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TF-13: Public Private Partnerships for Water Finance

PPP in Irrigation and Drainage Sector in India – Progress, Issues, and Prospects

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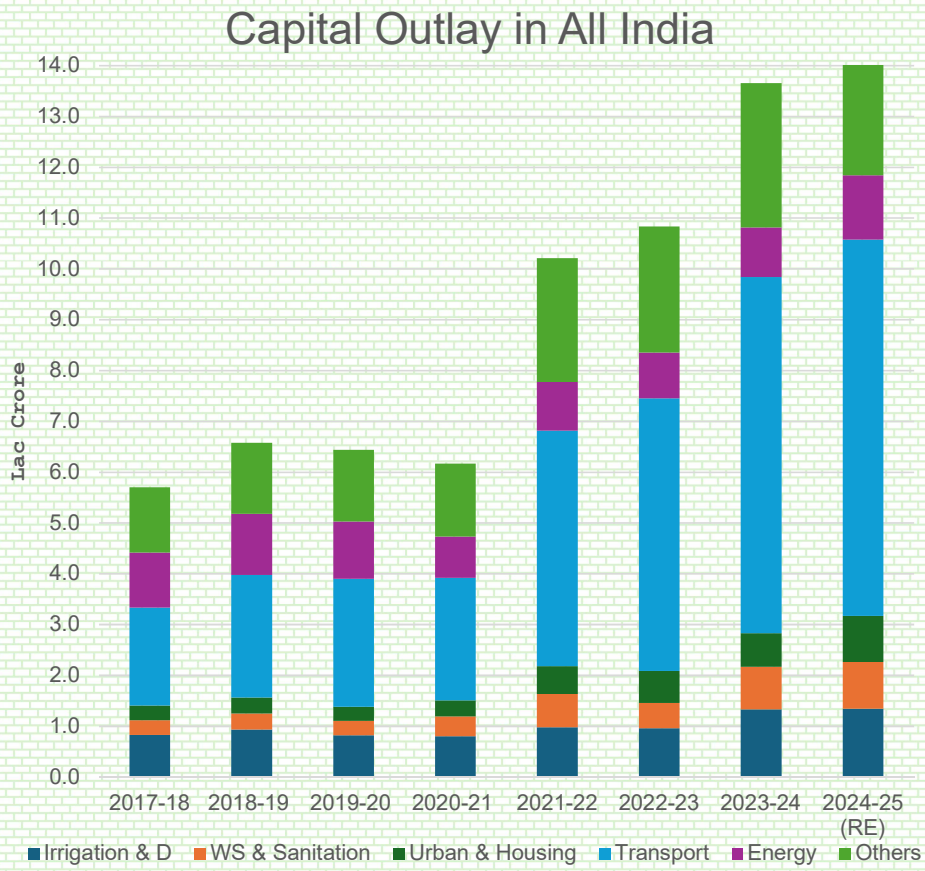


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A. India's Capital Outlay and PPP

- Rapid increase in capital outlay; ambitious PPP prospects next 3 years



Source: RBI, Union budget statements

But I&D and WS&S face challenges in PPP

Private Capital Committed

- 2017-2024: Rs 1.4 lac Cr (Rs 0.2 lac Cr/ yr)
- Transport (57.5%); Energy (42.3%): WS&S (0.1%); I&D (nil)

Source: World Bank PPI database

Private Capital Expected

- 2026/27 – 2028/29: Rs 2.9 Lac Cr (Rs 1 lac Cr/ yr)
- Transport (25.2%); Energy (36.2%); WS&S (2.0%); I&D (nil)

Source: National Monetization Pipeline, DEA State Pipeline

B. Irrigation & Drainage PPP – Progress, Challenges, Opportunities
1. Progress

Modality	Private-sector role	Private capex	Payment (O&M Phase)	Typical period	Irrig & D		WS&S
					Canal	PPIN	
1. O&M Contract	Operate existing assets; routine maintenance; meet KPIs	None	User tariffs; Perf-based (PB) payments	3–10 yrs	W. Bengal		
1a. Design, Build, Operate (DBO)	Design & build assets, then O&M, meet KPIs	None	Same as above	5–15 yrs		MP	Many MDB projects
2. DB, Finance, Operate (DBFO)/ HAM	Design, build, partly finance, O&M, meet KPIs	Partial (e.g., 30–60%)	User Tariffs PB Annuity	15–30 yrs			Nagpur NGanga
3. DBFOT/ BOT	Design, build, finance all capex, O&M, Transfer	Full	User tariffs	20–30+ yrs			

