

# Use of on-farm tree residues for cleaner cooking and lifting gendered energy burdens in rural Kenya

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## Introduction

Firewood is used to cook and heat space by 9 out of every 10 households in rural Kenya. Less available downed wood at the forest edges means women are forced to walk into the interior to get firewood which is risky, tiring, time consuming and a huge opportunity cost. Sourcing cooking fuel from on-farm tree residues integrated with use of efficient cookstoves lifts women's burden and reduce health risks associated with smoke in the kitchen.



Trees grown on-farm



Prunings from trees on-farm



Sourcing firewood from Kereita natural forest, Kiambu

## Method

- Eighty households at Kereita, Kiambu and Kibugu, Embu counties were interviewed
- Distance travelled to collect firewood, weight of firewood loads and time spent were measured
- One hundred and fifty households at Embu, Kwale and Siaya counties were trained and issued with a gasifier cookstove
- Fuel use, biochar production and pollutant concentrations were measured in 75 households



Top Lit Up-Draft (TLUD) gasifier, produced in Kenya



A women chopping wood for use in the gasifier



Char produced from cookstove for use in soil amendment or as fuel

## Results and discussions

- Firewood is the main fuel used in combination (stacking) with other sources of cooking energy sources
- A round trip of firewood collection from natural forest is 6.3km at Kereita and 8.4km at Kibugu
- Firewood collection is an additional task to working in farms and domestic chores.
- Five percent and 40% of the households at Kereita and Kibugu respectively are self sufficient in firewood supply in form of pruning's from trees on farms and a source of income for some.
- Households could reduce fuel use by 28-39% and indoor concentration of carbon monoxide (CO) and fine particulate matter (PM<sub>2.5</sub>) by 40% and 71% respectively by shifting to use of gasifier

### Take home message

- Firewood collection is hard work especially for elderly and sick women who have no one to help them.
- Women feel a certain pride in the capacity to provide for the household and prefer to spend their time sourcing firewood from natural forest as opposed to spending their scarce income paying for it.
- Sourcing firewood on-farm saves time, reduces women's drudgery, provides income and allows firewood to dry well.
- Combining use of more efficient stoves and firewood from trees in farms improves human well-being and the environment

### TLUD-Gasifier



### Three-stone open fire



## Recommendations

- Awareness raising on the multiple benefits of agroforestry and cleaner biomass cooking systems.
- Promotion of cooking systems that co-produce heat and biochar for their multiple benefits
- Involvement of development practitioners and policy makers towards sustainable and cleaner biomass cooking systems.

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