Energy poverty and cooking energy requirements: The forgotten issue in South African energy policy?

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Abstract
Cooking energy is a necessary input for satisfying the basic human need of survival. Much has been written about poverty, energy, development, environment and gender, but unfortunately, recent policies adopted by the South African government have completely failed to adequately address the issue. The focus of energy and most notably renewable energy policy has shifted form the previous approach of increasing access to energy sources for low-income households to addressing climate change issues. Pro-poor policies have suffered and important fuel such as wood fuel is not addressed. It is argued that without adequately addressing thermal requirements of low-income households, energy poverty cannot be addressed. The aim of the paper is firstly, to contextualise cooking and cooking energy within a framework of household energy, poverty, multiple fuel use and gender issues and secondly, to provide an overview of the cost and externalities associated with household cooking. Lastly, the paper proposes interventions to address cooking energy in a sustainable manner in South Africa.
Keywords: household energy, gender, cooking, cooking energy, multiple fuel use

Introduction

As with a number of things where the whole is more than the sum of its parts, cooking is more than the combination of food in an appliance using energy. Cooking is linked to cultural, religious and societal beliefs, it is the lubricant of family and community life and it is associated with well-being, mothering, safety and nourishment. Of course it also provides cooked food necessary for human survival. Lack of food can seriously jeopardise human health and well being, while lack of fuel for cooking energy can also be threatening to human survival. Annecke (1998) notes '…being without wood for two days during the rain meant two days without cooking, which in turn, means being without food. There is no bread in these households, no fast foods or cookies or anything other than salt and mealie meal and tea leaves and sugar'.

Energy and gender

A short discussion of energy and gender is necessary since gender roles affect cooking and cooking energy profoundly. Sengendo (2004) notes and summarises that gender is a two dimensional concept: first, within the development paradigm, gender is an analytical variable used to analyse policies, programmes or projects and how these impact differently on men and women. Secondly, gender describes the social relations between men and women and the way this is socially constructed by society.

Gender roles refer to the different roles assigned to men and women by the society in which they live. Along with these roles come certain rights and obligations, and the term 'gender contract' is used to describe how the relationship between men and women is shaped and enforced. Closely linked to this is 'gender relations', which refers to the underlying balance of power between men and women in society, from which gender roles and gender contracts are derived. Hooper-Box et al (1997) state that gender relations impact on decision making in terms of fuel and appliance use, acquisition and expenditure. For example, men and women spend money differently on fuel and appliances. Men spend more money on batteries. Annecke (1994) and James (1993) found that households that have high battery expenditure have men and sons who listen to taped music. Makan (1996) concluded that 'men tend to buy larger, costlier appliances, whereas women control money for smaller routine items. What the spouses buy, reflect power and control over resources'.

- Gender theory recognises that in most societies, women and men are involved in various roles. The nature and extent of their involvement in

each activity reflects the gender division of labour. Gender roles are analysed in terms of the triple role which divides tasks of men and women and girls and boys into three main types: reproductive, productive and community tasks. Gender roles are not universal (in some societies men can do work which in other societies is considered women's work and vice versa), and gender roles may be negotiated in terms of type and volume shared (we take turns to do the dishes and I will do the shopping if you will take care of the maintenance of the car). However, women are said to carry a triple responsibility for well being

- Reproductive: This refers to all the tasks undertaken to reproduce the labour force (bringing up the next generation) and includes child bearing and rearing, feeding the family, caring for the sick and teaching acceptable behaviour;
- Productive: This refers to work done for payment in cash or kind, and it includes the production of goods and services for subsistence or market purposes;
- Community tasks: This refers to tasks not done for individual family gain but for the well-being of the community or society: charitable work, self-help, communal construction of village facilities, serving on village committees, involvement in religious activities and supporting friends who need help.

It is primarily women who perform reproductive tasks and home–based productive and community tasks, while men are mainly involved in productive tasks outside the home and community tasks that entail decision making rather than caring functions. Because women perform different tasks to men, they require energy for different things and from different sources. This means that women's priorities in terms of energy and appliances may be different from men's – he may want to buy a new diesel generator for water pumping to irrigate his field while she may desire a refrigerator to keep food from spoiling and keep milk for the baby.

Cooking can be used as a further example. Cooking for the family or the household is considered a reproductive task and therefore a women's task. In a number of societies it is not only frowned upon for men to cook but a specific taboo. To be able to perform her duties, a woman must prepare food for her family – this does not only entail the actual cooking process but also the preparation of the food – pounding, grinding, preparing, cooking and serving. Each step requires energy, mostly human energy in the form of women's labour but also thermal energy to cook the food. The acquisition of energy sources, their management and their use is therefore chiefly a woman's responsibility by virtue of her gender role. Farhar (1998) notes that this is true for women in developed as well as developing societies: 'In the United States, women often write the checks and pay for energy. They make significant decisions relevant to energy, including the purchase of automobiles, houses and major appliances. Because women do most of the laundry, food shopping, refrigeration and cooking, the timing of energy consumption affects utility peak loading. In developing countries, women most often 'produce' energy and are the household energy users.'

