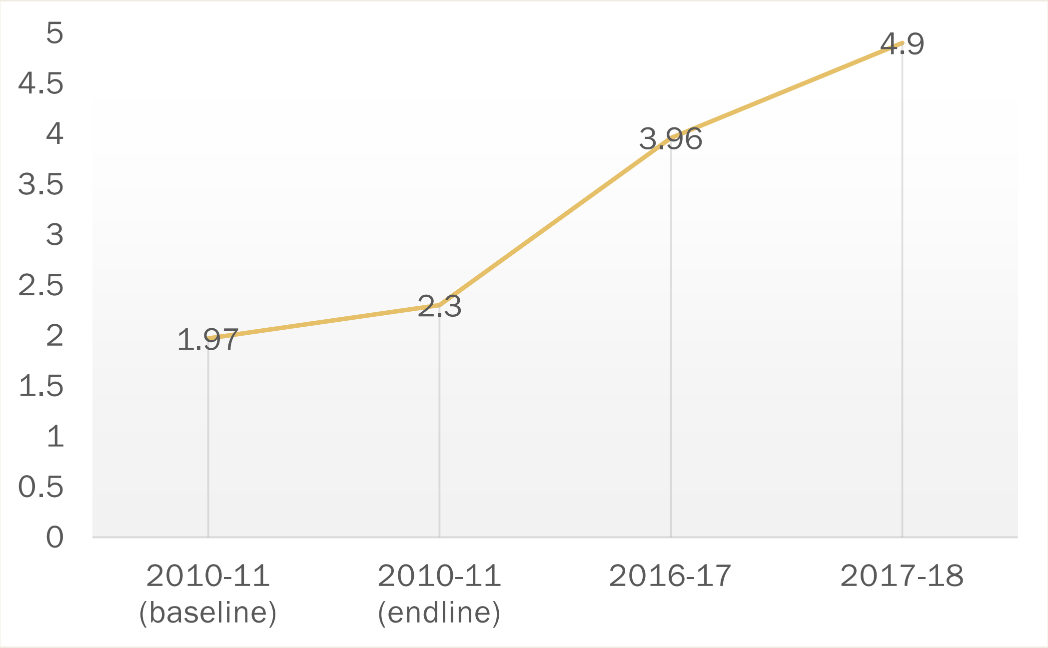


Increase in gross irrigated area of water buyers by 8.7%

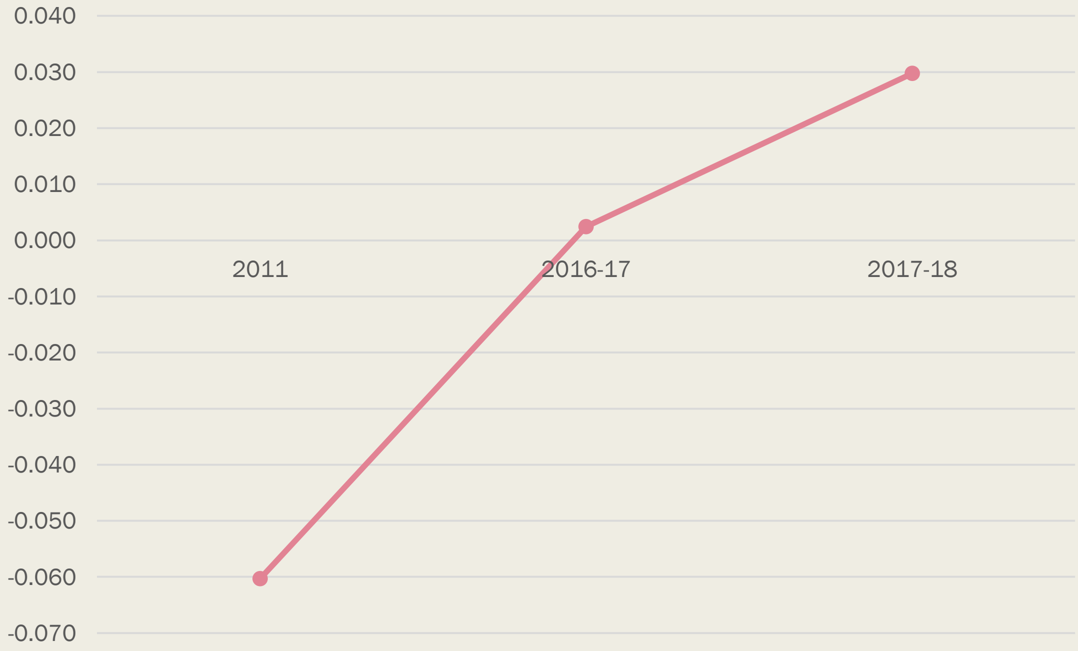
Herfindahl–Hirschman Index (HHI) dropped by 66 points towards competitive

