Farmers' investments in land management in the Central Rift Valley of Ethiopia

Zenebe Adimassu¹,², Aad Kessler ²

¹Ethiopian Institute of Agricultural Research, Addis Ababa, Ethiopia, ²Land Degradation and Development Group, Wageningen University
Outline

- Background
- Problem definition and objectives
- Methodology I, Results- I
- Methodology II, Results- II
- Conclusions
Background: Central Rift Valley (CRV)

- CRV = 1.3 Million ha, population ≈ 1.5 Million
- Two Administrative regions: Oromia and SNNP
- Agriculture predominantly rain-fed
  - Land degradation
    (water erosion & soil fertility depletion)
  - Unreliable rainfall
  - Limited use of improved technologies
- Land productivity is very low
Irrigation agriculture is constrained by water shortage due to:
- Floriculture and horticulture farms
- Recreations areas
- Parks
- Climate change

Therefore, improving rain-fed agriculture is crucial.
Problem definition and objectives

- Investments in land management are required to overcome low productivity and frequent crop failure

- Land management investments are effort made by farmers in order to control water erosion and soil fertility depletion
  1. water erosion control → soil/stone bunds
  2. soil fertility control → organic and inorganic fertilizers

- However, farmers’ investments in land management are quite limited in the CRV of Ethiopia

Why?
Problem definition and objectives

Therefore, three objectives:

- explore farmers’ perceptions of land degradation (water erosion and fertility depletion)

- Test the association between farmers’ investments in land management and their perception of land degradation, and

- identify factors that determine farmers’ decisions concerning how much to invest in land management practices.
Methodology I

- Oromia region
- SNNP region
- AJK wereda
- SNNP region
- Meskan wereda

- 6 kebeles
- 240 hh

- KI interview
- Focus group discussion
- Observation
- Household survey
### Methodology

<table>
<thead>
<tr>
<th>Investments</th>
<th>Perceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments in water erosion control (yes/no)</td>
<td>Do farmers perceive water erosion as a problem? (yes/no)</td>
</tr>
<tr>
<td>Investments in fertility depletion control (yes/no)</td>
<td>Do farmers perceive soil fertility depletion as a problem? (yes/no)</td>
</tr>
</tbody>
</table>

Ch-square test of association
Results I: farmers’ perception

(a) Do farmers perceive water erosion as a problem?

(b) Do farmers perceive soil fertility depletion as a problem?
Results I: farmers’ investments

- Water erosion control: 30% of farmers
- Fertility control: 80% of farmers
- Land management investment: 10% of farmers
Results I: farmers’ perception Vs investments

Do farmers’ perceptions matter?

Chi-square analysis of these data showed **no association** between perception and investments in land management practices; even not for soil fertility control measures,

What other factors affect farmers’ investments?
Methodology II

HH survey

All investments were standardized into ETB at plot level (n=738)

Aggregate into household level (n=240)

Categorize household characteristics (1-3)

Categorize household level investments (1-3)

Factor Analysis

Pearson correlation
Results II: Factors affecting farmers’ investments
<table>
<thead>
<tr>
<th>Household characteristics</th>
<th>Resources endowment</th>
<th>Experience and knowledge</th>
<th>Access to information</th>
<th>Social capital</th>
<th>Availability of family labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land per EAFM</td>
<td>0.788</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land fragmentation</td>
<td>0.747</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land size</td>
<td>0.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land per capita</td>
<td>0.738</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livestock size (TLU)</td>
<td>0.737</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TLU per capita</td>
<td>0.695</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of oxen</td>
<td>0.605</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>0.859</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farming experiences</td>
<td></td>
<td>0.842</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>-0.725</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance to DA's office</td>
<td></td>
<td></td>
<td>0.932</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance to Wereda town</td>
<td></td>
<td></td>
<td>0.514</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatives within Kebele</td>
<td></td>
<td></td>
<td></td>
<td>0.724</td>
<td></td>
</tr>
<tr>
<td>Relatives outside Kebele</td>
<td></td>
<td></td>
<td></td>
<td>0.562</td>
<td></td>
</tr>
<tr>
<td>Friends within Kebele</td>
<td></td>
<td></td>
<td></td>
<td>0.546</td>
<td></td>
</tr>
<tr>
<td>Migration</td>
<td></td>
<td></td>
<td></td>
<td>0.496</td>
<td></td>
</tr>
<tr>
<td>Friends outside Kebele</td>
<td></td>
<td></td>
<td></td>
<td>0.429</td>
<td></td>
</tr>
<tr>
<td>Family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economically active family</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rotated component matrix for the household characteristics (n=240)
Results II: Factors affecting farmers’... Pearson correlation coefficients of household level factors with investments in land management

<table>
<thead>
<tr>
<th>Factors</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources endowment</td>
<td>0.216**</td>
</tr>
<tr>
<td>Access to information</td>
<td>0.154*</td>
</tr>
<tr>
<td>Social capital</td>
<td>0.156*</td>
</tr>
<tr>
<td>Family labor</td>
<td>0.239**</td>
</tr>
<tr>
<td>Experience and knowledge</td>
<td>0.026</td>
</tr>
</tbody>
</table>

* Correlation is significant at 0.05 level (two-tailed),
** Correlation is significant at 0.01 level (two-tailed)
Conclusion

Significant proportion of farmers perceive that land degradation in the form of water erosion and soil fertility decline is a problem on their plots.

Nevertheless, farmers’ awareness of both water erosion and soil fertility decline as a problem is not significantly associated with their investments in land management.

Farmers investments are influenced by the households’ resource endowments, access to information, social capital and availability of family labor.
conclusions...

Of these factors, *households’ resources endowment* is a major factor that determines investments in land management.

Therefore, land management strategies should be integrated within a comprehensive rural development strategy that improves farmers’ livelihoods and their *financial capacity*.

The use of *community mobilization* for land management activities requiring much labour is crucial.

More effort is need to involve *Development Agent* in promoting land management technologies.
Thank you!