A number of studies recognise that the use, purchase and expenditure on appliances is gendered (Annecke 1994, Bank et al. 1996, James 1993, Makan 1995, Makan 1996, Mehlwana and Qase (1996), White et al. 1996). For example, Annecke (1992) found that women regarded paraffin as a 'feminine' fuel since it symbolises and encourages trends and relationships amongst women in the community. Similarly, Hoets (1994) found that women regard their coal stove as the heart of the house, providing warmth and life. Batteries are viewed as a man's energy with women seldom identifying themselves with battery purchases, while paraffin is regarded as a women's fuel because all the 'female related work' is associated with paraffin use (Hooper-Box et al, 1997).

From the above discussion it can be concluded that men and women have different roles and responsibilities in society and due to their different roles, men and women acquire, use and need energy differently. Cooking, one of the main reproductive tasks is often the sole responsibility of women, and therefore, the procurement and management of energy sources required for cooking also falls to women. However, due to relationships of power and control, men can influence and control women's acquisition of fuels and energy sources – women don't often have a complete say over what they would like to use or buy. One of the central arguments of the paper is that because cooking is a women's job and linked to poverty, the subject has never been adequately addressed or interventions and solutions to the problem sought – it is not only in the home where women have less power than men but also in the political and policy arena.

Household cooking

Why are households cooking?

What may seem like a silly question is an appropriate start to a discussion of household cooking. Households not only cook to provide nourishment in the form of food to their families, but also to nourish their families in a broader sense (see, for example, Hoets (1992) and Annecke (1994)). It is further a sobering thought that the majority of households do not necessarily eat what they would like to – Market Support Associates (2003) found that factors that drive the choice of food is 'what I

can afford' and 'what is available', rated as twice as important as eating 'what I want'. Closely linked to this is the availability of fuel in the household and Ross (1993) describes how available food influences the choice of cooking fuel – one respondent reacted 'Gas is nonsense! You can't cook samp on gas, you must cook it outside'.

Because the respondent mainly had samp available as food, her fuel log indicated that she mainly used wood and paraffin during the week. Available food therefore influenced fuel use but Annecke (1994) also found that the type of fuel available in the household will determine what can be cooked that day. Annecke (1994) also puts forward a theory that African women who are materially disadvantaged and have little opportunity for building self-esteem acquire respect and authority as well as a position of importance through providing a properly cooked meal, especially to men and to a lesser degree, children. She found that the same meal may take double the time to cook (using double the amount of fuel) when women cooked for men than when they cooked for themselves. This would imply that cooking is more than supplying food for eating, but encompasses feelings of self-worth, dignity, success as a woman and a nurturer and being a successful provider.

Cooking and household energy consumption

Sugrue (2005) estimates that the average poor home in South Africa spends 25% of its income on energy compared to a figure of 2% for more affluent homes. The opportunity loss for these poor homes from that expenditure is significant taking consideration the extensive needs of the poor. SEA (2003) corroborates this and reported that poor households in Cape Town spend between 10% and 25% of their income on energy, while wealthy households spend between 3% and 5%. An accurate figure of how much of these poor households spend on cooking energy is difficult to arrive, at but the World Energy Council (1999) states among the poorest families in most developing countries, cooking (and space heating depending on the climate) accounts for between 90 and 100% of energy consumption. The remainder of the energy consumed is for lighting provided either by the cooking fire, kerosene lamps, candles or electric torches (World Energy Council, 1999).

Estimating the percentage of cooking energy as part of the total energy consumption of a household is difficult to determine because of the fact that fuels are used for more on end-use, as well as for different end-uses in one household. This is illustrated in Table 1. Even if estimating the exact percentage of energy consumed by cooking activities in households is difficult, what can also be seen from the table is that thermal energy requirements take up the bulk of energy consumed in a household.

Furthermore, the amount of energy used for cooking depends on many factors such as the type of food cooked, the number of meals cooked, household size, the specific combination of energy source and cooking equipment employed (type of stove, cooking pans), and the way in which cooking devices are used. Cooking of staples and other foods varies greatly both in terms of time and the rate of heat input required. For example, rice is usually boiled or steamed for 20 to 30 minutes, while kidney beans may be boiled for four hours or more. Field measurements of the specific fuel consumption to cook various staple foods found that rice for an average household takes between 12 and 38 MJ/kg to cook, while beans can take up to 225 MJ/kg. These measurements were based on cooking with wood fires.

