TREE PLANTING ON FARMS IN SUB SAHARAN AFRICA AND HAITI LIVELIHOOD DIVERSIFICATION AND ENVIRONMENT

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Tree planting on farms in Sub Saharan Africa and Haiti
Livelihood diversification and environment

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OVERVIEW

International donors promote tree planting to achieve sustainable development and environmental goals. Tree planting is:

- An agricultural investment by farmers so as to improve soil fertility, to control for erosion, and to reduce wind damage
- A livelihood diversification strategy so as to have access to more food, to cash, to insure risks, and to cope with shocks

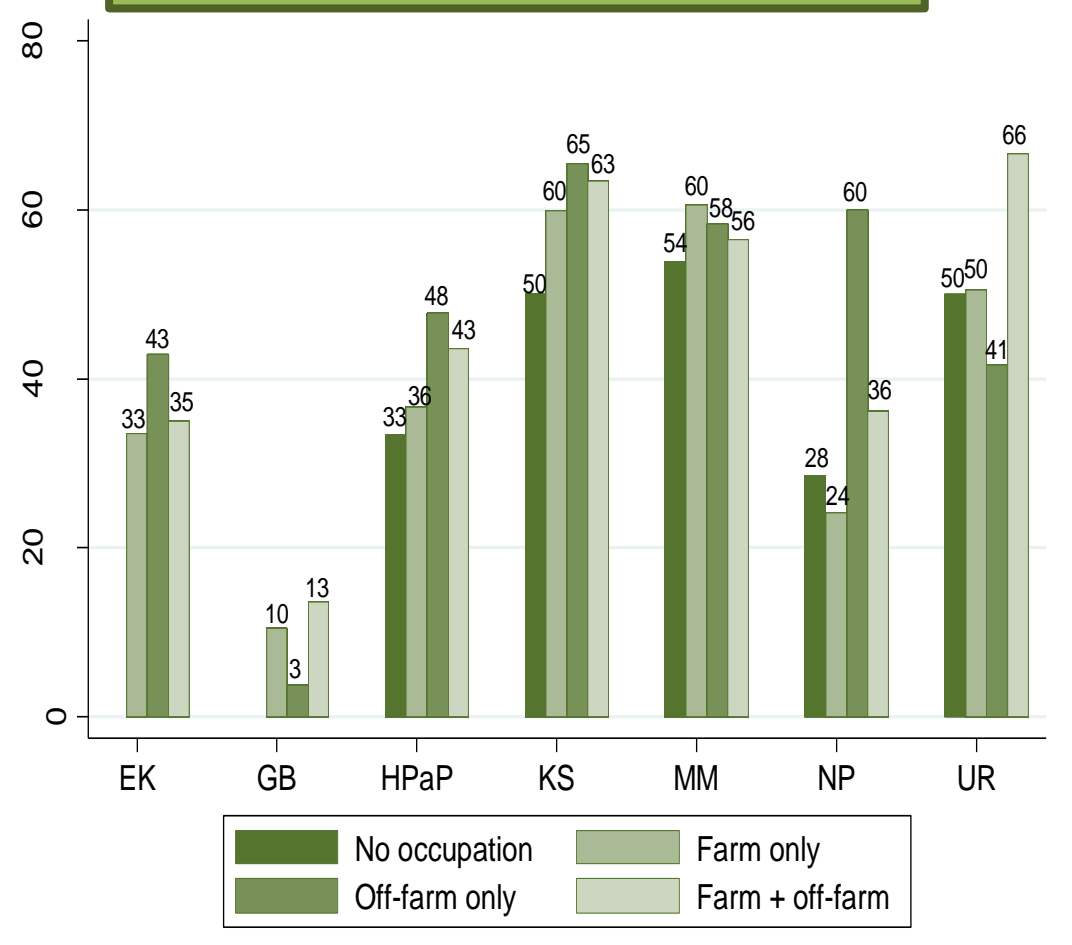**HOWEVER ADOPTION OF TREE PLANTING IS LOW**

