



# WOODY PLANTS IN SMALLHOLDERS' FARM SYSTEMS IN THE CENTRAL HIGHLANDS OF ETHIOPIA: A DECISION AND BEHAVIOUR MODELLING

Michael KRAUSE<sup>(1)</sup> and Holm UIBRIG<sup>(2)</sup>

## Problem statement and research rationale

- Agricultural land expansion until mid 1990s, extension by MoA to raise land productivity after mid 1990s
- Continuous cutting in natural forests for fuelwood and timber-based produce, negligible tree-based extension
- Deforestation of natural forests >1500 m.a.s.l. (~3% natural forest cover (JICA 1999))
- R&E which does not sufficiently take smallholders' decision-making processes into account
- Institutional knowledge gaps about factors actually influencing tree growing behaviour from farmer's point of view
- Little advancement in deliberate introduction of woody species in farm households



## Objectives

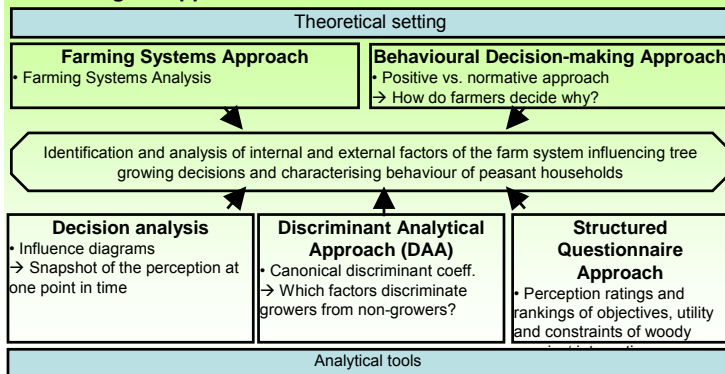
- To analyse farmers' decisions in making use of tree and shrub species under prevailing perceived constraints
- To identify and analyse influencing factors that determine deliberate tree and shrub growing behaviour



Map: Administrative location of study area/sites

Photo (Krause): Study area in Dendi district

## Methodological approaches

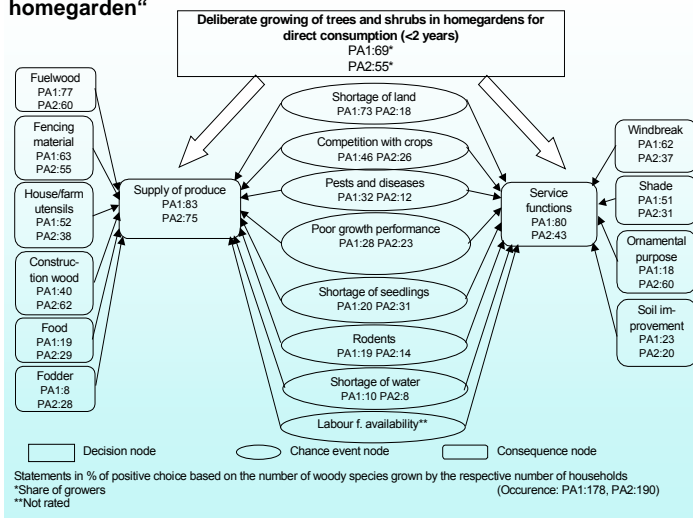


## Study sites and sampling

Village	Total number of hhs			Sample size [%]		
	Male	Female	Total	Male	Female	Total
Lanqisaa (PA1)	414	74	488	13.0	14.9	16.2
Galessa Koftu (PA2)	329	72	401	16.7	13.9	13.3
Total/ Mean value	743	146	889	14.7	14.4	14.6

- Systematic random sampling of 130 hhs (65 per village)
- Ex-post stratification (grower/non-grower)

## Results I: Decision model „Deliberate growing of trees in homestead“



## Results II: Discriminant Analysis

Variables	Homegarden	
	PA1	PA2
Group centroid, canonical discriminant eigenvalues and Wilk's λ		
Grower/ adopter	0.568	1.373
Non-grower/ non-adopter	-1.278	-1.704
Eigenvalue	0.715	2.414
Canonical correlation	0.646	0.841
Wilk's Lambda	0.583	0.293
Level of significance	0.001	0.001
Standardized canonical discriminant coefficients		
Access to extension	0.487	
Access to credits	0.508	
Use of seedlings from farm nursery		0.446
Use of wildlings from allocated land	0.730	0.750
Use of wildlings from natural forest	0.384	
Use of seedlings from market	0.481	0.856
Cash generated from SEU*capita*a		0.464
Discrimination power (% of correctly classified hhs)		
Grower/ adopter	70	94.4
Non-grower/ non-adopter	91.1	86.2
Total	84.6	90.8

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Authors' contact: Dresden University of Technology, Institute of International Forestry and Forest Products, 01737 Tharandt/ Germany; Phone: ++49-(0)35203-3831823; Fax: -3831820;

E-mail:  
(1) krause@uni-kassel.de  
(2) dnuibrig@forst.tu-dresden.de

## Conclusions

- Farmers' objective to grow woody plants in the homegarden determined by (1) means to contribute to home consumption; (2) potentiality to warrant immediate cash generation and (3) appropriateness as assets for saving purposes
- Subjectively perceived utility as driver for tree and shrub growing decisions: primarily fuelwood, timber-based produce, and cash generation; fodder negligible in homegardens
- Chief decision determinants for homegarden tree and shrub growing: perceived shortage of land resources and seedlings, the latter connected to the range of sources used
- Markets accessible: establishment of farm nurseries (purchase of seedlings) → use of wildlings outweighed → partly overcomes missing agroforestry-related extension depending on the household's cash capital endowment