Factors influencing trialing of agroforestry in smallholder farming in Zambia

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Introduction

Research has shown that agroforestry has potential to improve land productivity and increase crop yields to enable subsistence farmers move out of poverty. In addition, implementing agroforestry would reduce pressure on existing forests and curb forest destruction. However, despite research and extension efforts, not many farmers have adopted agroforestry technologies. In Zambia, agroforestry research started in the late 1980's and was introduced on-farm in 1992 and through extension in 1997. We investigated the influence of household and institutional factors on trialing and adoption of agroforestry technologies. Agroforestry has the potential to address land productivity, to increase crop, tree and fodder production, and address immediate food needs. It also has capacity to ameliorate the environment, and increase farmer's incomes. Despite its potential, it has low adoption rates. These possibilities have persuaded various extension organisations to promote agroforestry.

Agroforestry technologies in Zambia

A number of techologies have been developed and promoted.

- Improved fallows
- Biomass transfer
- Fodder banks
- Woodlots
- Domestication and commercialization of indigenous fruits

Fig. 1. Examples of agroforestry species grown in farmers fields (a) *Sesbania sesban* (b) *Gliricidia sepium* (c) *Cajanus cajan* (d) *Tephrosia candida*

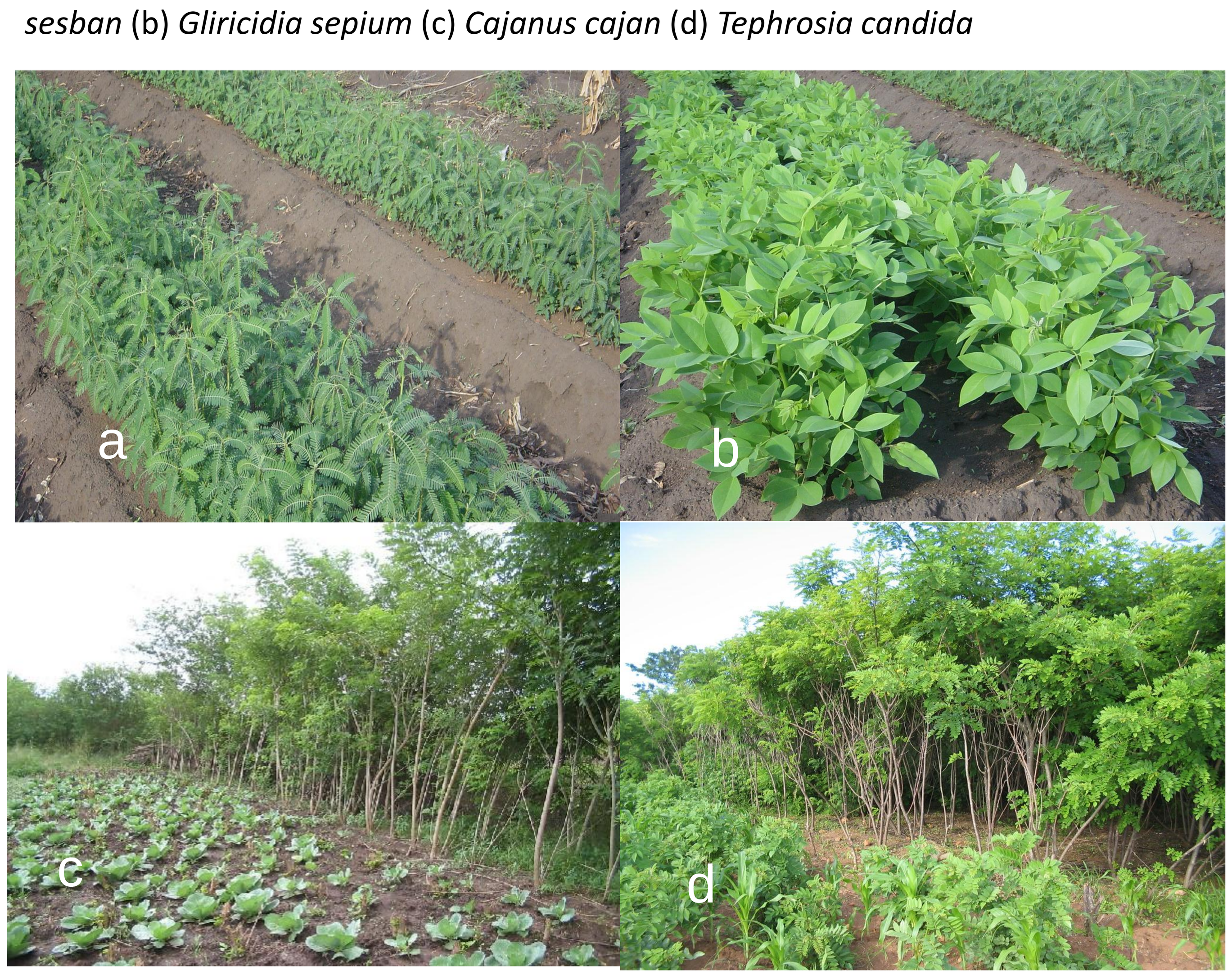


Fig. 2. Examples of agroforestry farmer practices (a) *Sesbania sesban* seedlings (b) *Gliricidia sepium* seedlings (c) *Garden with biomass transfer practice* (d) *Intercrop of Gliricidia and maize with seed orchard in periphery of field*

Methods of data collection and analysis

Personal interviews of 388 smallholder farmers in four districts of Eastern Province during 2008.