OBJECTIVE

Identify socioeconomic and environmental factors encouraging households to plant trees on farms across seven sites

Participation & number of trees planted
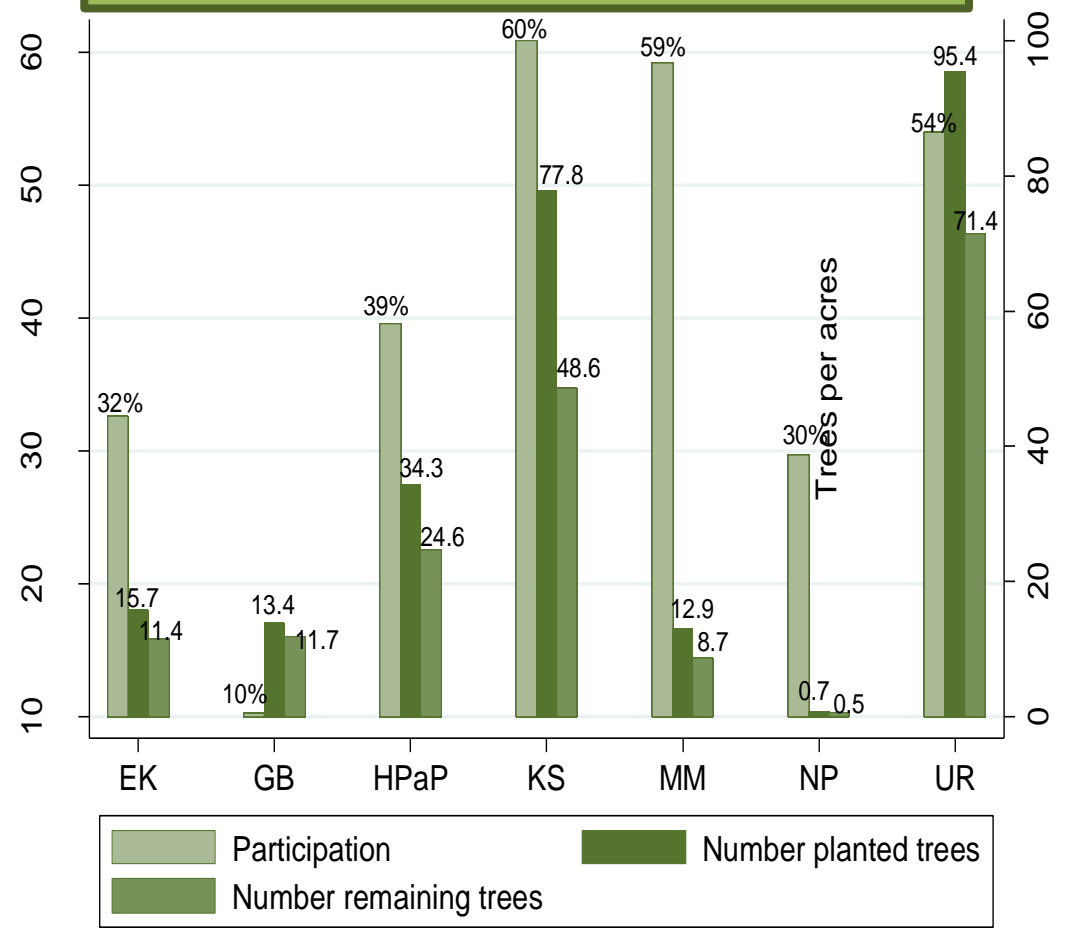
Tree planting and livelihood strategies

DATA

Socioeconomic and environmental data seven sites in seven distinct agroecological zones from years 2010/11

- Sites are in Ethiopia, Ghana, Haiti, Kenya, Malawi, Nigeria and Uganda
- Socioeconomic data come from the Millennium Village Project and are demographic, activities, agriculture, land tenure and use, and tree planting
- Environmental data is from Land Degradation Surveillance Framework, which is an intensive biophysical inventory

