

The role of aspirations and personality traits for smallholder farmers’ decision to adopt agroforestry: Evidence from Kenya

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Introduction

- Increasing pressure on existing smallholder food production systems ^[1,2]
- Rain-fed small-scale production is becoming even more challenging ^[3]
- Agroforestry provides a sustainable solution to current and emerging challenges ^[4]
- Low adoption rates of agroforestry in some areas of low- and middle-income countries ^[5]
- Aspirations can improve understanding of livelihood choices ^[6]

Research Objectives:

- Identifying the influence of personality traits on the formation of aspirations in an agricultural context
- Assessing the role of aspirations and personality traits, besides general household characteristics, in agroforestry adoption

Project

Fruit Tree Portfolios (FTP)

- Aim:** Close seasonal harvest and dietary gaps in rural smallholder farms and households, by designing fruit tree portfolios.
- location-specific fruit tree portfolios
 - year-round availability of fruits
 - delivery of key micronutrients to meet nutritional needs in local diets
- Innovation hubs:** decentralized and dynamic; demonstration plots; farmer training

Box 1. Fruit Tree Portfolios developed by World Agroforestry.^[7]

Data

- Quantitative survey in 2021 (272 households)
- Socio-economic household characteristics
- Aspirations; personality traits (Big Five); adoption

