What is influencing agroforestry adoption among smallholder farmers in Zambia?

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Outline

- Objective of research
- Background to agroforestry
- Theoretical concepts
- Methodology
- Findings
- Practical implications
- Conclusion
Background to agroforestry

- Increased population
  - Short fallows (< 5 yrs)
  - Intensification
  - Forest degradation

Decrease

- Soil nutrient balance
- Agricultural productivity

Interventions

- Inorganic fertilizers
- Animal manure
- Crop rotation
- Agroforestry techniques

Increase

- Household welfare
- Food security
- Income

Decline

YES

NO
Improved fallows

Gliricidia sepium fallow

Sesbania sesban fallow

Tephrosia vogelli fallow

Gliricidia-maize intercrop

Source: ICRAF, 2007. Photos taken in Chipata and Petauke Districts at farmers fields
Grass fallow

Maize crop – poor growth

Fertilised maize crop

Felled Tephrosia vogelli

Source: ICRAF, 2007. Photos taken at farmers fields in Chipata
Biomass transfer

• Trees/shrubs planted as an improved fallow or periphery of garden

• Leaves harvested and transported to site

• Application at site of crop growing
Biomass transfer system
Objectives of research

- Determine the level of adoption of improved fallows and biomass transfer
- Identify and assess factors influencing adoption of these technologies
Theoretical concept:
Adoption and diffusion model

Perceived attributes of innovations
Types of innovation decisions
Communication channels
Nature of the social system
Extent of change agent’s promotion efforts

Rate of adoption of innovations

Method

- Data - Household interviews
- 388 households in eastern Zambia
- Adoption measurement at 2 levels
  - Trialing
  - Adoption
- Chi-square tests of independence
- Strength tests – phi or Cramer’s V (Field, 2005; Pallant, 2007; Bryman & Cramers, 2009)
Results
<table>
<thead>
<tr>
<th>Adoption levels</th>
<th>Improved fallows</th>
<th>Biomass transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Of overall sample</strong></td>
<td>N=388</td>
<td>N=388</td>
</tr>
<tr>
<td>Never trialed</td>
<td>55.2%</td>
<td>78.6%</td>
</tr>
<tr>
<td>Trialed</td>
<td>44.9%</td>
<td>21.4%</td>
</tr>
<tr>
<td><strong>For those who trialed</strong></td>
<td>N=174</td>
<td>N=83</td>
</tr>
<tr>
<td>Adopted</td>
<td>73.6%</td>
<td>89.2%</td>
</tr>
<tr>
<td>Stopped</td>
<td>26.4%</td>
<td>10.8%</td>
</tr>
</tbody>
</table>
Factors influencing adoption

• Trial stage
  – Trialed a technology
  – Did not try

• Continuance stage (of those who trialed)
  – Adopted (continued use)
  – Discontinued
Factors influencing agroforestry adoption

Figures do not add to 100% because respondents could select more than one
Factors influencing adoption of improved fallows

**Trialing**
- Gender
- Age
- Club membership
- Farming experience
- Lack of skill
- Lack of knowledge
- **Lack of seed**
- **Lack of interest**
- Lack awareness

**Continuance**
- Non-farm income
- Method of plowing
- Land limitation
- **Lack of seed**
- **Lack of interest**
Factors influencing adoption of biomass transfer

- Club membership
- Income from livestock sales
- Method of plowing
- **Land limitation**
- Lack of skill
- Lack of knowledge
- **Lack of seed**
- Lack awareness

**Trialing**

**Continuance**

- Land limitation
- Lack of seed
- Lack of interest
Practical implications

Results suggest that:

• Different factors need to be focused on at different stages in the adoption process.
• Institutional factors such as land tenure are important.
• Resources such as seed availability are important.
• Emphasize factors influencing decision to trial when designing dissemination programs.
Conclusion

• Trialing of agroforestry technologies is low
• Continuance rate after trialing is high
• Various factors influence the decision to trial an agroforestry technology and to continue using it
  – A key factor is lack of seed as it influences both the decision to trial and to continue improved fallows and biomass transfer
  – Land issues and land owner interest also important
• Main issue is to get farmers to trial these technologies
Thank you
### Chi-square test results - trialing

<table>
<thead>
<tr>
<th>Variable</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>( P )</th>
<th>Phi/ Cramer's V</th>
<th>( \chi^2 )</th>
<th>df</th>
<th>( P )</th>
<th>Phi/ Cramer's V</th>
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<tbody>
<tr>
<td>Gender</td>
<td>4.305</td>
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<td>2.262</td>
<td>1</td>
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<tr>
<td>Age</td>
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<td>0.016</td>
<td>0.177</td>
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<td>0.083</td>
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<td>Income from livestock sales</td>
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<td>18.498</td>
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<td>Non-farm income</td>
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<td>Farming experience</td>
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<td>0.305</td>
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<td>Previous land use</td>
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<td>Lack seed</td>
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</table>
### Chi-square test results (adoption)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Continued practice</th>
<th>Improved fallow</th>
<th>Biomass transfer</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>df</td>
<td>P</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>0</td>
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<td>0.871</td>
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<tr>
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<td>Income from livestock sales</td>
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<td>Non-farm income</td>
<td>6.707</td>
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