Table 1: Energy sources and end-uses in Khayelitsha
Source: Hofmeyr et al (1994)

Fuel	*End-use (% respondents)*			
	Cooking	*Lighting*	*Heating water*	*Space heating*
Paraffin	59	39	51	74
LPG	26	12	22	7
Electricity	22	34	27	15

Since diets include food other than staples, another useful indicator is cooking energy consumption per person-meal or per person-day. The World Energy Council (1999) found that daily cooking energy consumption per capita varied from 11.5 to 49 MJ, based on field measurements. Despite a wide range of locations and conditions, the range of consumption is quite small. In households where modern cooking energy sources and equipment are used, and the preparation of partially cooked food is common, specific fuel consumption is found to be in the region of 2 to 3 MJ/capita/day.

Thorne (1993) notes that cooking is an energy service in which there are strong and often highly specific fuel and appliance preferences. However, cooking is also only one of a range of services that are delivered from a stove or a fire. For example, coal and wood stoves have multiple utilities, including cooking, space heating, water heating, light and social focus (Thorne, 1993). This multi-functionality of specifically coal stoves has been described by Hoets and proposed as one of the important reasons why households do not get rid of them in favour of an electric stove. However, Market Support Associates (2003) concludes that 'the key issue for consumers is the cost effective and timeous provision of good meals for the family. Technologies and energy sources are simply a

means to this end and will only be considered if they can fulfil the primary need, regardless of any other potential benefit. Once this threshold is crossed, the choice of energy is a function of what the consumer can afford to use and of what is available at any point in time'. Providing cooked food in the most economical manner remains the most important objective and peripheral issues, although present, will take a back seat to affordability of the fuel.

Fuels used for cooking

As pointed out earlier, households use a variety of fuels for cooking purposes, for example, wood, dung, crop wastes, IP, LPG, coal and electricity. Some desperate households have also been observed to burn plastic bottles, old shoes and plastic sheeting when they have no other alternatives. Mehlwana and Qase (1999) concluded that fuels are chosen for their perceived efficacy in performing specific tasks and at different times of the year, month and day, fuel use patterns are different. This fact necessitates an approach to data collection which can accommodate seasonal and other impacts on household fuel use. Longitudinal studies are therefore urgently required to monitor and measure household fuel use and to provide updated data for policy formulation and decision-making.

A number of health and safety issues relate to cooking – most notably indoor air pollution, the risk of fires and burns and injuries associated with wood collection – neck and back injuries from carrying heavy loads, and the risk of attack and rape when collecting fuel wood. Health and safety issues related to cooking mainly affect women and children since they are most often exposed to smoke and other side effects of cooking with polluting fuels. It should be noted that smoke emissions from cooking fuels could potentially be curbed through the use of improved cooking stoves and devices – it is not the fuel that is dirty and polluting, but the inefficient manner in which the fuel is used that causes the pollution. However, since the availability and affordability of efficient stoves are not yet widespread, the reality is that fuel use, especially in low-income households has negative side-effects.

Cooking energy expenditure

Expenditure on cooking energy is also difficult to calculate because households use a number of fuels for cooking purposes, and some fuels are used for dual purposes such as space heating, water heating and cooking. Based on information from a survey carried out in four different areas in 2004 (PDC, 2004), an attempt was made to separately calculate household cooking, space heating and water heating energy expenditure. It became clear that household expenditure on thermal energy requirements (cooking, space heating and water heating) together made up the bulk of energy expenses.

Given the importance of thermal energy for households, and particularly for women, it is surprising that South African energy policies do not allocate more attention and resources to this topic.

South African energy policy environment

South Africa has one of the most progressive constitutions in the World and an impressive range of policy documents articulating Government's vision for the development of the country. A White Paper on Energy Policy was approved by Cabinet in 1998. Since then, a number of policies have been implemented through Acts promulgated, and Bills currently in preparation. These Acts and Bills include:

- Nuclear Energy Act (1999) No. 46 of 1999;
- National Nuclear Regulatory Act, 1999 (Act No. 47 of 1999);
- Gas Act, 2001 (Act No. 48 of 2001);
- Petroleum Products Amendment Act 2003;
- Petroleum Products Amendment Act 2004;
- Petroleum Pipelines Act 2003
- Petroleum Pipelines Money Act;
- Electricity Supply Industry Regulatory Bill;
- Electricity Supply Industry Restructuring Money Bill;
- Electricity Distribution Industry Restructuring Bill;
- Electricity Distribution Industry Restructuring Money Bill; and
- National Energy Regulator Act, 2004;

