

Firewood from tree prunings on farm and biochar-producing cooking systems



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Why firewood and improved cooking systems?

Benefits

- It is treasured by communities, 9 of 10 households in rural sub-Saharan Africa use firewood for cooking and heating (IEA, 2006).
- Scarcity affects food and nutrition security



Health risks

- Collecting firewood from forest is life threatening, tiresome, repetitive, a waste of women's potential, hugely non monetary
- Cooking with firewood on open fire produces over 100 times higher fine particulate matter (PM_{2.5}) than charcoal (Njenga et al., 2017).



Modernizing firewood cooking systems

(a) Prunings from trees on farm

In Embu, Kenya it's an exclusive source of firewood for 40% (Njenga et al., 2017).



Drying firewood

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(b) Biochar-producing cooking



- Saves 40% fuel Vs 3 stone open fire
- Yield 20% charcoal/biochar

- Reduce CO, PM_{2.5} by 40% and 90% Vs 3 stone open fire



Biochar-carbon sequestration



Lessons, impacts and replicability

Combining sourcing firewood from multipurpose trees on farms and use of efficient cooking systems will have more impact.

For example, in Tanzania, on-farm wood supply ranged from 0.5-8 t/ha. Relative to three stone open fire, households using improved cook stove consumed 67% less firewood, saved 50% of fuelwood collection time and reduced gas emissions (PM_{10}) by 60% (Sererya et. al., 2017).

This approach is replicable in a wide range of landscape among small-scale farmers.

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