Movement of individual market shares of ISPs towards group avergae

Service Quality

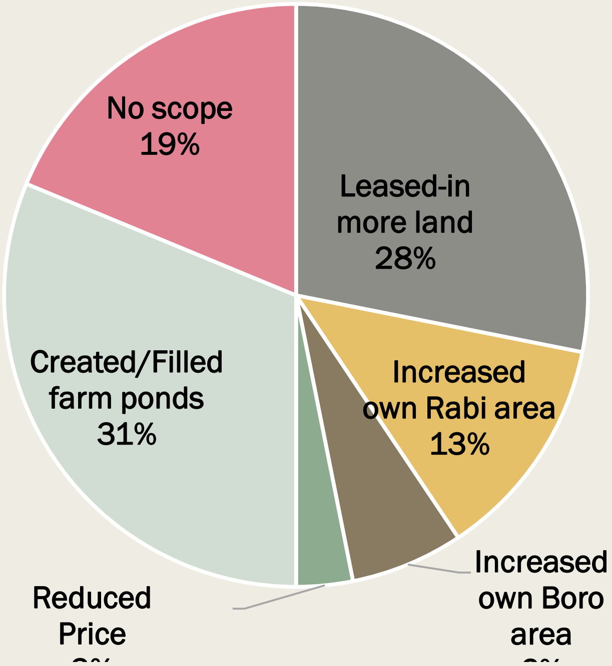


Service Quality rated by water buyers on a scale of 1 to 5 (1 being poor and 5 being excellent)

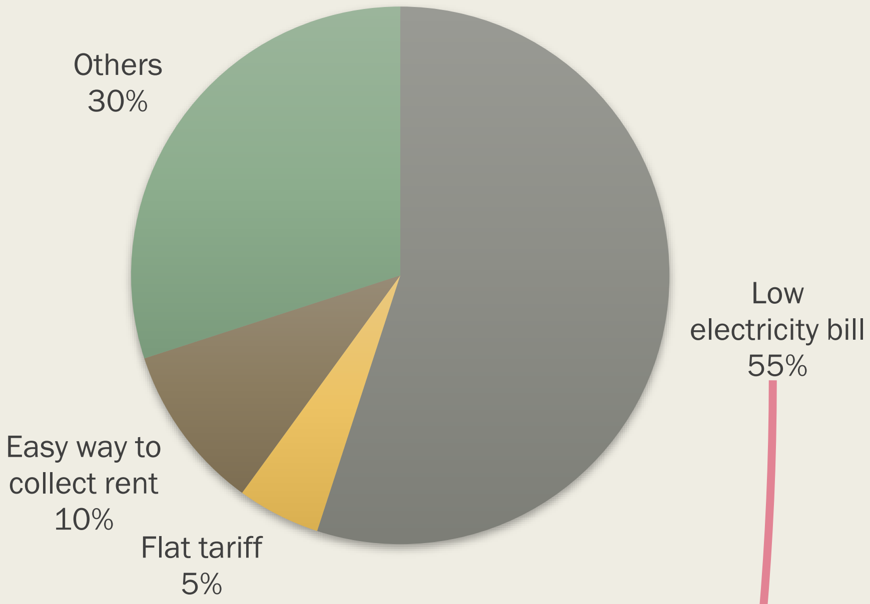


Competition- Quality Correlation
Competition calculated as number of ISPs who can service the plot