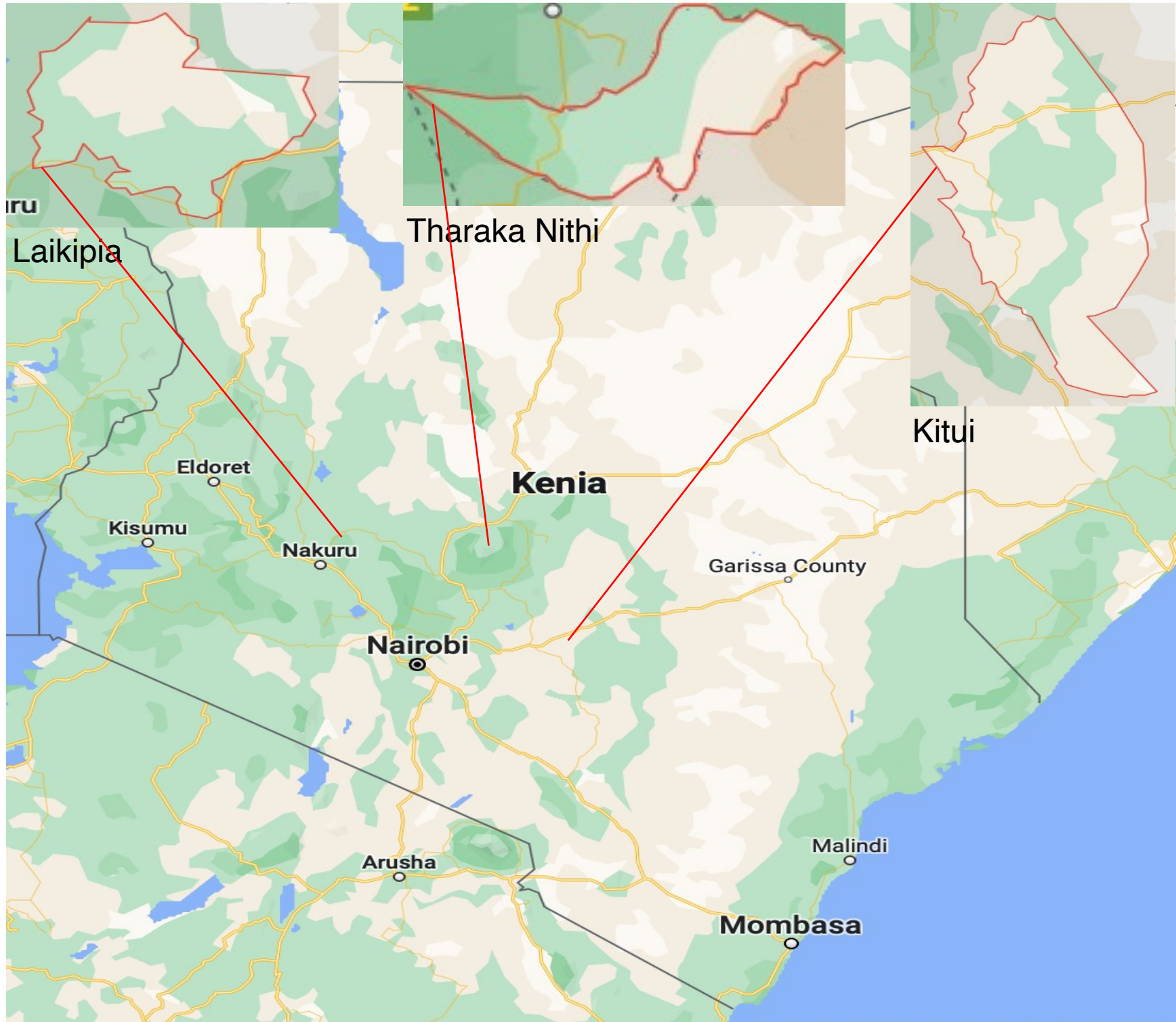


Figure 1. Study areas.

