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Economics of Land Degradation in Eastern Africa

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Introduction

Land degradation is a serious impediment to improving rural livelihoods in the Eastern Africa region.

Majority of the very poor, who heavily depend on natural resources, live on degraded lands. Land degradation, thus, poses a challenge to efforts to eradicate extreme poverty and enhance food security.

This paper identifies land degradation patterns and causes. It also analyzes the determinants of adoption of SLM in the region.

Conceptual Framework

Causes of land degradation are divided into proximate and underlying, which interact with each other to result in different levels of land degradation (Figure 1). The level of land degradation determines its outcomes on the provision of ecosystem services and the benefits humans derive from those services. Actors can then take action to control the causes, levels, or effects of land degradation.

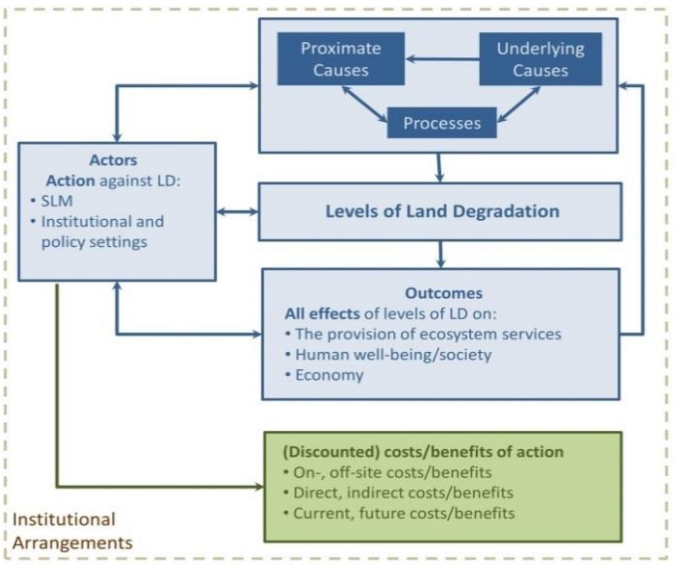

Figure 1. Conceptual Framework
Source: Nkonya et al., 2011.

Results and Discussions

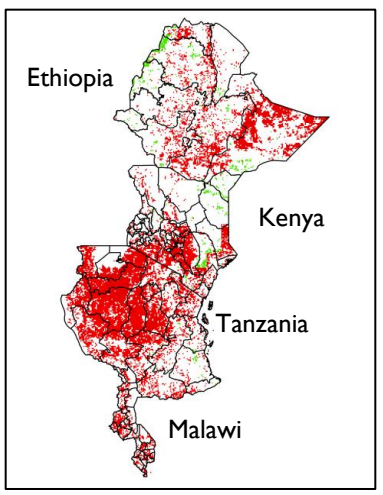

Figure 2. Biomass productivity decline in Eastern Africa over 1982-2006
Source: Le, Nkonya and Mirzabaev., 2014.

- ✓ *Results show that land degradation covers about 51%, 41%, 23% and 22% of the terrestrial areas in Tanzania, Malawi, Ethiopia and Kenya, respectively.*
- ✓ *Land degradation 'hotspots' in the region are: northern Ethiopia, western and central Kenya, southern Tanzania and northern Malawi*

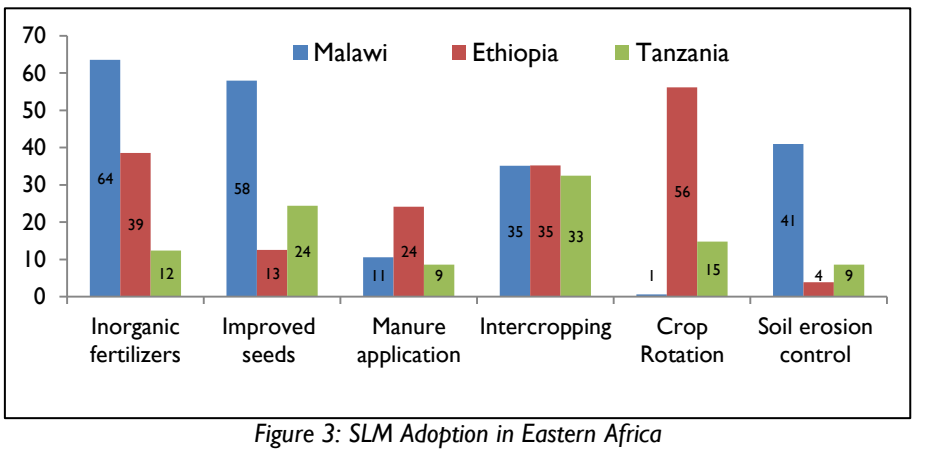

Figure 3: SLM Adoption in Eastern Africa
Source: Authors' compilation.

Drivers of SLM Adoption

Empirical Strategy

The reduced form of the Logit regression model used is given by:

$$SLM = \beta_0 + \beta_1 \boldsymbol{x_1} + \beta_2 \boldsymbol{x_2} + \beta_3 \boldsymbol{x_3} + \beta_4 \boldsymbol{x_4} + \beta_5 \boldsymbol{z_i} + \boldsymbol{\varepsilon_i}$$

where; $\boldsymbol{x_1}$ = vector of biophysical factors; $\boldsymbol{x_2}$= institutional factors; $\boldsymbol{x_3}$= farm- level factors; $\boldsymbol{x_4}$= household factors; $\boldsymbol{z_i}$ = regional factors; and $\boldsymbol{\varepsilon_i}$= error term.

Variables	Ethiopia N= 14170	Malawi N= 18162	Tanzania N= 5614	All N= 37946
Temp	0.134***	0.185***	-0.008	0.066***
Temp sq.	-0.000***	-0.000***	0.000	-0.000***
Rainfall	0.005***	0.000	-0.003**	0.000
Rainfall sq.	0.000***	0.000	0.000	0.000
Temp#Rainf.	0.000	0.000	0.000	0.000***
Elevation	0.000	0.002***	0.001**	0.001***
Warm humid	-0.648***	0.468***	0.301**	0.443***
Cool arid	-0.094***	0.330***	0.004**	0.015*
Cool humid	-0.663***	0.044	0.349	0.012
Age	0.027***	-0.001	-0.013	0.003**
Age sq.	-0.000***	0.000	0.000	-0.000*
Sex	0.189***	0.037	-0.133*	0.084
Edu	0.025**	0.038**	0.001	0.112***
Family-size	0.036***	0.062***	-0.033***	0.035***
Plot slope	0.083**	0.626***	0.283***	0.212***
Title-deed	-0.063	0.163***	0.375***	0.496***
Plot size	0.008	0.389***	0.003	-0.002
Extension	0.039***	0.607***	-0.040	0.602***
Market dist.	-0.014***	-0.019***	-0.021***	-0.010***
Credit access	0.160**	0.042	-0.128	0.220***
Asset value	0.000	0.000	0.000***	0.001***
Ethiopia	-	-	-	0.056***
Tanzania	-	-	-	-0.061***

Source: Authors' compilation.

Conclusions

- ✓ Adoption of SLM practices is increasing: Fertilizer (47%), Seeds (36%), Intercrop (35%), Crop rotation (24%)
- ✓ Drivers facilitating SLM adoption include: education, secure land tenure, access to extension, credit, household assets
- ✓ Constraints to SLM adoption include: inaccessible markets
- ✓ SLM adoption is agro-ecological and regional (country) specific

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