MODEL 1

Probit model assesses households' participation in tree planting in each village and across all villages (pooled data) taking into account household characteristics when working at the household level and both household and environmental characteristics when working at the village level (marginal effects)

Variables	Ethiopia	Ghana	Haiti	Kenya	Malawi	Nigeria	Uganda	Pooled
Elder	-0.21***	-0.0249	-0.0189	-0.19***	0.0215	-0.0504		-0.103***
Male			0.108	0.138**	-0.00937	0.159	0.145**	0.0847** *
Sec edu		0.00721		0.103*	0.0471	0.0263	0.0110	
Poor	-0.140**	-0.10***	-0.20***	-0.138**	-0.28 ***	-0.156**	-0.00928	-0.185***
Food inse	-0.141**	-0.0135		0.133**	-0.0446			-0.0207
Fuel inse	0.46***		0.0625			-0.144**	-0.0761	
Credit	0.0983	0.134*	0.0397	0.124**	0.270***	0.125**	0.117*	0.144***
Strat_4	0.0620	0.00718		-0.0792	-0.160*	0.0721	0.102	0.0125
Land size	0.00094	0.00086	0.00626	0.16***	-0.00827	0.00497	0.0613	0.00119
Own land		-0.0594	0.154**	-0.217*		0.0851		-0.0142
Nb plot		0.05***	0.0483		0.114***	-0.0332	0.0319	0.041***
Precip. >1,000mm								-0.182***
Elev. >1,000m								0.0561
Slope >20%								-0.245***
Trees 20/hhs								0.542***
Obs.	285	259	228	339	246	246	273	1,720
Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1								

RESULTS 1

Main findings are poverty and credit at village and overall sample

- Poor households less likely to plant trees than non-poor ones
- Households with credit more likely to plant trees than households without access to credit
- Off-farm + farm strategy has negative effect in Malawi
- Land size has expected positive effect only in Kenya. Land ownership has a positive effect in Haiti but negative one in Kenya
- Number of plots has expected positive effect in Ghana, Malawi and pooled data
- Households living in villages with higher precipitation levels and steeper slope are less likely to plant trees
- Better access to tree has a positive effect on tree planting

MODEL 2

Heckman model assesses households' intensity in tree planting, controlling for working with non-random sample by predicting first participation in tree planting and then explaining intensity in number of planted trees, taking into account the same characteristics at the household and village level

Variables	Ethiopia	Ghana	Haiti	Kenya	Malawi	Nigeria	Uganda	Pooled
Poor	-9.163*	-38.65***	-24.95*	-67.7***	-11.35***	-0.089	-5.884	-5.213
Fuel inse				7.410				
Credit	2.286	38.17***	3.650	43.69*	8.874**	-0.115	48.52**	15.68*
Land size	-0.0544	0.259	-0.0126	-0.270	-0.764	-0.04***	-5.815	-0.435
Nb plot				12.65				
Precip. >1,000mm								54.09***
Elev. >1,000m								23.86*
Slope >20%								8.972
Constant	-12.59***	-44.98***	-32.45*	-4.733	1.912	1.457***	102.8** *	10.62
Obs.	263	247	226	339	248	246	284	1,719
chi-square indep eqn	58.06***	35.14***	104.42***	184.89** *	115.72***	0.87	2.32	3.96**
Standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1								

RESULTS 2

Reporting only intensity of tree planting after controlling for participation main finding is credit and poverty

- Poor households plant fewer trees than non-poor ones
- Households with credit plant more trees than households without credit
- Land size has a negative effect in Nigeria
- Households living in villages with higher precipitation levels and higher elevation plant on average more trees

CONCLUSION

Poverty and access to credit are the two most important determinants explaining why households plant trees and the number of planted trees.

Environmental characteristics also important; precipitation has different effects on participation and intensity.