ISPs' Side of the Story



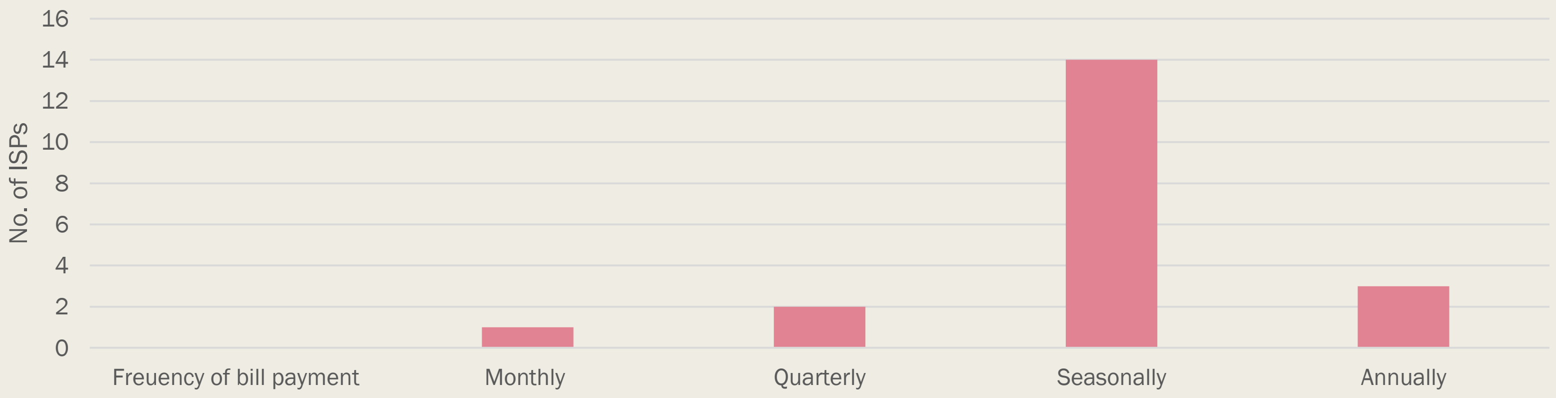
Utilization of Subsidy



Motivation factors to sell more water

15-30% of total outstanding was found to be Late Payment Surcharge (LPSC)

Irrationality of LPSC



Frequency of bill payment of most pump owners
is seasonally, i.e. after harvest

Utility generates bill based on average consumption

Actual reading taken only at end of season

Irrational to charge pump owners huge penalties

Billing farm connections seasonally saves billing costs of utility and LPSC of pump owners

Proposed Tariff Change

Advance flat charges covering certain fixed units
At INR 5/unit

+

Seasonal meter reading at INR 5.10/unit

Current annual revenue of utility per connection
INR 16,405

Cost to serve 1 unit of power
INR 4.18
Amount recovered per unit from farm consumers
INR 4.07

Utility

- 25% higher revenue/unit
- Reduced metering cost
- Reduced NPAs and defaults

ISPs

- Lowered uncertainty of bill amounts and LPSC
- Advance collection from buyers
- Motivation to increase efficiency
- Ease of price setting
- Expansion of aquaculture and rabi irrigation

Water buyers

- Increased bargaining power
- Ability of negotiate prices in Amon
- Bargain better leasing rates
- Better irrigation services

A Sample Tariff Structure for Districts Growing Paddy in Both Seasons

Flat charges in Kharif season (June-November)	₹ 2,500
Units covered under flat tariff in Kharif	500
Flat charges in Boro season (December-May)	₹ 20,000
Units covered under flat tariff in Boro	4,000
Assured annual revenue for utility per connection	₹ 22,500
Per unit charge beyond covered units	₹ 5.10
Revenue from an ISP at Monoharpur at current consumption rate	₹ 40,350
Savings in metering cost (from 12 times to twice a year)	83.4 %

De-linking Water Prices in *Amon* with Land Leasing in *Boro*

→

Increased bargaining ability of small farmers for leasing rates

Questions and Feedback Please.