Sustaining Groundwater Resources For Stabilising Agrarian Livelihood: A Case Study Of South-western Haryana

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What are the factors leading to the depletion of Groundwater in the area?

What are the socio-economic implication of depleting Groundwater resources?

Depleting groundwater resources and its drastic implication over the life, livelihood and ecology in todays time as well as over the next decade.
A lot of our money is going into these wells, but we are also alive only because of them.

- A farmer in the study area
Bio-physical Characteristics And Human Geography

- Scanty and erratic rainfall
- Undulating topography
- Semi-arid region
- Scattered and individualistic habitation
- Reoccurring generational internal migration
Water Resources and Utility - The Temporal Story

- Unproductive rainfall
- Deteriorating traditional water sources
- Depleting groundwater resources
- Challenging canal water supply

- Increased agrarian and domestic water needs
- Single source effective dependency
- Behavioural issues of uses practices
- Absenteeism of user’s managerial interaction and regulatory setup
More water intensive crops are being cultivated as compared to earlier cropping pattern; Over the years, rain fed agriculture is turned into the irrigated one.
The cropping pattern transition was led by the state policies under the push of Green revolution. The urge of food security was achieved at the loss of nutrition loss.
The state agriculture and electricity policy had made the extraction of groundwater mechanically and financially viable for the farmers. Though this had resulted in increasing the farm productivity and higher income but the financial richness was achieved at the cost of drowning of natural resources particularly the ground water.
In most of the cases, the respondents (farmers) had choose to manage the supply side instead of demand side. This approach was cost intensive but was necessary to maintain the production status-quo.
**Socio – Economic Implications**

- Economic Implications Of GW Depletion
  - Lowering of Pump – 52 feet; 2.3 times in last 10 years
  - Increasing Pump capacity - 10.7 hp to 15.1 hp on an average in last 10 years
  - Deepening of tube well
  - Annual cost of O&M for irrigation – 8220 INR
  - Pump Failure – Time And Social Cost

**GW Depletion, Coping Mechanism And Livelihood Status**

- Capital Incentive
  - Sourced mainly from Agriculture income and non-agricultural sources (livestock and tertiary sector)
  - If Agriculture become a non-profit venture due to increased COC and O&M of irrigation
    - Other source of capital investment in GW are Livestock and non-agricultural sources.
      - First exclusion - SC and marginalised
  - Issue of Life and livelihood
    - Food – Agriculture
    - Drinking water – Common source
    - Livestock – Water Market
    - Dual Migration
Possible Interventions

Groundwater recharge by canal water through ‘johad’

Engineering Solutions

Setting up the user committees for O&M and federal governance

Regulation and Governance

Restricting the use of unproductive irrigation as well as promotion to less water intensive crops

Demand side enhancement
Engineering Interventions

- Canal Water
- Johad
- Recharge shaft
- Aquifer - Groundwater
- Tube Well
- Irrigation
- Domestic Supply
Demand Side Interventions

- Sensitization Towards Water Resources
- Recharge From Domestic Waste Water
- Reducing Unproductive Irrigation
- Promotion To Less Water Intensive Crops
Regulation and Governance Interventions

Establishing User’s Committees For O&M

Co-Management

Capacity Building Of User’s On Groups

Federal Governance Structure
<table>
<thead>
<tr>
<th>Community</th>
<th>Efficiency</th>
<th>Equity</th>
<th>Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water related – pumping systems, irrigation efficiency etc.; Economic –</td>
<td>Access to domestic water;</td>
<td>Sensitization to concept of aquifers and CPRs – restoring shallow aquifer</td>
</tr>
<tr>
<td></td>
<td>improvement to CBR</td>
<td>access to irrigation –</td>
<td>systematic access rather than systematic access rather than</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>random; distribution?</td>
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<tr>
<td>Program</td>
<td>Modernised Agriculture</td>
<td>Participation, co-operation</td>
<td>Conjunctive use – rationalisation of</td>
</tr>
<tr>
<td></td>
<td>Water Balance</td>
<td>and decision making at</td>
<td>demand and supply</td>
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<td></td>
<td></td>
<td></td>
<td>Panchayat level</td>
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<tr>
<td>Policy</td>
<td>Procurement and MSP; information and knowledge</td>
<td>Regulation through protocols</td>
<td>Seriously address efficiency and equity issues to ensure sustainability (perhaps,</td>
</tr>
<tr>
<td></td>
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<td>aquifer based management for incentives and disincentives)</td>
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</tbody>
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Thank You!!!

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