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Access to Affordable, Reliable, Sustainable and Modern Energy for All? An Assessment of Gender and Energy Access in Peri-Urban Zimbabwe

ABSTRACT. Access to energy is a key pillar of human wellbeing, economic development and poverty alleviation. Electricity demand exceeds supply in Zimbabwe, necessitating severe load shedding and the use of alternative energy. Utilising 40 in-depth structured interviews, this paper examines evidence of gender differences on energy access and use by Zimbabweans living in peri-urban areas. The results show that energy poverty is prevalent, underpinned by widespread poverty, contributing to constrained economic development and poor social life. Poor women, especially bear much of the burden of energy access and use, including danger to their health. Governments and development partners need to priotise energy as part of aid distribution while there is need to appoint more women in positions that shape energy policy and enact more gender neutral/friendly policies. The situation on the ground suggests that access to affordable, reliable, sustainable and modern energy for all is still a long way off for these communities. The study contributes to the ongoing global debate on energy and gender by providing evidence and insights from a developing world context.

KEYWORDS: gender and energy, electricity access, energy poverty, economic development, women's empowerment

Introduction

Background

Access to energy is widely recognised as central to economic development and to the realisation of human and social well-being (UN,

2019). Productive applications of energy include cooking, heating, lighting, food production and preservation, education and health services, mobility and communication, industrial production and transportation (World Bank, 2015). In fact, the production, distribution and consumption of energy have a considerable impact on economies, people's daily lives, environments and industrial development in any country, suggesting a positive relationship between energy and economic development (Esen & Bayrak, 2017).

Achieving universal access to electricity is essential for solving many global development challenges (Daly, 2018). Consequently, the world has witnessed increasing attention to universal electricity access as a development objective (Osunmuyiwa & Ahlborg, 2019). However, more than two-thirds of Africa's population still do not have access to electricity (Schaltuper, 2018). Compare these statistics with the fact that over 1.1 billion people, consisting largely of rural populations in developing countries lack access to electricity (IEA, 2017). It then becomes clear, that with a share of over 50% of people without electricity in the world, access to electricity in Africa is a significant problem.

The women/gender/energy research agenda is widely viewed as a critical pathway for linking energy interventions to social and economic development (Cecelski, 2004). Achieving gender equality and women's empowerment is a stand-alone goal-SDG 5, and integrated across the other goals, with many targets specifically recognising gender equality and women's empowerment as both an objective and part of the solution (World Bank, 2018). However, despite many efforts, energy poverty is widespread, and gender inequality exists at every level of the energy sector (Cecelski, 2004).

Zimbabwe had an operating capacity of 1,555MW, transmission losses of 4MW and a peak demand plus reverses of 1,724MW, implying an energy shortfall of 173MW or 11% (SAPP, 2019). According to SAPP (2019), the composition of the electricity generation mix in the country is coal electric power generation at 50.6%, hydroelectric power generation accounting for 44.4% and distillate (Heavy Fuel Oils) at 4%. The other forms of power generation accounted for just above 1%. The country has been plagued by severe power shortages attributed to a prolonged drought that has reduced output at its largest hydro plant and ageing coal-fired generators that keep breaking down, according to state-owned power utility ZESA Holdings (Banya, 2019). This energy shortfall in respect of installed capacity is an economic and social policy concern to the country.

The purpose of this paper is to assess gender and energy access and use for Zimbabweans living in peri-urban areas to appreciate their trajectory towards UN SDG goal 7- affordable and clean energy has progressed and to propose interventions that could improve their lives. This line of inquiry is necessary for a view of the prevailing energy deficiency, the pervasiveness of inequality between gender and the dearth of the empirical literature on the energy-gender nexus in the country. The paper fills an important void in the Southern African and Zimbabwe literature and contributes to the ongoing global debate on energy and gender by providing evidence and insights from a developing world context.

This paper is structured as follows: Section 2 describes the key theories and empirical findings on the energy-gender nexus. Section 3 provides an overview of the research methodology used in the study, while Section 4 presents the study's findings. Section 5 discusses the results before providing conclusions and recommendations.

Theoretical perspectives on the energy, development and gender nexus

Energy and economic development

There is consensus that energy plays a critical role in economic growth (UN, 2019), human progress and development (Mandelli et al., 2016). To the extent that the UN General Assembly has a stand-alone goal on energy, SDG 7 calling for all to "ensure access to affordable, reliable, sustainable modern energy for all." Energy facilitates access to fundamental necessities such as clean water, sanitation and health care and advances development by the provision of reliable and efficient lighting, heating, cooking, mechanical power, transport, and telecommunication services (UNDP, 2001; World Bank, 2015).

