

Sustainable firewood access and utilization

Achieving cross-sectoral integration in Kenya

OVERVIEW

This brief is intended for stakeholders involved, directly or indirectly, in the production and use of firewood at household, industrial and institutional levels. In addition to providing some background information, this brief identifies critical knowledge gaps in firewood access and use and proposes a multi-sectoral integrated approach to ensure sustainability in the sector. This approach recognizes the role played by each stakeholder in the entire firewood chain. Of particular importance is the role the county governments can play in initiating the adoption of this approach.

Firewood access and use in Kenya

Firewood is the main source of energy for cooking and heating for almost all households in rural areas in Kenya. The firewood is often sourced from farmlands, public and private plantations and indigenous forests as either live or deadwood. The 2005/2006 Kenya Integrated Household Budget Survey (Basic Report) estimated that 68.3% of all households in the country depend on firewood as the main source of cooking fuel [1]. Rural families' preference for both space heating and cooking from the same source and the high cost and irregular supply of alternative fuel sources such as charcoal, electricity, liquid petroleum gas (LPG) and kerosene often makes firewood the only viable source of energy. It is expected that biomass will continue to be the preferred domestic energy source in the future, as households do not climb up the energy ladder with increasing income; instead a phenomenon known as "fuel stacking" is observed. This is where households use various fuels to meet their daily energy needs e.g. kerosene+charcoal; charcoal+LPG; kerosene+LPG+charcoal; rather than switching completely to using a single fuel.

Apart from households, there are many bulk users of firewood including learning institutions, prisons, industries such as tobacco, tea curing and fish smoking, and small and medium enterprises such as restaurants and camping sites. In the tea industry, over 70% of small-scale factories have boilers that can use both furnace oil and firewood in curing tea. Most of them use wood-fired steam boilers to generate heat in order to reduce the cost of tea production [2]. Meanwhile, it is estimated that a student in secondary school consumes an average of 0.524kg daily of firewood irrespective of the combustion device used for cooking, school type and number or types of meals cooked (Nyambane forthcoming). The per capita consumption would change when parameters that influence firewood consumption are considered.

These examples show that it is time to acknowledge the important role that firewood plays in meeting energy needs in Kenya, and not simply view it in terms of negative environmental impacts. Indeed, shifting from firewood to charcoal or kerosene does not automatically lead to positive impacts as historically presumed. Charcoal production has a worse impact on the environment compared to firewood collection as trees and shrubs are cut down in the former while in the latter, prunings, deadwoods and forest residues

are the main sources. Kerosene, on the other hand, is unaffordable for the majority of poor households and fails to provide the highly appreciated space heating that allows families to sit around the fire and socialize, especially in the evenings.

Concerted effort across sectors is required to understand and regulate the sourcing and use of firewood in a way that minimizes its negative impacts on environment and health. Firewood is becoming increasingly commercialized, thereby creating an opportunity for regulating this sector in ways that have not been available previously.

Key challenges

Several challenges hinder sustainable access and utilization of firewood, specifically, the imbalance between supply and demand, gender inequality and knowledge gaps.

Imbalance between supply and demand

In rural Kenya, firewood is generally sourced from farmlands, private/public plantations or indigenous forests where tree by-products such as pruned branches from forest plantations or fallen pieces of wood are collected. Some firewood is also gathered from 'gazetted' forests. This is strictly regulated by the Kenya Forest Service, through restrictions on the number of human loads that can be collected per day and on implements that can be used in wood-cutting (e.g. machetes, not axes). However, enforcement of these regulations is often weak, leading to illegal harvesting of young trees, thus hindering natural regeneration of trees and threatening Kenya's already low forest cover of 5.9%.

The demand for commercial firewood from private plantations and individual farms currently exceeds supply, leading to firewood collection in vulnerable ecosystems such as dryland areas where vegetation can only be naturally regenerated. The deficit between biomass supply and demand as a whole was 57.2% in 2002 and projected to increase to 63.4% by 2015 [3].

Gender inequality

The challenging and tiring task of collecting firewood for household use is often the responsibility of women and children. This involves spending at least one day each week travelling long distances to the forest hence limited time to be involved in other more productive activities, and carrying heavy loads of firewood on their backs or heads, thus risking spinal, head and leg injuries (Figure 1). In addition, they are at risk of being attacked by wild animals and human beings. Young children involved in firewood collection often miss education opportunities, a situation that disproportionately affects girls.