References

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Methods

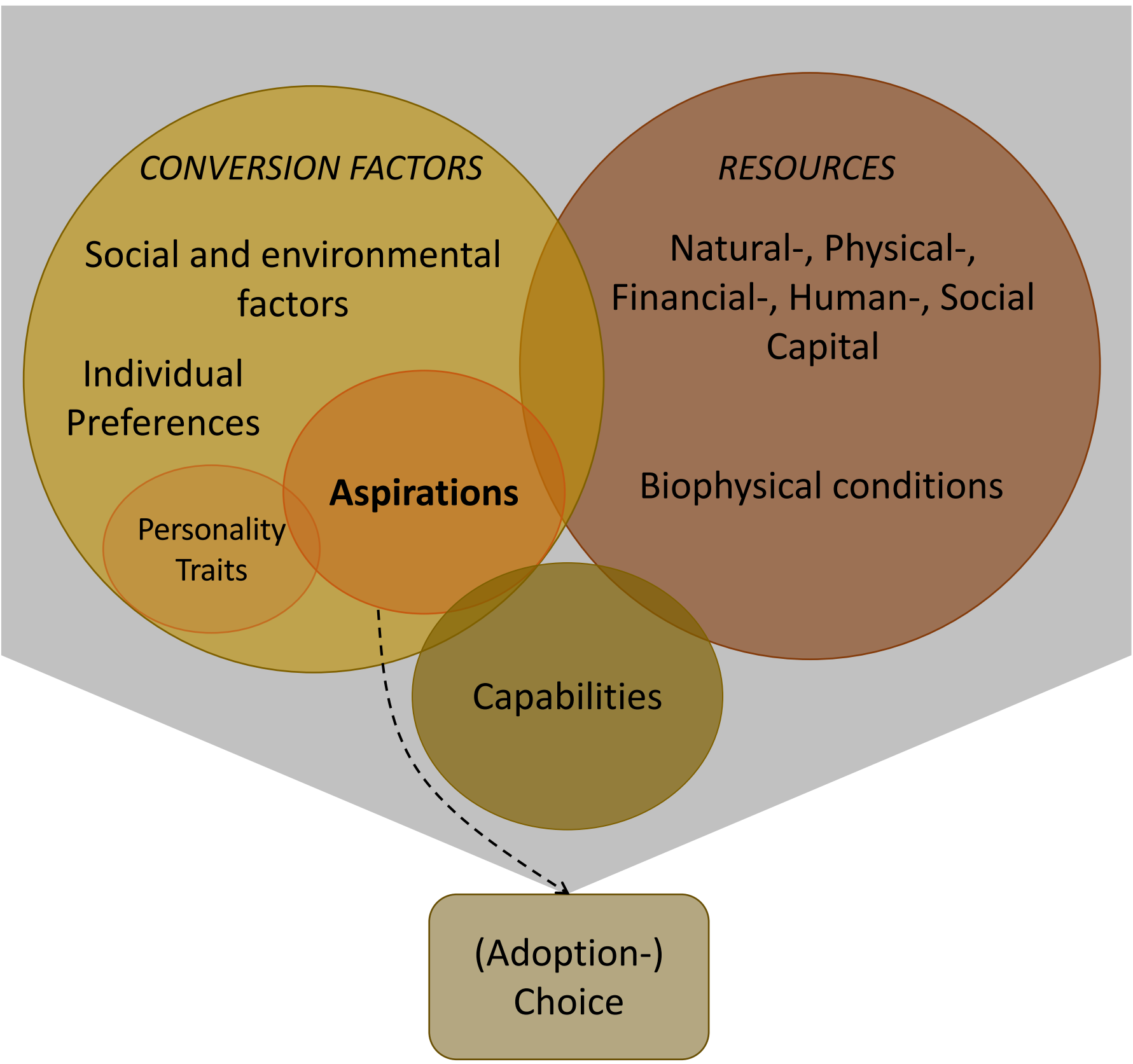


Figure 2. Conceptual Framework. Own compilation based on Mausch et al. (2021); Sen (1999).

Structural Equation Modeling (SEM)

- Confirmatory factor analysis: identification of latent variables that are prone to measurement errors
$$x_1 = \lambda_1 \xi_1 + \delta_1$$
$$x_2 = \lambda_2 \xi_1 + \delta_2$$
- Path analysis: maximum likelihood estimation

Analysis of factors associated with adoption and implementation

- Adoption decision: $0 = no ; 1 = yes$
- Adoption diversity (share of species adopted from the portfolio): $low < 15.5\% \geq high$
- Adoption intensity (share of cultivated area used for the adopted species): $low < 47.7\% \geq high$

