India - Effectiveness of Rural Water Schemes

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RWS Expenditures Continuously Increasing

% Rural habitations covered with safe drinking water

- Fully
- Partially
- Not covered

Habitations ('000)

<table>
<thead>
<tr>
<th>Year</th>
<th>Habitations ('000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-99</td>
<td>1000</td>
</tr>
<tr>
<td>99-00</td>
<td>1100</td>
</tr>
<tr>
<td>00-01</td>
<td>1200</td>
</tr>
<tr>
<td>01-02</td>
<td>1300</td>
</tr>
<tr>
<td>02-03</td>
<td>1400</td>
</tr>
<tr>
<td>03-04</td>
<td>1500</td>
</tr>
<tr>
<td>04-05</td>
<td>1600</td>
</tr>
</tbody>
</table>

Expenditure (Rs bln)

<table>
<thead>
<tr>
<th>Year</th>
<th>Expenditure (Rs bln)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-99</td>
<td>100</td>
</tr>
<tr>
<td>99-00</td>
<td>110</td>
</tr>
<tr>
<td>00-01</td>
<td>120</td>
</tr>
<tr>
<td>01-02</td>
<td>130</td>
</tr>
<tr>
<td>02-03</td>
<td>140</td>
</tr>
<tr>
<td>03-04</td>
<td>150</td>
</tr>
<tr>
<td>04-05</td>
<td>160</td>
</tr>
</tbody>
</table>

Cum Exp (since 1992)
Coverage Slipping
(10th plan working group estimates)

Total Rural Habitations = 1.4 million

- Partially/Not Covered 20%
- Sources going dry or becoming quality affected
- Systems working below capacity due to poor O&M
- Increase in population resulting in lower per capita availability

Is RWS expenditure improving service delivery?
How cost effective is the RWS program?
Objective of the Study

This study is an attempt to understand the effectiveness of rural water supply schemes, based on a large representative ‘scheme’ and ‘household’ sample across ten states in India.

- The purpose of the study is to contribute to the policy discussions for improving rural water supply service delivery, based on a ‘reality check’ of the performance of existing schemes.

- This study looks at various aspects of rural water supply, including:
  - flow of funds and expenditures,
  - performance of schemes,
  - cost of supply,
  - household coping strategies and costs,
  - household willingness to pay and affordability.
Study Design

Consumer Survey
- Sample Consumer Survey
  - Current service vs demand
  - Coping strategies
  - Coping Cost
  - Preferences for Improvements
  - WTP and Affordability

Scheme Survey
- Secondary Data State
- Secondary Data District/Village
- Sample Scheme Survey
  - Capital & O&M costs
  - Cost recovery
  - Design & Actual performance
- Panchayat Level
  - Fund flow by source
  - Fund utilisation

Representative Schemes

State Representative Schemes
Expenditure on Supply Driven Schemes Dominate

Flow of Funds for RWS under different programs (1997-98 to 2005-06)

- ARWSP: 34%
- MNP: 42%
- EAP: 6%
- Swijldhar + sector reform: 6%
- Others: 5%
- PMGY: 7%

Expenditure on Demand vs Supply driven schemes (1997-98 to 2005-06)

- 91%
- 9%

At 2005-06 prices
Problems reported by households (% of HH reporting)

- Supply Inadequate
- Frequent Breakdowns
- Shortage in certain months of the year
- Timing not suitable
- Low Pressure
Dependence of Rural Households on Public and Private Water Sources

Managed by

Schemewise

Dependence on Multiple Sources

(% HHs)

Main + Supplementary Public + Private
Main Public + Private
Main + Supplementary Public
Main Public only
High Coping Costs

Estimated coping cost borne by households (Rs per month)

Managed by Schemewise

Coping cost + water charges as % of income

Monthly income (Rs)
Actual Cost of Schemes much higher than Norms

### Actual cost of piped water schemes vs cost norm

<table>
<thead>
<tr>
<th>% of schemes in which per cap capital cost &gt; norm</th>
<th>% of schemes in which pre cap O&amp;M cost &gt; norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>7%</td>
<td></td>
</tr>
</tbody>
</table>

- **By 100% or more**: 25%
- **By 50-100%**: 11%
- **By 25-50%**: 7%
- **By 0-25%**: 7%

### Cost of piped water supply infrastructure

- **Cap bldg/SO/NGO**:
- **Instnl Cost**:
- **Capital Cost**

#### By 100% or more

- **PU/govt**: 25%
- **Community**: 14%

#### By 50-100%

- **PU/govt**: 11%
- **Community**: 7%

#### By 25-50%

- **PU/govt**: 7%
- **Community**: 3%

#### By 0-25%

- **PU/govt**: 7%
- **Community**: 4%
Costs vary across States

Cost Distribution for RWS (1997-98 to 2005-06)

- Rs/HH
- Capacity building/SO/NGO cost
- Institutional cost
- Capital cost

Pu/Govt
Community
Kerala
Kar
Kerala
Karnataka
Maharashtra
Mah
UP
Uttar Pradesh
UTTK
Mah
TN
Tamil Nadu
AP
Andhra Pradesh
Punjab
Orissa
WB
West Bengal

