The potential costs and benefits of addressing land degradation in the Thukela catchment, KwaZulu-Natal

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Overview

- Important water catchment, threatened by land degradation
- Scenario based approach
Main issues in study area

- Reduced vegetation cover and gully erosion
- Bush encroachment
- Invasive alien plants (IAPs)
Conceptual framework

- **Cumulative degradation (km²)**
- **2000**
  - Past degradation
  - SDG Degradation Reference Year
- **2015**
  - Reduced degradation trajectory
  - LDN Baseline Year
- **2030**
  - Avoided BAU trajectory
  - LDN Target
  - LDN Target deadline

- Area requiring offset through restoration
- Degradation avoided through implementation of SLM
Delayed start means bigger area to offset

Cumulative degradation (km²)

- Past degradation
- Avoided BAU trajectory
- Reduced trajectory

- Degradation avoided through implementation of SLM
- Area requiring offset through restoration

2000 2015 2021 2030

SDG Degradation Reference Year
LDN Baseline year
LDN Implementation year
LDN Target deadline
• Estimation of the baseline land cover, trajectory to 2030 under BAU and resulting land cover, and the restored land cover

• Modelling of ecosystem services under BAU, LDN and restored outcomes
  • Same methods as Pilot, including SWAT model

• Costs and benefits of interventions compared with BAU Scenario
  • Costs of interventions based on literature, previous studies
  • Benefits estimated as difference in value of ecosystem services compared to BAU outcome
Cost-benefit analysis

<table>
<thead>
<tr>
<th>Costs relative to BAU</th>
<th>LDN Scenario</th>
<th>Full Restoration Scenario</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Upper bound costs</td>
<td>Lower bound costs</td>
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<tr>
<td>Clearing IAPs</td>
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<tr>
<td>Addressing Bush Encroachment</td>
<td>507.2</td>
<td>237.6</td>
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<tr>
<td>Active restoration of grasslands, erosion</td>
<td>2 623.6</td>
<td>–</td>
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<td>Sustainable land management</td>
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<td><strong>Total present value of costs</strong></td>
<td><strong>3 645.18</strong></td>
<td><strong>2 733.09</strong></td>
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<td>Benefits relative to BAU</td>
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<td>Water supply</td>
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<td>Sediment retention</td>
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<td>Tourism</td>
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<td>Carbon storage (avoided national cost)</td>
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<td>Harvested resources</td>
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<td>Livestock production</td>
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<td><strong>Total present value of benefits</strong></td>
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<td><strong>Net Present Value</strong></td>
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<td>BCR</td>
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Conclusions

- Benefits of LDN depend on effective implementation of SLM measures
- Need to go beyond LDN and restore of previously-degraded grasslands
- Results do not include values of biodiversity, to RoW;
- Delay has already come at significant cost, don’t delay
- Mapping degradation is difficult, need to do it properly
Thank you

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