Biomass-related fuels as clean cooking solutions

ECO-CHARCOAL PRODUCTION IN KASIGAU PROJECT AREA

THE CHALLENGE OF TRADITIONAL CHARCOALING

Key Data Insights [1]

Households cut ~76 trees/year, leading to bare land

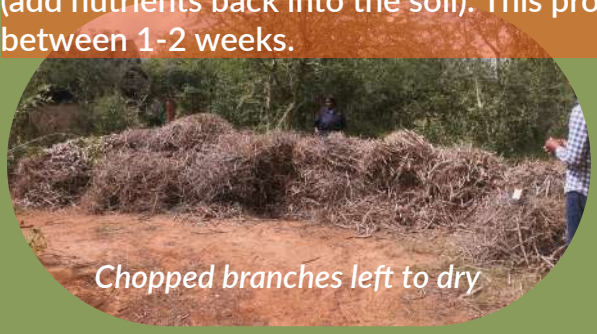
95% report seeing fewer trees; Acacia and Grewia species threatened

96% report reduced rainfall and low regeneration rates

Eco-Charcoal Production Process

1. Harvesting

Finger-sized stems are pruned from shrubs instead of felling trees. There is a method to the pruning-: Done at an angle (45 degrees) and cutting starts from outside moving inwards of the shrub growth. The prunings are collected at central points and further chopped into fingerlings. They are then allowed to dry and for the leaves to decompose (add nutrients back into the soil). This process takes between 1-2 weeks.



Chopped branches left to dry

2. Carbonisation

After drying, the wood is weighed to know the dry weight. Carbonization only happens when the moisture content drops to less than 20%. Drum kilns with 25% conversion efficiency are used.

Dry wood is loaded into the kiln in intervals and closed with airtight lid after it is full. It's left to burn overnight.

Moisture meter

3. Conversion to briquettes

Charcoal harvested from the drum is crushed into charcoal powder/dust. This powder is mixed with cassava flour binder and the resulting sludge is pressed into light-weight briquettes, which take 2 days to dry before they are boxed for sale

Crushing machine

Mixing of char dust with cassava flour sludge

Briquette pressing

[1]*Data From Fieldwork Data Collected as Part of Master's Thesis Research on Sustainable Charcoal Production for Land Degradation*

Benefits of Eco-charcoal

- *Made using sustainable methods hence helps in environmental conservation; encourages regeneration of trees*
- *Burns hotter with less smoke; saves time and effort.*
- *Easier to light up and burns longer compared to traditional charcoal therefore uses less charcoal per cooking cycle*
- *It is means of livelihood especially since former charcoal burners are employed within the facility*
- *Affordability: competitive price point relative to traditional charcoal.*
- *Easier storage and handling since it is packaged in a compact and tidy form*

Recommendations for Adoption

Scale Awareness & Training Programs

This could be in form of workshops and demonstrations in MacKinnon Road, targeting especially women and the 26–45 age group who make up a larger % of the producers (58% and 51.9% respectively). This could increase adoption levels even as the country campaigns to transition to cleaner cooking fuels by 2028.

The project could partner with NGOs (such as The Charcoal Project in Kasigau) and local authorities e.g., County Environment Committee (CEC) to train 100 producers annually on eco-charcoal production techniques, addressing the knowledge gap

Improve Infrastructure & Market Access

-Promote production equipment that would replace earth mound kilns (eg drum kilns and DIY briquette pressers) for local charcoal producers who are ready to transition to modern charcoal
-Streamline project's economies of scale to offer competitive pricing with the traditional charcoal and encourage uptake both locally, and eventually into urban markets like Mombasa and Nairobi.

Further R&D can be done on byproducts such as wood vinegar, (which is still in developing stages) to ensure maximum profits

Integrate Eco-Charcoal into Policy and Regulatory Frameworks

Include local charcoal producers in the process of drafting the project's charcoal strategy for holistic stakeholder engagement and positive outcomes.

National and County authorities to streamline licensing and permitting processes to enable eco-charcoal market distribution

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