Institutionalizing governance arrangements for sustainable management of community based Silvi-pasture systems in arid ecoregions in Rajasthan, India

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Western arid Rajasthan is highly vulnerable region facing frequent droughts, crop failures, low & unstable livelihoods.

CGIAR research program on Dryland Systems was initiated 2014 for improving farming systems resilience and associated livelihoods using an integrated holistic approach.
Context

• Livestock is one of the most stable source of rural livelihoods in western arid Rajasthan, India (Thar desert): 19 m ha

• Rural HH heavily dependent on common pastures for fodder (*Oran and Gochar*)
  (>1 m ha such common SPS)
• Farm systems are park land systems
• Common pasture severely degraded-
  mostly used as open access
  Biomass yield: 0.2-0.6 t/ha
  Tree/ha: 8-15 to 2-5
• Weakening of local institutions- traditional rules ignored
Context

- Sustainability of number of rehabilitation efforts remained uncertain - Lack of peoples participation & poor governance, compartmentalized approach

- Rural HHs not investing time for rehabilitation as expected individual benefits are low and cooperation of fellow farmers is uncertain

- Vicious cycle of poor governance leading to CPR degradation, low productivity and loss of interest of community

- Critical for sustainable management of CPRs to facilitate appropriate governance arrangements (social dynamics, people preferences, inclusiveness, market)
Objective/ research question

- Understand how common property institutional arrangements can result in efficient use, equitable allocation, and sustainable conservation of silvi-pasture resources
  
  Understand the interconnectedness of our environment and its people

- Facilitate the community to design and pilot governance arrangements for sustainable management of common silvi-pastures to provide evidence based policy options
Location of action sites

Across the rainfall gradient

Damodara/Jaisalmer 170 mm
Dhok/Barmer 210 mm
Govindpura/Jodhpur 280 mm
## Approach and method

- **Literature review, stakeholders consultations, focus group discussion (FGDs) in villages**  
  - Key drivers of change and stakeholders perspective

- **Empirical study covering 180 HHs survey from 3 districts**  
  - Current status & future prospects  
  - Biophysical, Governance/institutional  
  - Second tier variables of the Social ecological system (SES)

- **3 workshop involving 18 communities and other stakeholders**

- **Economic experiments (grass vs local tree fodder)**  
  - Understanding risk and value preferences of livestock keepers

- **Participatory process/tools**  
  - Facilitating community to co-design institutional arrangements for sustainable management common pasture systems

### Governance arrangements as part of holistic approach
Action situations embedded in broader social-ecological systems (IAD framework)

Source: Adapted from E. Ostrom (2007: 15182).
Some characteristics of CPRs & selected villages

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Govindpura</th>
<th>Dhok</th>
<th>Damodara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households</td>
<td>150</td>
<td>355</td>
<td>157</td>
</tr>
<tr>
<td>Total livestock number</td>
<td>3,153</td>
<td>19,633</td>
<td>20,663</td>
</tr>
<tr>
<td>Part of the pasture treated in recent past</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Livestock dependence on CPRs and fallow lands</td>
<td>High</td>
<td>Very high</td>
<td>Very high</td>
</tr>
<tr>
<td>Current status of common pasture- biomass</td>
<td>Highly degraded</td>
<td>Degraded</td>
<td>Severely degraded</td>
</tr>
</tbody>
</table>

% share of livestock species in the villages:

- Govindpura:
  - Camel: 26.0%
  - Buffalo: 64.9%
  - Sheep: 0.0%
  - Goat: 0.0%
  - Cow: 0.0%

- Dhok:
  - Camel: 12.4%
  - Buffalo: 83.9%
  - Sheep: 0.3%
  - Goat: 0.3%
  - Cow: 0.3%

