

**ESSAYS IN RURAL ENERGY, FOREST DEPENDENCY AND
COVARIATES OF FUEL SAVING TECHNOLOGIES IN
ETHIOPIA**

By

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Declaration

I declare that this thesis I hereby submit for the degree of Ph.D. in Economics at the University of Pretoria is entirely my own work and has not been submitted anywhere else for the award of a degree or otherwise.

Signed *Abebe Damte Beyene* 

Name: Abebe Damte Beyene

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Promoter: Professor Steven F Koch

Department: Economics

Degree: PhD

This thesis contains empirical findings on rural energy, forest resource use and fuel saving technologies in Ethiopia. Using a household survey data conducted in different parts of the country, efforts were made to contribute to the limited empirical evidences in Africa in general and Ethiopia in particular. The thesis has four empirical chapters and the first and the last chapters of the thesis are the introduction and summary, respectively. The main findings and policy implications are highlighted below.

The second chapter examines the coping mechanisms of rural households to fuel wood scarcity. Using randomly selected households, the results of the empirical analysis show that rural households residing in forest degraded areas respond to fuel wood shortages by increasing their labor input to fuel wood collection. The study also finds that there is no evidence for the substitution between fuel wood and dung or fuel wood and crop residues. Supply side strategies alone may not be effective in addressing the problem of forest degradation and biodiversity losses. Any policy on natural resource management in general and rural energy problems in particular should make a distinction between regions of different forest degradation level.

The third chapter examines the relationship between property rights and household demand for fuel wood, as measured by the source from which fuel wood is collected. Results from the discrete choice model indicate that active local-level institutions reduce the dependency on community forests, but, otherwise, increase household dependency on open access forests. However, land tenure security and local level institutions do not increase demand for fuel wood collected from private forests. The results suggest that there is a need to bring more

open access forests under the management of the community and increase the quality of community forestry management in order to realize improvements in forest conservation.

The fourth chapter of this thesis deals with finding empirical evidence on the role of local level institutions and property right regimes on forest dependency using data from a random sample of rural households in Ethiopia. We find that forest dependency is negatively correlated to the wealth status of the household. Our estimation results suggest that local level institutions are not significant factors in determining use of non wood forest products unlike major forest products such as timber or woody materials in general. We also find that there is a need to expand the current practice of participatory forest management to other open access forest areas. We conclude that generalization on the forest-poverty link depends on the type of forest management and the specific characteristics that prevail in the area.

The last chapter of the thesis deals with finding empirical evidence on the determinants of adoption of different types of fuel saving technologies in urban Ethiopia. The duration analysis suggests that adoption rates have been increasing over time, that income and wealth are important contributors to adoption, and that substitute technologies tend to hinder adoption of Lakech charcoal stove. However, it was not possible to consider prices or perceptions related to either the technologies or biomass availability in the duration models, and, therefore, further research is needed in order to further inform policy with respect to household technology adoption decisions.

Lead Promoter: Professor Steven F Koch

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External examiners:-----

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