PPIN = pressured pipe irrigation network

2. Challenges

Critical element	Explanation	Irrigation-related challenge
1 Bankability	Predictable cash flow from user tariff must cover debt service, plus a reasonable return.	• Cash flow from user tariffs is too low (both level and compliance) to recover O&M cost, and capital cost • Canals: Complexity in service delivery
2 Balanced risk allocation	Risks assigned to the party should be manageable. Transferring uncontrol-able risks should be avoided	• A state-backed O&M subsidy and annuity payment is normally required
3 Sound public institutions	(a) Contracting parties: Skilled public authority; accountability in contract administration, dispute resolution (b) Fiscal credibility and affordability: Credibility in committed payments (c) Regulators/ regulations: Fair, rational tariff setting; independent oversight based on stable rules	• Absence of regulator: Tariff not so conducive (e.g. fixed tariff for affordable large users)

3. Opportunities for Private Sector Engagement & Advancement

Service Delivery must do: (a) Sufficient (non-excessive) water delivery to farmers
(b) System sustained with highest user fee compliance

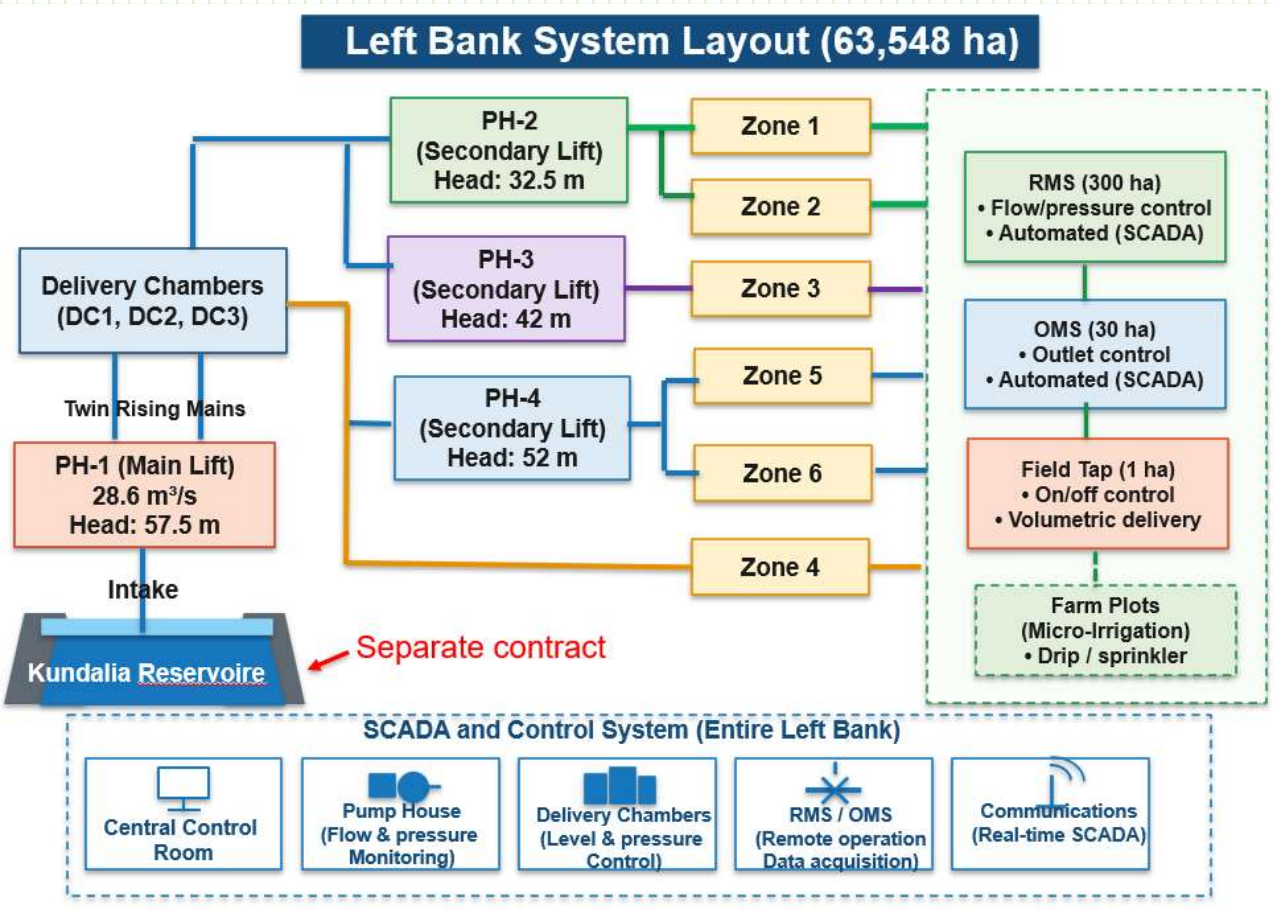
Elements	Canal System	PPIN
Water Distribution		
• Accurate delivery and measurement of water to individual farmers	Not possible	Possible (up to 1ha tap)
• Delivery to individual users	Delegated to WUAs, Challenging	Managed with accuracy
Water Users		
• Unit of operator interface	Minor canal, or outlet (-100ha)	Outlet (30ha), and tap (1 ha)
O&M Costs, Billing, and Charging		
• Cost	Lower	Higher (with higher benefits)
• Billing	Area & crop based	Quantity based billing possible
• Enforcement	Limited	Manageable (possible to restrict supply to non-payers)