- Damodara:
  - Camel: 27.5%
  - Buffalo: 58.4%
  - Sheep: 13.7%
  - Goat: 0.0%
  - Cow: 0.0%
Farmers perception on fodder availability in CPRs
(Score on 0-10 scale)
<table>
<thead>
<tr>
<th>Second tier variables in an SES</th>
<th>Govindpura (Jodhpur)</th>
<th>Dhok (Barmer)</th>
<th>Damodara (Jaisalmer)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resource systems (RS): Community pasture</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS2 Clarity of system boundaries</td>
<td>To some extent</td>
<td>Mostly present</td>
<td>Mostly absent</td>
</tr>
<tr>
<td>RS3 Size of resource system*</td>
<td>Small</td>
<td>Large</td>
<td>Small</td>
</tr>
<tr>
<td>RS5 Productivity of system*</td>
<td>Low and decreasing</td>
<td>Moderate, but decreasing</td>
<td>Very low and decreasing</td>
</tr>
<tr>
<td>RS5a Indicators</td>
<td>Least available</td>
<td>Moderately available</td>
<td>Least available</td>
</tr>
<tr>
<td>RS7 Predictability of system dynamics*</td>
<td>Less predictable</td>
<td>Moderately predictable</td>
<td>Least predictable</td>
</tr>
<tr>
<td><strong>Governance systems (GS)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GS4 Property-rights systems</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>GS5 Operational rules</td>
<td>Mostly absent</td>
<td>Mostly present</td>
<td>Mostly absent</td>
</tr>
<tr>
<td>GS6 Collective-choice rules*</td>
<td>Limited autonomy at hamlet level</td>
<td>Full autonomy</td>
<td>Limited autonomy at hamlet level</td>
</tr>
<tr>
<td>GS7 Constitutional rules</td>
<td>Mostly absent</td>
<td>Mostly present</td>
<td>Mostly absent</td>
</tr>
<tr>
<td>GS8 Monitoring and sanctioning processes</td>
<td></td>
<td></td>
<td></td>
</tr>
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### Second tier variables in SES related to community pastures in Rajasthan

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<tbody>
<tr>
<td><strong>Resource units (RU): livestock</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RU1 Resource unit mobility*</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>RU2 Growth or replacement rate</td>
<td>Growing</td>
<td>Growing rapidly</td>
<td>Slow growth</td>
</tr>
<tr>
<td>RU4 Economic value</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td><strong>Users (U)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U1 Number of users*</td>
<td>Rapid growth</td>
<td>Rapid growth</td>
<td>Slow growth</td>
</tr>
<tr>
<td>U2 Socioeconomic attributes of users</td>
<td>Less disparity in socioeconomic status</td>
<td>Higher disparity in SE status</td>
<td>Less disparity in SE status</td>
</tr>
<tr>
<td>U5 Leadership/entrepreneurship*</td>
<td>Weak and inconsistent</td>
<td>Strong</td>
<td>Weak</td>
</tr>
<tr>
<td>U6 Norms/social capital* (trust and reciprocity)</td>
<td>Lacking</td>
<td>Moderate levels</td>
<td>Moderate levels</td>
</tr>
<tr>
<td>U7 shared local knowledge-mental models*</td>
<td>Moderate levels</td>
<td>High levels</td>
<td>High levels</td>
</tr>
<tr>
<td>U8 Importance of resource* (dependence on resource)</td>
<td>High</td>
<td>Very high</td>
<td>Very high</td>
</tr>
<tr>
<td>U9 Technology used</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
</tbody>
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# Second tier variables in SES related to community pastures in Rajasthan

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</tr>
</thead>
<tbody>
<tr>
<td>I1 Harvesting levels of diverse users</td>
<td>No fixed allocation</td>
<td>No fixed allocation</td>
<td>No fixed allocation</td>
</tr>
<tr>
<td>I2 Information sharing among users</td>
<td>Lacking</td>
<td>Mostly lacking</td>
<td>Lacking</td>
</tr>
<tr>
<td>I4 Conflicts among users</td>
<td>Yes</td>
<td>Yes</td>
<td>Mostly absent</td>
</tr>
<tr>
<td>I5 Investment activities</td>
<td>No community investment</td>
<td>No community investment</td>
<td>No community investment</td>
</tr>
<tr>
<td>I6 Lobbying activities</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>I7 Self-organizing activities</td>
<td>To some extent</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>O1 Social performance measures (e.g., efficiency, equity, accountability, sustainability)</td>
<td>Used as open access but biased in favour of large ruminant keepers</td>
<td>Used as open access but biased in favour of large ruminant keepers</td>
<td>Used as open access</td>
</tr>
</tbody>
</table>
Community’s perception on existing management systems of CRPs in Raj

Indicators for design principles for sustainable management of CPRs, Ostrom (1990)

1. CPRs boundaries well defined
2. Users clearly defined.
3. Use rules decided as per local conditions
4. Benefits are proportional to cost
5. Affected members can participate in modifying rules
6. Monitors are present and audit CPR conditions & users behavior
7. Users violating rules to face graduated sanctions
8. Mechanism to resolve conflicts
9. People find local solution to rules imposed by Govt.
10. Panchayat have linkage with next level for CPRs issues
11. All users are treated fairly
12. Rules are flexible to changing conditions
13. People/panchayat have knowledge/interest to develop CPRs
14. Leadership volunteered in the interest of whole group
15. Current plan address long term concerns
16. Economic benefits are sufficient to invest time to manage CPRs
Key second tier variables in SES as drivers of CPRs degradation

- Lack of clarity of boundaries
- Poor monitoring (low involvement of hamlet/ no interest of panchayat)
- Inflexible rules
- Very-low productivity
- Inequity in access
- Heterogeneity of group interests
- Lack of involvement of smallholders and women
Reasons for degradation of Common Silvi-Pastures, n= 180