Besides the negative impacts of firewood collection, the household air pollution generated by the use of firewood in inefficient cookstoves – e.g. the traditional three-stone fire – in poorly ventilated dwellings mainly affects women and children who spend most of their time in the kitchen. These devices produce products of incomplete combustion that are associated with respiratory diseases. According to the latest Global Burden of Disease estimates, use of biomass fuels is now the second leading risk factor for ill health in developing countries [4].



Figure 1: Children and women carrying firewood on their heads and backs. Photos by: Daisy Ouya and Mary Njenga from left respectively.

Knowledge gaps

Firewood collection and use is a traditional activity that has received relatively limited attention from researchers, development practitioners, development partners (donors) and policy makers. This has led to a general lack of knowledge on how to move to more sustainable practices associated with the use of firewood. Important knowledge and knowledge-generating activities for different actors include:

- **Farmers:** Knowledge on farm planning such as where, how and which species of trees to plant on their farms and how to harvest firewood from these trees [5].
- **Researchers and project implementers:** Mapping of woodfuel multipurpose tree species for different ecological zones and involvement of end users in development of technologies aimed at energy use efficiency such as improved firewood cookstoves.
- **Policy makers:** Scalable data on good practices as well as funding and enforcement of existing bioenergy policies and regulations.

The need for cross-sectoral approach in firewood management in Kenya

The lack of cross-sectoral integrated approaches to firewood management results in a number of negative impacts:

- Development of technologies that do not suit the needs of users.
- Poor continuity in initiatives.
- Duplication of efforts resulting in huge amounts of resources being spent on similar initiatives.
- Limited sharing of knowledge hence low cross-learning from experiences from different stakeholders.

Integrated approaches to managing firewood access and use will facilitate the development and adoption of appropriate technologies for wood production, e.g. agroforestry as illustrated in Box 1.

Box 1: The role of agroforestry in ensuring access to firewood

Long before the launch of the Kibirigwi Irrigation Scheme in Kirinyaga County, farmlands were bare with no trees and hence many of the households faced a challenge in sourcing cooking fuel. Women and girls were forced to travel long distances to the forests which were usually infested with wild animals to fetch firewood. They also risked personal attack. I was one of the girls, and we went to the forest in groups and spent the whole day fetching the precious commodity. Crop residues were another source of cooking fuel though of very low quality – they burned for a short period of time and as such larger quantities were required to cook a meal. The Kibirigwi Irrigation Scheme came up with an agroforestry initiative where farmers incorporated trees in their farms. I participated in the exercise and thanks to the project, firewood is now easily accessible within the farms and the entire scheme looks beautiful with lots of tree in the farms. Farmers use the tree prunings for firewood while mature trees are harvested for timber. The success of the agroforestry initiative was due to the collaboration between local farmers who were also involved in the management of the scheme, the forestry department who provided tree seedlings and the Ministry of Agriculture which created awareness among farmers on the benefits of agroforestry.

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Having access to firewood on farm saves time and reduces the burden for women. This results in increased productivity in other income generating activities, such as agriculture. Planting trees on farm will also reduce pressure on the forests, hence allowing provisioning, regulating and supporting ecosystem services provided by trees to be equitably and sustainably enjoyed. Efficient enabling policy regulations will allow sustainable harvesting of firewood from forests and farms. A multi-sectoral integrated approach will ensure the involvement of all the stakeholders in attaining sustainability in the firewood sector. Other benefits of sectoral integration include efficient marketing strategies that generate more income for both men and women. Development of efficient cook stoves will not only ensure saving of wood, but will also reduce health risks associated with household indoor air pollution.

Recommendations

First, the contribution of firewood to welfare and economic activities in the country is enormous and it should be directly addressed under the energy policy. Second, in Kenya, the county governments play a

vital role as the key initiators in the realization of a sustainable firewood production and use system, through a multi-sectoral integrated approach. These recommendations can be achieved, for example, through:

- Development of plantations for woodfuel, e.g. by Kenya Forest Services
- Adoption of on-farm tree planting (agroforestry) with proper management and appropriate choice of tree species
- Efficient management of forests and drylands (KFS)
- Development and adoption of efficient firewood cookstoves (cookstove manufacturers and firewood users)
- Development and adoption of innovative technologies for supply of cheaper and cleaner cooking fuel such as gasification and briquetting of biomass (cookstove manufacturers and biomass users)
- Enabling institutional and legal framework on woodfuel (policy makers)
- Awareness creation to ensure each player recognizes the value of a particular practice (all stakeholders in the firewood chain)

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