Surface Irrigation and Livelihoods: Results of User-Managed Irrigation Systems in Maharashtra, India

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Introduction

- India’s total irrigation potential: **139.9 million hectare**
  # Created: **102.77 million hectare**
  # Utilized: **87.23 million hectare (2006-07)**

- To bridge the gap, various policy reforms were undertaken by the Central & state governments.

- Started with the implementation of Command Area Development (CAD) program (1974-75).

- Finally various acts, guidelines, and policies were drafted by states for farmer’s participation in irrigation management.

### Introduction - Maharashtra Profile

<table>
<thead>
<tr>
<th>Geographical Area</th>
<th>30.8 M.ha.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>100 M (2001 Census)</td>
</tr>
<tr>
<td>Cultivable Area</td>
<td>22.54 M.ha.</td>
</tr>
<tr>
<td>Annual Rainfall</td>
<td>500- 6000 mm (avg.1300 mm)</td>
</tr>
<tr>
<td>River Basins</td>
<td>Krishna, Godavari, Tapi, Narmada and west flowing rivers of Konkan</td>
</tr>
<tr>
<td>Total Irrigation Potential (Surface and Groundwater)</td>
<td>12.6 M.Ha.</td>
</tr>
<tr>
<td>Irrigation Potential Created</td>
<td>6.3 M.Ha.</td>
</tr>
<tr>
<td>Irrigation Potential Utilized</td>
<td>4.8 M.Ha. (2003-04)</td>
</tr>
</tbody>
</table>
Introduction - PIM in Maharashtra

- Traditional System of Cooperation for management of Irrigation water - *Phad System*

- Co-operative lift irrigation schemes at Panchaganga and Bhogavati rivers.


- Maharashtra Management of Irrigation System by Farmers Act, 2005 (MMISF)
# Introduction - PIM in Maharashtra

<table>
<thead>
<tr>
<th>WUA Category</th>
<th>Number</th>
<th>CCA (in 000' Ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WUA which have Started Functioning</td>
<td>2577</td>
<td>1010.7</td>
</tr>
<tr>
<td>WUA whose Agreement is done</td>
<td>271</td>
<td>93.2</td>
</tr>
<tr>
<td>Registered WUA, Agreement is yet to be done</td>
<td>1049</td>
<td>393.9</td>
</tr>
<tr>
<td>WUA under Proposal</td>
<td>3189</td>
<td>1065.5</td>
</tr>
</tbody>
</table>

Source: DIRD, PUNE
Objective of the Study

To understand how the formation of village institution (WUAs) has an impact on the stakeholders livelihoods.
Methodology - Study Area

Nashik
Akola
A’Ngr
Nanded

Methodology- Selection of WUAs and Respondents

- WUA’s selection- Preliminary field survey, Informal discussions, Schedule.

- Final selection based on performance criteria.

- Respondent selection- Random sampling (10%). Representing head, middle and tail.

- Primary information from respondents- Schedule, FGD and Informal discussions

- Secondary Information- Records, literature review.
## Methodology - Selected WUA’s

<table>
<thead>
<tr>
<th>Head</th>
<th>Tail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Project &amp; Civil Society Promoted</strong></td>
<td>Yogeshwar WUA, Brahmani, Mula Irrigation Project, Ahmednagar (MRBC-D3M2)</td>
</tr>
<tr>
<td><strong>Major Project &amp; ID Promoted</strong></td>
<td>Kisan WUA, Borgaon, Katepurna Irrigation Project, Akola (Borgaon M1-Borgaon Distributory, LBC)</td>
</tr>
<tr>
<td><strong>Medium Project &amp; Civil Society Promoted</strong></td>
<td>Jai Yogeshwar WUA, Ozar, Waghad Irrigation Project, Nashik (WRBC- M19 &amp; M18A)</td>
</tr>
</tbody>
</table>
## Profile of Selected WUA’s