PPIN provides tools to operators to achieve the above objectives systematically

C. DBO: Exemplary Case

1. Salient Features

- Kundalia Irrigation project (under ADB-funded MP Irrigation Efficiency Improvement Project)
- CCA: 125,000 ha (from 37,300 ha before project)
- Executing Agency: MP Water Resources Dept
- Project Cost: $535.7m (ADB financing of $375.0m)
- Implementation: 2018–
- Contract Modality: DBO with 5-year O&M



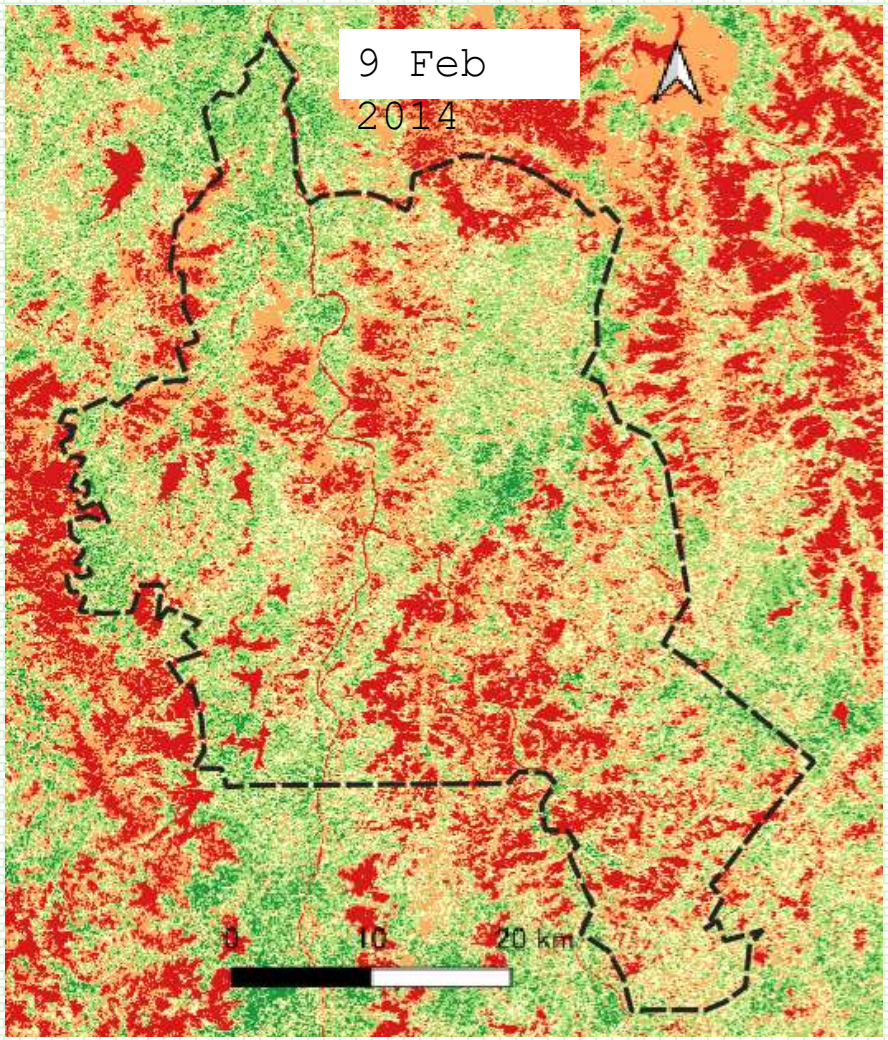
2. DBO Contract Structure

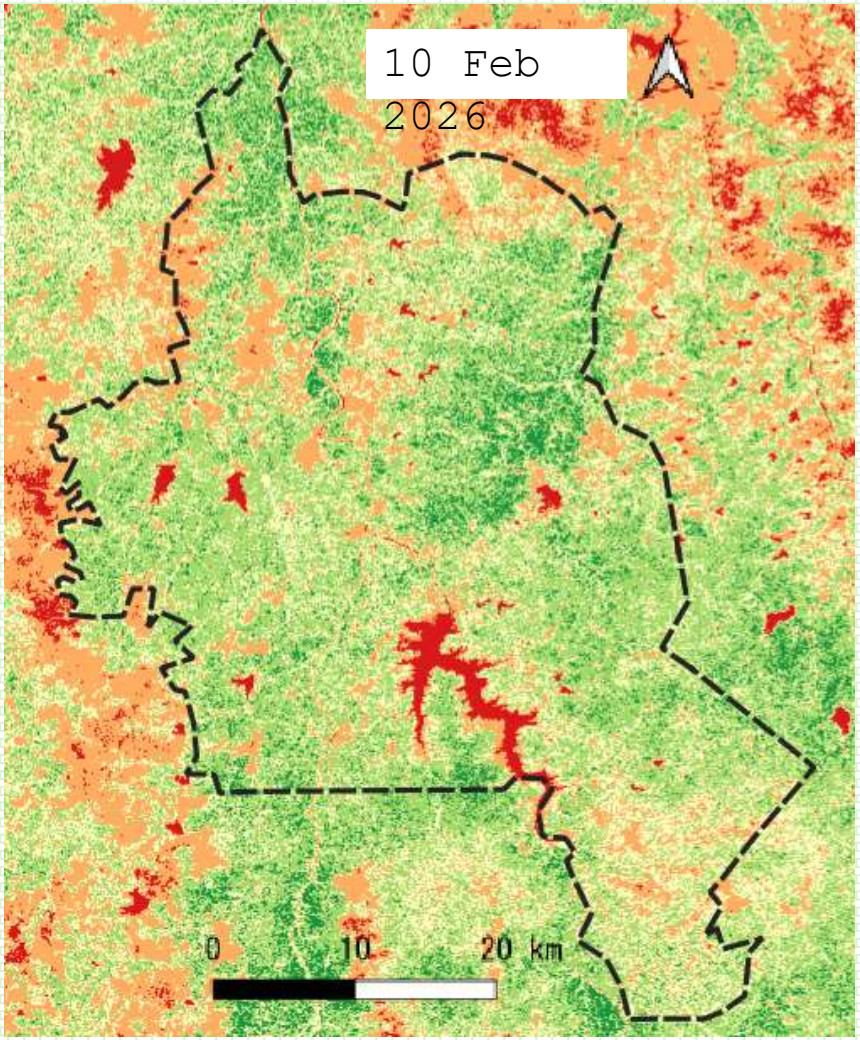
Role of WRD	Role of Contractor
Design & Build Phase (3 years)	
• Role of DBO Employer • *Monitor & guide WUA and agri programs* • Payments to contractor	• Design, construct, test, & commission PPIN • *Set up WUAs & water distribution practices* • *Set up farmer training centers*
O&M Phase (5 years)	
• Allocate water & approve irrigation plan • *Set tariff levels, issue bills and collect fees* • Payments based on set performance targets	• O&M of PPIN and distribute water • *Measure & report water delivery up to tap* • Continue WUA and agriculture extension

Notes:

- 2 packages for Rs 2,600 Crore, signed in 2018
- DB phase is completed (affected by COVID-19)
- Full water supply started in 2024/05 Rabi season, achieving performance targets and full irrigation of command area

Significant Impacts





CAA boundary

NDVI
- <= 0.10
- 0.10 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- > 0.40

NDVI = normalized difference

D. Possibilities for PPIN DBFO (X% Cost Borne by Private)

1. Opportunities

- Large-scale PPIN – MP, Maharashtra, Rajasthan, ….