64%
14%
1%
Instnl
23%
Cost Recovery relatively better in Demand Driven Schemes

HP
Avg
Community managed
GP managed
PU managed

0 %
46 %
71 %
52 %
21 %

Piped Water Supply Schemes
O&M Cost Recovery much lower against Design Costs

- Mini water: Good Practice Design Cost 65%, Actual Cost Incurred 58%, Cost Recovery 37%
- SVS: Good Practice Design Cost 55%, Actual Cost Incurred 53%, Cost Recovery 29%
- MVS/Reg: Good Practice Design Cost 56%, Actual Cost Incurred 35%, Cost Recovery 19%
- All: Good Practice Design Cost 57%, Actual Cost Incurred 46%, Cost Recovery 27%
Effectiveness of Service Delivery vis-à-vis all Indicators

- Reliability & Adequacy
- Affordability
- Environ Sustainability
- Fin Sustainability

PU
GP
Community
Subsidy per year, 1997-2005

<table>
<thead>
<tr>
<th>State</th>
<th>O&amp;M Cost (Rs million)</th>
<th>Capital Cost (Rs million)</th>
<th>Indirect Power (Rs million)</th>
<th>Subsidy per HH served (Rs/month)</th>
<th>Ratio to state domestic product (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Bengal</td>
<td>33</td>
<td>71</td>
<td>88</td>
<td>17</td>
<td>0.2</td>
</tr>
<tr>
<td>Orissa</td>
<td>10</td>
<td>21</td>
<td>43</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Punjab</td>
<td>63</td>
<td>43</td>
<td>0.4</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>17</td>
<td>65</td>
<td>88</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>33</td>
<td>71</td>
<td>65</td>
<td>0.3</td>
<td></td>
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<tr>
<td>Tamil Nadu</td>
<td>21</td>
<td>10</td>
<td>63</td>
<td>0.2</td>
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<tr>
<td>Maharashtra</td>
<td>65</td>
<td>37</td>
<td>0.2</td>
<td>0.4</td>
<td></td>
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<tr>
<td>Kerala</td>
<td>33</td>
<td>21</td>
<td>0.3</td>
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<td></td>
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NOTE: O&M cost subsidy is computed on the basis of O&M cost of schemes and O&M cost recovery.

Rural Subsidies on roads, Power ≈ 0.1%; 2% of GDP.
Cost inefficiencies higher in Supply driven Schemes (Piped Water)

- Comparison between Supply driven and Demand driven schemes.
- Graph showing various costs:
  - Capital cost
  - Supplementary source cost
  - Institutional cost
  - Indirect power subsidy
  - O&M cost
  - Coping cost
  - SO/NGO cost

- Economic cost vs Economic cost + time cost (standposts)

Rs / KL
1% GDP Loss Due to Inefficiency

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
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<tr>
<td>Loss due to inefficiency of piped water supply systems in the ten states studied</td>
<td>Rs 50.2 billion per year</td>
</tr>
<tr>
<td>Loss due to schemes getting defunct</td>
<td>Rs 1.9 billion per year</td>
</tr>
<tr>
<td>Possible resource saving during 1997-98 to 2005-06</td>
<td>Rs 468 billion</td>
</tr>
<tr>
<td>% loss in GDP in the ten states</td>
<td>0.9%</td>
</tr>
</tbody>
</table>
Economies of Scale yet to be realised

Scheme size and cost of water supply (annualized capital cost plus O&M Cost)

- Cost per HH, ground water based
- Cost per HH, surface water based

Optimum scale
WTP & Affordability much higher than User Charges

Stand Post Users

<table>
<thead>
<tr>
<th>Costs</th>
<th>WTP for improved services</th>
<th>Affordability for improved services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs/month</td>
<td>Water Charges</td>
<td>Exp on own sources</td>
</tr>
<tr>
<td>90</td>
<td>80</td>
<td>70</td>
</tr>
</tbody>
</table>

Pvt Connection Users

<table>
<thead>
<tr>
<th>Costs</th>
<th>WTP for improved services</th>
<th>Affordability for improved services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs/month</td>
<td>Water Charges</td>
<td>Exp on own sources</td>
</tr>
<tr>
<td>120</td>
<td>110</td>
<td>100</td>
</tr>
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Observations & Way Forward
Key Challenges

• **Performance of Schemes**
  – Inadequacies in Service Provision
  – Dependence on Multiple Sources
  – High Coping Costs borne by Households

• **Cost of Service Provision**
  – High Institutional Costs
  – High Capital Cost and Inadequate O&M Costs
  – Over-provisioning by some Schemes
  – Defunct or Partly Functioning Schemes
  – Existence of Multiple Schemes
  – Low Cost Recovery from Beneficiaries
  – Huge Direct and Indirect Subsidies
  – High Cost of Service Provision compared to Economic Cost
  – Funding Programs continue to Support Supply Driven Programs

• **Effectiveness of Service Delivery**
  – Indices confirm ‘low to moderate’ Effectiveness
  – Fraction of Expenditure trickles down to Beneficiaries
  – Economies of Scale not Realized
  – Strong Demand, Willingness to Pay and Affordability
Way Forward

Emergence of a New Model?

Redefine Swajaldhara

Adopt Flexible Norms for Service Delivery

Implement Top-down/Bottom-up Planning

Reduce Inefficient Costs

Un-bundle to Improve Accountability

Adopt Scale Efficient Scheme Size

Improve O&M Cost Recovery

Improve Scheme Design, Monitoring

Improve Accountability