

Livelihoods in the urban biomass sector – realities and threats*

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Whether it be wood, charcoal or simply branches, leaves and twigs, traditional biomass fuel remains the most important source of household energy for more than two billion people in today's world.

Associated with the mass consumption of these biomass resources are concerns about environment and health, and much research has been carried out to identify and measure impacts such as deforestation from unsustainable wood and charcoal production, and smoke-related illnesses that can occur when biomass fuel is used in poorly ventilated kitchens.

In the last few decades attempts have been made to reduce biomass consumption through a range of interventions that create the conditions for 'fuel substitution' to occur.

If measures are effective in reducing biomass consumption, what might this mean for the livelihoods of the many people who serve the biomass trade?

This question formed the basis of a recently completed DFID KaR project, carried out by Energy for Sustainable Development Ltd (ESD) and a team of experts from Ethiopia, Kenya and Uganda. All three countries have experienced various fuel substitution measures in recent years, such as:

- **Addis Ababa:** Subsidies on electricity and the introduction of electric Mitad stoves (used for baking the Ethiopian staple bread injera) led to a massive increase in ownership of these stoves – from 13% in 1985 to over 70% by 1995.
- **Nairobi:** Liberalisation of the petroleum sector in 1994 brought favourable conditions for the supply and marketing of LPG, though the price currently limits its use to upper and middle income classes. Kerosene has been

What is 'fuel substitution'?

The term 'fuel substitution' encompasses a number of measures, including:

- **more efficient use of biomass** (i.e. by means of efficient end-use appliances and technologies such as improved stoves)
- **use of modern fuels or energy sources** (e.g. kerosene, LPG, electricity, solar PV, etc)

In both cases, this could mean either:

- **fuel switching** – termination of the use of one type of fuel and uptake of another source of energy in its place
- **inter-fuel substitution:** introduction of new energy sources that do not replace, but supplement, existing fuel types.

subsidized, and more than 94% of Kenya's population currently use kerosene.

- **Kampala:** Electricity was subsidized during the 1960s to reach the poorest, but tariffs have been rising since 1993, especially since privatization of the Uganda Electricity Board in 1999. Interventions to promote LPG and kerosene have so far not been widely implemented.

One of the first objectives of this research was to characterize the biomass sector in these three cities. If fuel substitution measures have the potential to threaten livelihoods, who would be affected and on what scale?

Through a series of tallies held at major entry points to each city, and at key vending locations, the team identified a diverse range of actors engaged in transportation and sales of both wood and charcoal, and, in the case of Addis Ababa, branches, leaves and twigs. The full range of actors and some key social characteristics are summarised in Table 1.

This broad spectrum of activities corresponds to an equally wide range of livelihood circumstances for fuel suppliers. The circumstances for each group were examined in terms of access to a number of different assets,

as identified in the Sustainable Livelihoods approach.

In all three countries, some common trends were identified:

- The difference in income levels of motorized versus non-motorized transporters and wholesale versus retail vendors is significant.
- The correlation between gender and type of activity means that it

Case Study 1 – A 'Branches, leaves and twigs' (BLT) vendor in Addis

Mrs B, a 30-year-old widow with two children, has seen the price of BLT increase, having an impact on her ability to secure sales, and she states that her daily income has decreased almost by half in the last four years. Her only reason for remaining in the business is the lack of an alternative. One of the main problems expressed by Mrs B is the lack of a secure vending place. The main space she now occupies is on a roadside, although she vends in and around a designated market place. As a result, she is exposed to occasional harassment.

Her accommodation, an informally sub-let single room in a family house, was affordable to begin with, but has been gradually increasing at the same time that her income has been decreasing. With two children to care for, and no other income to rely on, her situation illustrates extreme vulnerability in this sector.