The White Paper on Renewable Energy (2004) sets out a target of 10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-elec-

Table 2: Household cooking, space heating and water heating energy expenditure

Area	*Lighting expenditure*	*Cooking expenditure*	*Space heating expenditure*	*Water heating expenditure*	*Total energy expenditure per month*
Benoni	R72.30	R236	R58	R41.25	R407.00
Galeshewe	R195	R164	R206	R64	R629
Gugulethu	R122	R78.5	R419	-	R619.50
Lady Grey	R136	R118	R166	R41	R461

tric technologies such as solar water heating and biofuels. The emphasis in the White Paper is on investment in large-scale renewable energy projects as opposed to utilising renewable energy for increasing access to energy for the poor. Cabinet has also approved the release of a draft National Energy Bill for public comment. The Bill will establish the National Energy Act, 2004 and will come into operation on a date determined by the President by proclamation in the Gazette. The purpose of the Energy Act is to address those energy policies not already implemented through the above Acts and Bills, and the possibility does exist that the South African National Energy Research Institute (SANERI), created in the Central Energy Fund, will adopt a more pro-poor approach.

South Africa's energy policy is, however, not only shaped by internal policies but also by international policies and agreements, for example, the Johannesburg Plan of Implementation (JPOI) which resulted in the setting of sustainable development targets as encompassed in the Millennium Development Goals (MDG's). Despite a range of local policy documents and the acceptance of international objectives as set out in the MDG's, it is argued that the government is only marginally pursuing the implementation of pro-poor energy policies and that inadequate resources are allocated to address energy poverty in the country.

Current government activities to address energy poverty

Most efforts from Government have been focussed on increasing access of low-income households to electricity, but it can be argued that cooking energy and the supply of clean, safe fuels to low-income households for cooking or other thermal energy requirements are inadequately addressed. Examples of direct and indirect Government projects addressing electricity are:

- Increasing access to electricity through ongoing electrification
- The supply of free basic electricity
- Introduction of energy efficient lighting
- Introduction of energy efficient building codes
- Introducing energy efficient appliance labelling
- Demand side management activities

Examples of Government projects addressing thermal energy (some to a higher degree than others) are:

- Implementing Integrated energy Centres to increase access to commercial fuels
- Investigation of the introduction of gel fuel to replace IP
- Support for the solar cooker programme
- Investigating increased access to LPG

From the above examples, it can be seen that a lot more effort has been invested in increasing access to non-thermal energy sources, for example, electricity. However, the implementation of measures to increase access to electricity, such as the free basic electricity subsidy is flawed in a number of ways:

- Households without access to electricity (generally located in rural areas) are not benefiting from the subsidy;
- The implementation of the free basic electricity subsidy in non-grid areas did not happen in all areas, and uncertainty about the future of the non-grid programme contributes to the uncertainty around the non-grid subsidy; and
- Increasing access to electricity will not alleviate cooking energy shortages since poor households do not use electricity to cook with.

There is, therefore, an urgent need for Government to concentrate resources and efforts on programmes and measures that will address thermal energy requirements of low-income households because without that, poverty, health and safety issues and household energy security will never be addressed.

Conclusion and recommendations

Firstly, the paper endeavoured to illustrate the complexities surrounding household cooking energy and concludes that addressing household cooking energy in low income households will never be an easy or straightforward task. However, the complexity of the issue is no excuse for ignoring the problems associated with cooking. Secondly, the paper attempted to illustrate that despite the wealth of good energy policy in South Africa, there is a trend, especially in renewable energy to move away from the previous focus on increasing access to energy services for low income households to projects which address climate change and large scale investment issues. It is not intended to create the idea that the latter is bad, but rather to plead for a balanced approach.

It is recommended that fuel wood supply be addressed as a matter of urgency through programmes focussed on woodlots, community tree planting activities, and greening activities. It is noted that woodlot programmes may not have been successful in the past, but it is recommended to explore the reasons for their failure and to investigate new approaches. Thirdly, creative linkages between sources of fuel wood supply and demand need to be explored, for example, urban tree felling operations discard tonnes of fuel wood, for which they pay a price to dump it into dumping sites. By exploring methods to process fuel wood and supply areas where wood fuel is scarce, employment creation, income generation and addressing energy shortages can all be addressed simultaneously.

Household wood fuel use is a reality, not only in

rural areas but also in urban areas of South Africa where the slowing of the electrification programme, electricity supply disruptions and endemic poverty causes sustained wood fuel use. Household energy policy measures should also support the introduction of improved cooking stoves, especially for people with compromised immune systems, as these devices not only save wood fuel but also improve air quality. Until household energy policies address these issues, our well-intended energy policies will continue to fail poor women in South Africa

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