- Rollout of M-CAD

2. DBFO – Key Elements of Pros & Cons

- Lifecycle design incentives – higher durability, innovations
- Stronger completion discipline
- Higher leverage to ensure quality O&M with longer period (10-15 years)
- Reduced cost to state during construction period
  - ➡ Source of implementing more pipeline projects = faster PPIS expansion
- Higher financing cost to the state (compared with state borrowing of X% cost)
  - ➡ Balanced out by large project impacts (production, induced revenue, etc.)
    Life-cycle cost analyses required
- High O&M subsidy – permanent liability, fiscal stress
  - ➡ Scope for rationalizing (volume-based tariff; integrating operation, billing & charging)

➡ **Overall, possibility for higher value for money**

D. Conclusion and Recommendations

- Limited application of PPP in I&D sector, due to low bankability and complexity in service delivery of canal systems
- PPIN is equipped with tools to manage service delivery systematically (accurate delivery, measurement, and billing to individual users)
- PPIN DBO in MP demonstrating intended results (quality outputs & service delivery/ O&M)
- Extending DBO to DBFO can augment impacts with reduced initial cost to the state, and may result in higher value for money, subject to life-cycle cost analyses, and efforts to rationalize O&M subsidy
- Prospected acceleration of large-scale PPIN and M-CAD may provide an opportunity to consider this direction
- For canal systems, further piloting of O&M contracts and building experience and evidence may be considered

Thank You

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