Table 1 Social characterisation of biomass fuel suppliers

Fuel transporters	Vendors
<p>Mode: Lorries, trucks</p> <p>Countries: All In all three countries, it is only men that transport fuel by motorized means. As local plantations are depleted, and fuel supplies become more distant from city centres, this mode of transport has been increasing.</p> <p>Mode: Human carriers</p> <p>Countries: Ethiopia, Kenya In Ethiopia, 70% of the human carrier sample were women. In Kenya, only a small proportion of fuel transportation is undertaken manually. When this does occur, it is usually by women.</p> <p>Mode: Donkeys</p> <p>Countries: Ethiopia Donkeys are the second most common mode of non-motorized transportation in Addis Ababa. While only 25% of female carriers have access to donkeys, 82% of men are able to use donkeys for transporting fuel.</p> <p>Mode: Bicycles</p> <p>Countries: Kenya, Uganda In Kampala, bicycle transportation is usually by self-producers bringing charcoal into the city. Bicycles are also used to transport fuel from depots to customers. These are predominantly male activities.</p> <p>Mode: Wheelbarrows and carts</p> <p>Countries: Kenya, Uganda Wheelbarrows and carts are mainly used to transport fuel across town, linking vendors with domestic or commercial consumers. Like bicycles, it is mainly men that transport fuel in this way.</p>	<p>Type: Wholesale, depots</p> <p>Countries: All In Ethiopia and Kenya, it is mainly men and very few women that own and work in wood or charcoal depots. In Uganda, women as well as men are engaged in wholesale of charcoal, but this is considered a 'dirty' business.</p> <p>Type: Shops/Kiosks</p> <p>Countries: Ethiopia, Uganda Fuel is usually sold in these outlets alongside other goods. These are usually owned by men in Ethiopia, whilst in Uganda, charcoal vending activities are dominated by women.</p> <p>Type: Market stalls (Figure 1)</p> <p>Countries: All In Ethiopia, it is mainly women who operate in markets, whilst in Kenya it is mainly men that are involved in all types of fuel vending. In Uganda, markets are decreasing in importance, as neighbourhood-based sales increase.</p> <p>Type: Neighbourhood vendors</p> <p>Countries: All These vendors sell very small quantities of fuel to regular customers, and keep a limited stock. As with all charcoal vending activities in Uganda, this category is dominated by women. The same is true in Ethiopia.</p> <p>Type: Roadside vendors</p> <p>Countries: All In Uganda, it is mainly women selling firewood. Roadside vendors are a relatively recent phenomenon. In Ethiopia, these are also mainly women who have self-collected the fuel they sell.</p>



Figure 1 A fuel market in Addis Ababa

or access shared resources such as donkeys or other vehicles.

Those with fewest assets are the most vulnerable position within this sector. However, in order to really judge what this means for the population of fuel suppliers as a whole, it is necessary to consider the proportions of fuel suppliers engaged in each type of activity.

Results of the tallies carried out at the beginning of the research are shown in Table 2. They indicate that the most secure and well-paid activities, i.e. motorized transportation and wholesale vending, are in short supply, with a high proportion of suppliers employed in non-motorized transportation and the retail sector. If broken down further, these statistics show a clear concentration of women in the lowest-paid, most arduous and least secure jobs.

In this study, clear evidence of livelihood loss as a direct result of fuel substitution measures has been very difficult to pinpoint. Two possible reasons for this are:

- Fuel substitution policies are yet to be effective in reducing overall quantities of biomass fuel consumed in urban areas. This may be due to increasing urban populations or the fact that greater efficiency does not reduce fuel use but means that the same amount of fuel is being used, but for additional purposes, such as boiling water.
- Individuals do not relate changes in their livelihood circumstances

is only men that are able to earn a decent wage from the fuel supply business.

- Physical assets were identified as the most important asset for all suppliers. Examples include vehicles, donkeys, a secure vending location and storage space.
- Women are concentrated in activities in which access to these assets is extremely limited, for example manual transportation of fuel, market sales and roadside vending.
- While women have strong social assets in terms of networking with

other women, and membership of community associations, it is men who are most able to use their social assets to enhance their livelihoods. Greater access to social assets enables men to obtain credit, avoid harassment with authorities

Table 2 Breakdown of fuel supplier tally by activity

City	Sample size	Motorized	Transporters		Vendors
			Non-motorized	Wholesalers	Retailers
Addis Ababa	9537	8%	50%	7%	35%
Kampala	7487	20%	10%	10%	59%
Nairobi TBC	24%	34%	42%		