Results

Personality traits, aspirations and adoption

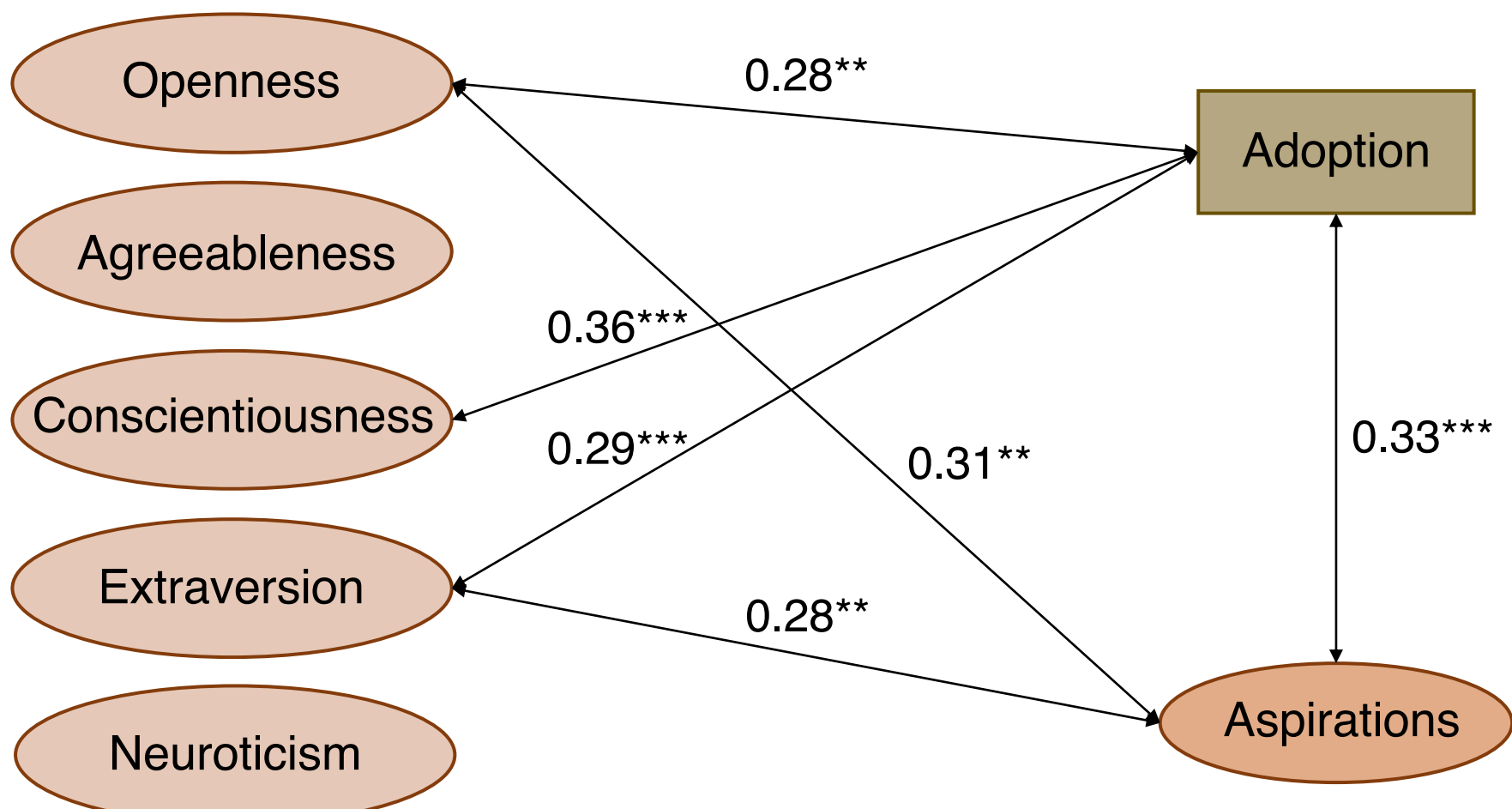


Figure 3. Results from the SEM.

- Aspirations are positively related to Openness and Extraversion
- High aspirations positively correlate with the decision to adopt
- Openness, Extraversion and Conscientiousness are also linked with adoption

Results cont.

Adoption and implementation

Table 1. Summary statistics of the three adoption variables.

Variable	Obs.	Mean	Min	Max
adoption (y/n)	227	0.72	0.00	1.00
adoption diversity	163	15.5	3.57	36.4
adoption intensity	163	47.7	0.01	100

Factors of adoption and implementation

Table 2. Household and respondent characteristics of households that adopted.

Variable	Adoption		Adoption diversity		Adoption intensity	
	no	yes	low	high	low	high
farm size (ac)	0.84	0.76	1.80	2.05	2.10	1.66**
livestock (TLU)	0.75	0.87	1.08	0.69**	0.87	0.86
monthly HH income (KSh)	6253	6050	6195	5922	6375	5513*
non-farm income (%)	76.3	59.9***	56.1	63.1*	56.9	64.7*
education HH head	3.30	3.50	3.86	3.24**	3.54	3.43
days per month outside of village	3.50	10.8***	5.90	10.0***	7.83	8.65
perception on agroforestry	3.89	3.96	3.85	4.05***	3.90	4.06**

Note: T-test/Welch mean differences, *** p<0.01, ** p<0.05, * p<0.1. HH = household, KSh = Kenya Shilling, TLU = Tropical Livestock Units

- Adopting households rely less on non-farm income
- High adoption diversity is associated with less extensive livestock keeping and lower education of the household head
- Members in households that adopted highly divers travel more frequently outside of their home village
- High adoption intensity is associated with smaller farms and lower household income
- Positive perceptions seem to be related to extensive implementation



Figure 4. Mango trees on a farm in Kitui. Own source.

Conclusion

- Agroforestry adoption is not a single event, but a process, including the implementation
- Extensive implementation of agroforestry is related to fewer resources and conversion factors play an important role
- Two out of five personality traits (Openness; Extraversion) correlate positively with aspirations
- Three out of five personality traits (Openness; Extraversion; Conscientiousness) correlate positively with the decision to adopt agroforestry
- High aspirations significantly and positively correlate with the decision to adopt agroforestry