Multi-stage sampling was used for selecting farmers, whereas purposeful selection was used for selection of districts and agricultural camps in consultation with head of village and agricultural personnel. Random selection was used to select villages and farmers within an agricultural camp.

Questionnaires with both structured and unstructured questions were used to collect data. Informal discussions were held with some key informants.

Data analysis used SPSS 15. Statistical methods included: descriptive statistics; chi-square test of independence and Logistic regression analysis. ANOVA was used for the separation of means for extension approaches and extension agents.

Chi-square test of independence was used to select variables for logistic regression models. Cross tabulations were derived. Discussion of results are therefore based on the logistic regression analysis.

Logistic regression was analyzed at two stages: 1. Trialing; and 2. Adoption (continuance). Trial stage comprised those who trialed and those who did not; whereas the adoption group included farmers who have trailed and were categorized as 'adopted' if they had continued with use of practice or 'stopped' if they discontinued use of the technology.

Results

Household characteristics

- 60% of respondents aged 26-45 years, with 15% having no schooling and 63% primary education
- 91% depend on farming as livelihood source
- Average farm size of x ha and 78% of farmers cultivating by hand hoes
- Cattle and small ruminants?

Use of Agroforestry Technologies

- Trialling generally low but improved fallows and biomass transfer most common (Table 1)
- High rate of adoption among those who trial a technology

Table 1: (a) Trialling of agroforestry technologies. n=388 for each technology comprising the groups 'never trialled' and 'trialled'. (b) Adoption of agroforestry technologies *with variable number of respondents)

	Agroforestry technologies (%)				
	Improved fallows	Biomass transfer	Woodlots	Fodder banks	Indigenous fruit trees
a. Within the overall sample					
Never trialled	55.2	78.6	96.9	96.1	95.6
Trialled	44.8	21.4	3.1	3.9	4.4
b. Within the group who trialled a technology					
Adopted	73.6	89.2	91.7	80	82.4
Stopped	26.4	10.8	8.3	20	17.6
	n=174*	n=83*	n=12*	n=15*	n=17*

Factors limiting Trailing

- Lack of seed a key factor (Table 2)

Table 2: Factors that limit the trialling of (a) improved fallows, and (b) biomass transfer

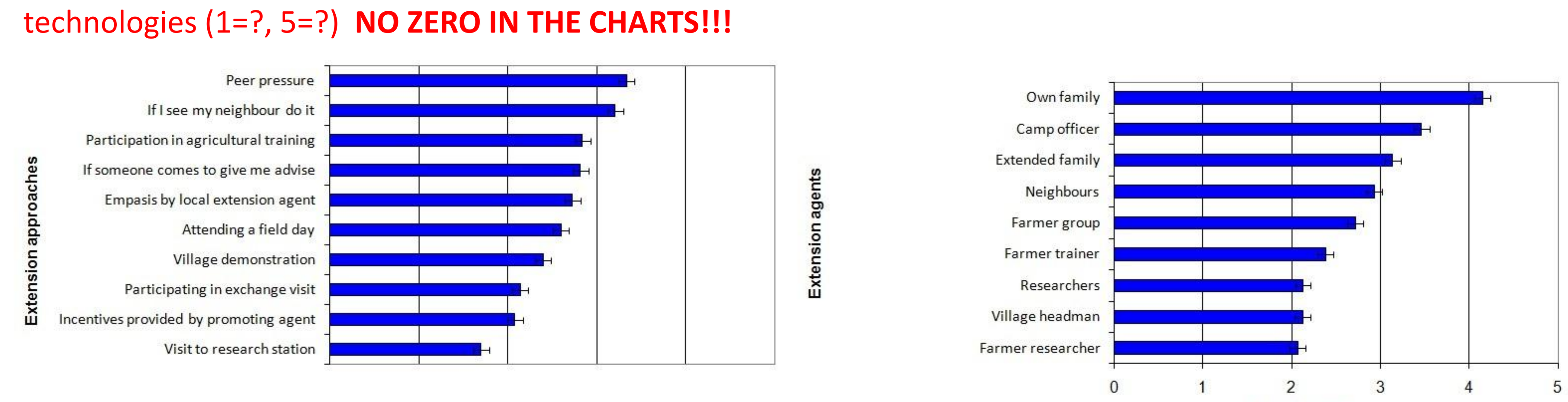
(a) Trialing of improved fallows
- **Lack of seed**
- **Lack of interest**
- Lack of skill
- Agriculture extension officer as information source
- Gender
- Income from livestock sales

(b) Trialing of biomass transfer
- **Lack of seed**
- Lack of knowledge
- Visits to extension
- Visits by extension
- Radio as information source
- Owning a garden
- Club membership

Primary Extension Factors

- The main extension approaches that people respond to are peer pressure or what neighbours do
- The primary extension agents are family members and the camp officer

Fig. 4. Mean scores of extension approaches and extension agents used for promoting agroforestry technologies (1=?, 5=?) **NO ZERO IN THE CHARTS!!!**



Conclusions

Trialing of agroforestry technologies is low but 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 both improved fallows and biomass transfer. Land owner interest in the technology is also important. Different factors need to be focused on at different stages in adoption. For example, extension is important at trialing stage but once farmers trial it becomes irrelevant. Factors that influence trialing need to be emphasized when designing extension programs.

The main issue is to get farmers to trial these technologies.

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Acknowledgments

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For further information

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