Indian Irrigation in Transition: Growing Disconnect between Public Policy and Private Enterprise

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Indian irrigation is like a palimpsest with old scripts making room for new ones: individual Farmer is displacing the State and the community as architect, Builder and manager of irrigation.

Despite massive investments, public & community irrigation commands are Shrinking because of widening rift between surface irrigation technology and India’s changing socio-technical fundamentals.

It will not help if irrigation institutions reform. Public Irrigation systems need to morph to make water-scavenging irrigation sustainable. They can do this by turning demand-driven.

Ostrich-like, Indian irrigation policy keeps building more canal Irrigation and promote fairy-tale institutional reforms. But it has little to do with India’s real/irrigation economy.

An irrigation policy that can shape India’s real/irrigation economy will need to understand its underbelly and pursue an IWRM but of a Uniquely Indian variety.
Evolution of Indian Irrigation:
Era of adaptive irrigation—upto 1830

- **Community was the unit of irrigation management**

% Contribution to aggregate Farm output and incomes

- Rainfall, Soil moisture and RWHs
- Flow irrigation from large canals, rivers
- Lift irrigation from wells and surface sources

Rainfall, soil-moisture, floods, RWHs (tanks, ahar-pynes, kuhls)

% of water consumptively used in agriculture
Evolution of Indian Irrigation:
Era of canal construction-1830-1970

• **State emerged as the architect, builder, manager of irrigation**

% Contribution to aggregate
Farm output and incomes

- Soil moisture management and RWHs
- Flow irrigation from canals, rivers
- Lift irrigation from wells & surface sources

% water consumptively used in agriculture

- Canal and tank irrigation
Evolution of Indian Irrigation:
Era of atomistic pump irrigation-1970-todate

**Individual farmer as the irrigation manager**

% Contribution
To Farm output & incomes

- Soil moisture management
- Flow irrigation
- Pump irrigation from wells, tube wells, canals

Scavenged
Ground and
Surface water

% of water consumptively used in agriculture
### Command areas in South Asia are shrinking..

<table>
<thead>
<tr>
<th>State</th>
<th>1993-4</th>
<th>2000-1</th>
<th>% change</th>
<th>1993-4</th>
<th>2000-1</th>
<th>% change</th>
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<tbody>
<tr>
<td>Andhra Pradesh</td>
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<td>0.77</td>
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<td>Assam</td>
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<td>MP &amp; Chattisgarh</td>
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<td>-10</td>
<td>147</td>
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<td>Punjab</td>
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<td>1168.7</td>
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<td>2622</td>
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<tr>
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<td>West Bengal</td>
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<td>622</td>
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<td>1020</td>
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<td>-14.5</td>
</tr>
<tr>
<td>Pakistan Punjab</td>
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<tr>
<td>Sind</td>
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<td>1960</td>
<td>-14.8</td>
<td>140</td>
<td>200</td>
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<tr>
<td>Bangladesh</td>
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<td>2124</td>
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<td>+63</td>
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<td>All areas</td>
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<td>17215</td>
<td>-24.2</td>
<td>28437</td>
<td>35762</td>
<td>+25.8</td>
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</tbody>
</table>
Classes of Irrigators in South Asia

- Gross revenue & Irrigation cost/ha
- 20-22 mha canals & tanks
- 30-32 mha Own electric pumps
- 10-12 mha Electric pump purchase
- 12-15 mha Own diesel pump
- 7-8 mha Rented diesel pump
- Own and rented gensets

Most diesel pump irrigation is in the IGB

15-18 million Marginal farmers and share cropper families

These buy irrigation for food security and to absorb family labour

The bulk of ag. water use esp. by poor is very costly

The bulk of ag. water use esp. by poor is very costly

Million ha of gross irrigated area
India is the world’s largest user of groundwater in agriculture in the world. India has over 20 million irrigation wells. We add 0.8 million/year. Every fourth cultivator owns an irrigation well; non-owners depend on groundwater markets. Increasing irrigation in canal and tank commands is with Pumped water
This groundwater boom is a reflection not of water scarcity as in California or Spain but of land-scarcity.
Drivers of Atomistic Irrigation: Ghettoization of India’s Agriculture

The compelling advantage of pump irrigation is that instead of adapting agriculture to Irrigation system, it adapts irrigation to farming system.
Drivers: Intensive Diversification

Our irrigation planning is preoccupied with food grains; Indian farmer is diversifying in a hurry.

Canal and tank irrigated areas condemned to low-value crops unresponsive to precision irrigation.

Much diversification is Occurring outside Command areas (IFPRI).

Much diversification Requires small dozes of Year-round, on-demand Irrigation.

Value added small-scale farming booms with pump Irrigation.
<table>
<thead>
<tr>
<th>1960’s</th>
<th>2000+</th>
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</thead>
<tbody>
<tr>
<td>Investing in public and community irrigation</td>
<td>Groundwater regulation</td>
</tr>
<tr>
<td>Command Area Development</td>
<td>Arresting and reversing groundwater depletion;</td>
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<tr>
<td>Control of water logging and salinization</td>
<td>Groundwater quality</td>
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<tr>
<td>Financial sustainability of irrigation systems</td>
<td>Fluoride and arsenic contamination</td>
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<tr>
<td>Modernization of large and small surface systems</td>
<td>Electricity subsidies</td>
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<tr>
<td>Efficiency and equity in water distribution</td>
<td>Energy efficiency of irrigation</td>
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<tr>
<td>Reorienting irrigation bureaucracy</td>
<td>Water productivity</td>
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<tr>
<td>Farmer management</td>
<td>Hydro-climatic change</td>
</tr>
<tr>
<td>PIM/IMT</td>
<td>Groundwater recharge</td>
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<tr>
<td></td>
<td>Integrating surface and groundwater storages</td>
</tr>
</tbody>
</table>
India’s New Irrigation Playing Field: *Integrated WRM of a different sort.*

- Energy-Groundwater Nexus
- Participatory Groundwater Recharge
- Irrigation Governance
- Conj. Mgt. of Rain, surface and ground water
- Micro-irrigation
- Adaptation to Groundwater Quality decline

<table>
<thead>
<tr>
<th>Spheres</th>
<th>Key Players</th>
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</thead>
<tbody>
<tr>
<td>Irrigation</td>
<td>Electricity Utilities; Rural Electrification Corporation</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Electricity Utilities; Rural Electrification Corporation</td>
</tr>
<tr>
<td>Recharge</td>
<td>Electricity Utilities; Rural Electrification Corporation</td>
</tr>
</tbody>
</table>

Irrigation Deptts; Watershed Managers; Rainfed Authority

Irrigation Equipment Co’s; MI Subsidy; MI SPVs (e.g. GGRC)

Water Supply agencies; Public Health Agencies; NGO’s; technology providers

They do not even know They are Key players

Are key strategic players engaged in policy process?
“The development of irrigation has outrun its administration ...”

Col. W. Greathed, Chief Engineer, Upper Ganga Canal, 1869

Conclusion?

Thank you for your attention..
Taming the Anarchy

GROUNDWATER GOVERNANCE IN SOUTH ASIA

Tushaar Shah