Exploring the role of provisioning services in households’ response to vulnerability in the dry woodlands of Venda, South Africa

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Introduction:

- Rural HH in South Africa described as inherently vulnerable - exposed to a wide range of stressors
- Increasing recognition of how climate change may exacerbate existing vulnerabilities
- At the same time, many HH are considered adept managers of vulnerability, coping and adapting to shifts in their vulnerability context
- Most rural HH derive some benefits from their surrounding ecosystems
- The Millennium Ecosystem Assessment grouped ecosystem services into 4 broad categories:
  - Supporting (e.g. crop pollination)
  - Regulating (e.g. carbon sequestration)
  - Cultural (e.g. spiritual benefits)
  - Provisioning (e.g. food, water, energy, raw materials, medicinal resources, genetic resources & ornamental resources)
- This research explores the role of these provisioning services in the livelihood, coping and adaptation strategies of HH in Venda
Local livelihoods - past adaptation?

* p < 0.001
Vulnerability & coping - an example

- Various aspects of household & community vulnerability were explored
- Coping strategies were explored

Unanticipated vulnerability

- Total
- Natural disaster
- Social event
- Illness/injury
- Increase in dependents
- Death
- Land lost
- Infrastructure/assets lost
- Loss of wages
- Loss of remittances
- Business failure
- Livestock pests/diseases
- Livestock loss
- Crop pests/diseases
- Crop failure

Coping strategies

- Kinship
- Savings
- Ext. assist - Govt.
- Casual labour
- Reduced HH spend
- Reduced meals
- NTFPs
- Ext. assist - NGOs
- Sold livestock
- Loan
- Migrate
- Sold assets
- Nothing

* p < 0.001
Vulnerability & coping - an example

Impact chain exercise conducted together with problem & solution tree exercises. Allows for identification of the impact, its causes & possible solutions.

E.g. shortage of drinking water → **internal intervention** → people dig wells (TEK) OR hire water tankers

E.g. shortage of grazing → **internal intervention** → cut fences for Madimbo & KNP OR **external intervention** → apply for govt. fodder (insufficient)

**What role for provisioning services:** Medicinal plants, wild foods, fuelwood & fodder

**Challenges:**
1. NTFP availability affected esp. medicine, fruit, reeds
2. Grass dies (fodder & roofing material), exacerbated by overgrazing & increased wild fires → risk to KNP
3. Collecting wild foods difficult - energy expenditure
## Possible solutions to drought & flood impacts

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Impact</th>
<th>Adaptation</th>
<th>External</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>Crop failure</td>
<td>Install shade nets</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Drought</td>
<td>Crop failure</td>
<td>Improved seed storage</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Drought</td>
<td>Crop failure</td>
<td>Dry &amp; store crops &amp; <strong>NTFPs</strong></td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Drought</td>
<td>Crop failure</td>
<td>Irrigate, mulch, etc.</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Livestock death</td>
<td>Collect &amp; store fodder</td>
<td></td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Livestock disease</td>
<td>Use medicinal plants</td>
<td></td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>No drinking water</td>
<td>Install/dig boreholes (TEK)</td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No drinking water</td>
<td>Maintain trees near water sources</td>
<td></td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Flood</td>
<td>Roads &amp; bridges washed away</td>
<td>Govt. needs to improve construction - ask community on flood levels</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Flood</td>
<td>Houses collapse</td>
<td>Improved building construction &amp; materials</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Malaria</td>
<td></td>
<td>Improved run-off (puddles)</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Soil erosion &amp; landslides</td>
<td>Maintain trees &amp; control burns</td>
<td></td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>
Some preliminary take home messages:

- Provisioning ecosystem services, including NTFPs, contribute to rural livelihoods: day-to-day & during periods of increased vulnerability (incl. droughts & floods)

- There are constraints to the contribution of provisioning ecosystem services - e.g. over-harvesting, land conversion & expropriation, loss of TEK, seasonal availability, illegality, lack of markets, etc.

- Provisioning services are not sufficient in isolation but rather as a suite of responses

- Provisioning services & their contribution to vulnerability reduction, need to be kept in mind when planning for adaptation - adaptation for ecosystems and ecosystems for adaptation

- People have experience & knowledge that needs to be used → past adaptation, existing strategies, future options

- Internal (household & community) adaptation needs to be recognised & supported by external inputs

- Ongoing, incremental adaptation may be a short-term solution to a long-term problem...
Acknowledgements