1. Increased livestock population
2. Encroachment
3. No interest of Panchayat
4. Longer dryspells
5. Weakening of traditional institutions
6. Absence of management (open access)
7. Decreased frequency of outmigration
8. People get selfish-greater extraction
9. Unilateral NRM works, road, affect rainwater availability

Other factors which emerged from group discussion:
- Native seed system destroyed due to over grazing
- No linkage with agriculture department
- Panchayat raj department does not have expertise & agriculture deptt no involved
- Social dilemma (farmers behavior)- short term view
- Exclusion of some groups by vested interests
Community perception on ways for sustainable management of CPRs (n=180)

1. Capacity building of livestock keepers
2. Planting more trees and grasses (fast growing & profitable)
3. Support for after care of CPRs
4. Plant trees on the side of ponds/lakes
5. Conserving water in CPRs
6. Cleaning bushes
7. Stop open grazing
8. Elect representative committee at hamlet level
9. Make commonly agreed bye-laws
10. Opportunity for all to participate in decision making
11. Solicit participation of all sections in development
12. Ensure enforcement of rules
Ex-ante analysis and facilitating self organization & capacity at different levels

- Review of long term studies on silvi-pasture systems in the same region reported by CAZRI, 2009
- Ex-ante analysis with improved management- yield potential of 4-5 times
- Facilitating collective action and self organization at different level:
  - Multi-stakeholder innovation platform (districts/region level)
  - Village development committee (village level)
  - Pasture development committee (hamlet level)
  - Women sub committee (pasture level)
Institutionalizing governance for sustainable management of silvo-pasture systems

- Case study analyses and the group discussions as a starting point for facilitated community elaborations on institutional arrangements and especially by-laws (gave sufficient time)
- The opportunities and challenges of sustainable intensification of community based pasture systems included
- Community identifies 10 ha degraded common pastures each with NOC from Panchayat to test silvi-pasture rehabilitation options
- Community prioritize the economically important local species for pasture using participatory Mozer-framework matrix
Institutionalizing governance for sustainable management of silvo-pasture systems

- Agreement to manage CPRs at helmet level instead of village
- Village development committee (VDC) formed representing all groups including women
- Common agreed bye-laws prepared and in place, with contribution and benefits for all groups
- Sub-committee of women livestock keepers- for managing harvesting & distribution
- Integrated fruit plants for greater income to the committee
- Sustainability fund created from contribution and sale of grass, grass seed and fruits
- No open grazing
- Only tree loping
- Village old person hired for security of CPRs
Conflict arise at the time of harvesting of biomass:

- Often people were not ready for cut & carry system
- Pasture in Oran (pasture with temple): Committee wanted the grass for temple
- Many member wanted open grazing (esp. small ruminant keepers)
- Non-livestock owners have no participation, but they are important for protection
- People are not ready to buy nutritious grass even at significantly low price
What happened

Through an iterative process, the community agreed to adopt a fixed quota system

Member share:
Member harvest 3 bundles of grass: 2 bundle for member and 1 bundle for managing committees

Three communities has started managing the SPS proactively

Women sub committee plays an important role

Now Committee decides to use the sustainability funds for security person and watering tree plants during summers and expanding the area under SPS

All groups of village livestock keepers including women involved in decision making

Increased awareness on the benefits of common pasture management for livestock as well down stream agriculture farms
Conclusions

- Sharing information with community on benefits of CPRs and managing it collectively to address social dilemma
- Enhance biomass productivity to make CPRs economically viable
- Integrating more profitable species into the CPRs
- Capacity strengthening of stakeholders on improved practices
- Engaging all sections of the village through representative VDC, etc
- Platform to raise concern for any conflict management
- Fairness in distribution of benefits
- All members should get their share even if they are not livestock keepers
- Panchayats hardly have any interest, the CPRs should be managed at helmet level by local committee
- Relevant agricultural department should be given responsibility of CPRs management & improvement
  - Nurturing inclusive institutional mechanism (village to regional level) is critical to strengthen the capacity of the community & stakeholders for increased adoption of innovations for improved livelihoods
  - Creating feedback mechanism to enable favorable policy environment
Conclusions

• Relevant agricultural department should be given responsibility of CPRs management & improvement (Current Panchayati raj department does not have capability to manage CPRs)
  ▪ Nurturing inclusive institutional mechanism (village to regional level) is critical to strengthen the capacity of the community & stakeholders for increased adoption of innovations for improved livelihoods
  ▪ All stakeholders should be given equal opportunity to participate in the governance structure. It should not only be dominated by the voluntary participants ready to join it in early phase of CPRs development.
  ▪ Creating feedback mechanism to enable favorable policy environment
Thank You