Table 3 Recommendations for action

Assets	Indicators	Livelihood improvements	Recommendations
Financial	<ul style="list-style-type: none"> ● Ability to save. ● Access to credit. ● Increased income. 	<ul style="list-style-type: none"> ● Savings can support households in times of low fuel supply and demand. ● Credit may allow purchase of labour-saving aids, e.g. vehicles and can improve sustainability of businesses. 	<ul style="list-style-type: none"> ● Formalization of traditional fuel supply business is likely to improve the conditions for credit and other business activities. However, we should also recognize that the informality of the sector has its own benefits, such as ease of entry, a certain degree of freedom and autonomy, invisibility and escape from government control.
Physical	<ul style="list-style-type: none"> ● Storage space. ● Designated selling areas. ● Adequate and sheltered premises. 	<ul style="list-style-type: none"> ● Less frequent journeys, security. ● Reduced scope for harassment. ● Reduced risk of damage to supplies from rain, etc. 	<ul style="list-style-type: none"> ● The extent to which formalization of this sector should occur is, therefore, an issue for further investigation, and this should include an analysis of the likely impacts on the most vulnerable fuel suppliers.*
Social	<ul style="list-style-type: none"> ● Business networks. ● Community groups. ● Supplier organizations. 	<ul style="list-style-type: none"> ● Collective bargaining power to influence prices and quality of wood and charcoal, especially for women. ● Improved security (collection, transportation in groups); better access to shared resources (e.g. vehicles), especially for women. 	<ul style="list-style-type: none"> ● Recognise the valuable contribution of fuel suppliers, and especially women, in supplying an important and affordable source of fuel for institutional, commercial and domestic consumers.
Human	<ul style="list-style-type: none"> ● Education. ● Training. 	<ul style="list-style-type: none"> ● Improvement of opportunities to pursue alternatives in times of low supply and demand, or in case of displacement as a result of fuel substitution. 	<ul style="list-style-type: none"> ● Ensure that, where significant losses of employment are likely, sustainable and gender-neutral re-employment or training programmes are pursued.
Natural	<ul style="list-style-type: none"> ● Sustainable production. 	<ul style="list-style-type: none"> ● Security of supply; ● reduced scope for harassment; ● improvements to status of sector; ● reduction in necessity for motorized transportation. 	<ul style="list-style-type: none"> ● Develop existing and new policies and strategies for the rational and efficient production, transportation and marketing of biomass fuels and household energy efficiency (e.g., improved stoves).

*DFID KaR 'Livelihood Substitution' Contract No. R8175 is currently researching ways to integrate the interests and needs of the poor into infrastructure and services development, which includes sector formalization.

with interventions at a macro level – especially since they are often unaware of the policies that have been introduced.

Nevertheless, individual case studies indicate that the lack of alternative livelihood options for the vast majority of fuel suppliers makes them extremely vulnerable to changes in the market for traditional fuel. Fuel substitution measures that do not consider this group are likely to have serious impacts on them.

Perhaps more importantly, however, this research has shown that, right now, the greatest threat to livelihoods of fuel suppliers relates to the environment in which these actors operate. The conditions of the fuel sector itself have a direct impact on those who are trying to make a living in this business.

- **Biomass regulatory measures**, such as charcoal bans in Kenya and Ethiopia have created conditions in which corruption and institutional harassment flourish, thus increasing the vulnerability of suppliers, and particularly harming those who cannot afford to pay bribes and are more visible to the authorities, e.g. roadside vendors.
- **Lack of sustainable forestry policies** mean that, as local sources of fuel are depleted, it becomes increasingly necessary to use motorized transport to bring supplies to the capital. As a male-dominated activity, this pushes women out of the sector.
- **Social conventions** mean that attitudes towards the traditional fuel sector are generally negative, partly due to its illegal nature, and

also as a result of the nature of the work itself, since charcoal is a naturally dirty commodity. The results indicate that women tend to have lower negotiating power, are excluded from the motorized transport sector, and are very rarely present in the wholesale supply of fuel.

Social and institutional factors take time to change. However, by improving people's access to assets, their vulnerability can be reduced, placing them in a better position to positively influence the structures and processes surrounding them.

In this regard, the team has identified a number of measures that can improve both the existing circumstances of suppliers and better equip them to deal with any future impacts that may result from successful fuel substitution policies (Table 3).