<table>
<thead>
<tr>
<th>Name</th>
<th>Jai Yogeshwar WUA, Ozar</th>
<th>Kisan WUA, Borgaon</th>
<th>Krishan Kalva WUA, Malegaon</th>
<th>Yogeshwar WUA, Brahmni</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CCA</strong></td>
<td>595</td>
<td>121</td>
<td>1036.1</td>
<td>292</td>
</tr>
<tr>
<td><strong>ICA</strong></td>
<td>390</td>
<td>101</td>
<td>658.32</td>
<td>200</td>
</tr>
<tr>
<td><strong>Water Allotment-</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kharif</strong></td>
<td>273 TCM</td>
<td>-</td>
<td>999 TCM</td>
<td>185.75 TCM</td>
</tr>
<tr>
<td><strong>Rabi</strong></td>
<td>587 TCM</td>
<td>Not Found</td>
<td>3426 TCM</td>
<td>464.96 TCM</td>
</tr>
<tr>
<td><strong>Summer</strong></td>
<td>-</td>
<td>Not Found</td>
<td>1526 TCM</td>
<td>124.02 TCM</td>
</tr>
<tr>
<td><strong>Total Beneficiaries</strong></td>
<td>339</td>
<td>64</td>
<td>581</td>
<td>273</td>
</tr>
<tr>
<td><strong>Total Members</strong></td>
<td>292</td>
<td>64</td>
<td>295</td>
<td>172</td>
</tr>
<tr>
<td><strong>Composition</strong></td>
<td>87% general</td>
<td>45% general</td>
<td>91% general</td>
<td>85% general</td>
</tr>
<tr>
<td><strong>Irrigation mode</strong></td>
<td>Conjunctive</td>
<td>Canal</td>
<td>Conjunctive</td>
<td>Conjunctive</td>
</tr>
</tbody>
</table>
Performance of WUAs - Irrigated Area

Change in Irrigation Intensity (II=Irrigated Area/CCA)

- Ozar: 17.6%
- Borgaon: 43.8%
- Malegaon: -28.92%
- Brahmni: 27.4%

Dam Storage Levels

<table>
<thead>
<tr>
<th>Dam Storage Levels</th>
<th>Pre WUA (in million m³)</th>
<th>Post WUA (in million m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waghad (Ozar)</td>
<td>58.63</td>
<td>76.44</td>
</tr>
<tr>
<td>Katepurna (Borgaon)</td>
<td>86.35</td>
<td>68.05</td>
</tr>
<tr>
<td>Purna (Malegaon)</td>
<td>677.43</td>
<td>1052.07</td>
</tr>
<tr>
<td>Mula (Brahmni)</td>
<td>736.12</td>
<td>736.12</td>
</tr>
</tbody>
</table>
Performance of WUAs - Recovery

Recovery%  
- Ozar: 93
- Borgaon: 71
- Malegaon: 74
- Brahmni: 34

Irrigation Revenue Recovery
Performance of WUAs - Financial Position

- Increasing cost of minor repair: Transferred without R&R.
- Same irrigation charges from past 3-4 years
Impact on Livelihoods - Crop Productivity

Changes in Average Crop Productivity

Soyabean (Ozar, Malegaon, and Brahmini) and Citrus (Malegaon) was introduced after the formation of WUA.
Impact on Livelihoods - Livestock

- Milch animals: a) shift in cropping pattern, b) labor requirement, c) less profit.

- Non-Milch population: a) use of modern technology, b) cost factor

Change in Livestock of the Respondent

<table>
<thead>
<tr>
<th>WUA's</th>
<th>Milch</th>
<th>Non-Milch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozar</td>
<td>-7</td>
<td>-31</td>
</tr>
<tr>
<td>Borgaon</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Malegaon</td>
<td>-22</td>
<td>-38</td>
</tr>
<tr>
<td>Brahmi</td>
<td>5</td>
<td>-24</td>
</tr>
</tbody>
</table>

% increase/decrease
Impact on Livelihoods - Assets

Change in Assets of the Respondents

% increase/decrease

WUAs

- Wells
- Bore wells
- Tractors
- Electric pump
- Diesel pump

Ozar
Borgaon
Malegaon
Brahmini
Livelihood Impacts

- Assured irrigation and increase in net irrigated area
- Shift in cropping pattern
- Increase in crop productivity and associated profit
- Impact on livestock and assets
- Assured work for local & migrant labors for a period of time
- Less conflicts and improved relationship among farmers
- Improvement in conveyance system and better management of resource.
Catalyst for such Impacts

VULNERABILITY

Inefficient Conveyance System
Resource Scarcity (Water)

Trust & Belief

Influence on Assets

Understanding of the problem

Availability of Water/Management

Conveyance System

System Management & Crop Diversification

Increase in Income
Improvement in living standard and Well being
Better management of system and resource

Source: DFID Sustainable Livelihoods Framework Model

Improving water and land resources management for food, livelihoods and nature
What Next?

- To achieve more irrigation in available water.
- Better equity across command.
- For this to happen, requirement of efficient physical system in place (physical asset).
- Then probably volumetric pricing makes much more sense.
Conclusion

• PIM certainly has an impact on the livelihoods of the village community.

• To further strengthen the outcomes, physical infrastructure of the conveyance distribution system need to be made much more efficient by carrying out proper R&R work.
  WUAs need to be given Capacity Building and Technical trainings.

• Civil society organizations perhaps can play a major role in facilitating this.
THANK YOU
Condition of Physical System

Minor 18A - Lined (Ozar)

Minor 18A - Unlined (Ozar)