Increasing access to energy is critical to ensuring socioeconomic development in the world's poorest countries (Grimshaw & Lewis, 2010). Lack of access to modern energy services severely limits socioeconomic development, an integral part of sustainable development (IEA, 2017). There is a need to improve the accessibility of energy by finding ways by which energy services can be delivered reliably, affordably, and economically viable, socially acceptable, and environmentally sound manner (UN, 2018). The inaccessibility of energy among the population has been recognised as negatively impacting health, education, and quality of life (Malonza & Fedha, 2015).

Energy and Gender

Gender issues gained prominence in the 21st century as efforts were made to understand the dimension of every aspect of social life to serve both men and women better. Cecelski (2004) attributes the awareness of gender issues to the pressure and lobbying that women from both northern and southern countries have applied to their governments and international organisations to have better recognition of their needs and rights. In the context of energy, from supply to end use, electricity is gendered, which means that women and men have different opportunities to engage in and influence the solutions for electricity provision and different opportunities to benefit from electricity (Winther et al., 2017).

Gender roles and responsibilities vary in different cultural and geographical contexts and over time (Van de Vijver, 2007). Within the traditional African family set up for example, it is the role of men to find food while cooking food for her family is one of the significant daily activities of a woman (Khamati-Njenga & Clancy, 2003) including finding the firewood to cook that food and cleaning the home. Women need sustainable energy services that address two recurrent problems in their lives: cooking and drudgery (Assmann, Laumanns & Uh, 2016). However, numerous statistics show that women are more affected by the lack of access to energy services (Malonza & Fedha, 2015).

Zimbabwe has always strived to achieve gender equality since its political independence in 1980 (Chabaya, Rembe & Wadesango, 2009). The country's 2013 Constitution provides a strong legal framework for promoting and attaining gender equality and women's empowerment (UN, 2019). The country is also a signatory to important regional and international human rights instruments. The UN in Zimbabwe acknowledges that despite the legal commitment to gender equality at the international, regional and national levels, women and girls in Zimbabwe continue to face a myriad of challenges in the political, social and economic spheres as a consequence of gender inequalities and imbalances.

Energy Sources in Africa

The energy access situation in the least developed economies (LDCs) and sub-Saharan Africa is severest in these countries (UNDP, 2009). Energy sources in use in Africa include charcoal, petroleum-based cooking fuels (kerosene and LPG), biofuels, electricity (UNDP, 2005) as well as solar energy. The World Bank (2015) argues that for energy to be meaningful

for households, the energy source must meet the following attributes—adequate in quantity, available when needed, good quality, reliable, convenient, affordable, legal, healthy and safe.

Women in rural communities in developing countries rely on the traditional biomass fuels of wood and animal waste to complete their household tasks (UNDP, 2005). Although biomass is collected at zero financial cost, its major draw-back is its quality. In sub-Saharan Africa, air pollution from wood fuels in inefficient stoves or open fires is responsible for 1,100 respiratory-related deaths per day, primarily of women and children (AfDB, 2008). A less reported problem linked to firewood collection is that of sexual harassment (Patrick, 2007). The 2012 Census National Report confirms that 63% of Zimbabwe's population relies on wood as the main energy source for cooking and heating purposes (Nhambura, 2014).

Kerosene and LPG have the advantage that they are available through well-established commercial distribution channels (Assmann, Laumanns & Uh, 2016). Households in rural areas tend to use kerosene (paraffin) for lighting, which they usually purchase in smaller quantities (Tracy & Jacobson, 2012) to match household cash flows (Assmann, Laumanns & Uh, 2016). Urban and peri-urban households widely use kerosene for cooking. LPG is non-toxic and is considered clean because it can be burned very efficiently and emits few pollutants (Bailis, 2004).

Although grid electricity is often seen as an optimum energy source due to its cleanliness and convenience, it is not the cheap (Assmann, Laumanns & Uh, 2016). For those who have access to electricity in rural areas, lighting, and television use account for at least 80% of electricity consumption, while only 2% of the rural population use electricity for cooking (UNDP, 2009). The popularity of social networks has seen the charging of mobile phones increase in importance as an added use of electricity.

The use of solar energy is rising in worldwide energy markets as it becomes the cheapest source of electricity generation in many places, including China and India (IEA, 2017). The cost of solar panel modules has decreased significantly, while their efficiency has increased greatly with advances in technology, making solar power accessible to households in poor communities (Kabir, Kim & Szulejko, 2017). However, solar home systems cannot be used for cooking since their output is low (Assmann, Laumanns & Uh, 2016). They find ready use in lighting and charging of mobile phones.

People who use biogas speak highly of its controllability and cleanliness. On the negative side, the cost of a digester and the number of animals required to produce sufficient gas for the household's daily cooking needs

is usually beyond low-income households (Wisconsin Bioenergy Initiative, 2011). The collection of water needed as an input to a biogas system adds considerably to women's burden, i.e. (the time spent on fuel collection is switched to water collection).

Zimbabwe had slightly more than three million households in 2015, 44% of which were are electrified. As a result of the unreliability of national energy production, many citizens have turned to more alternative sources of energy: solar power and wood fuel. Sixty-two percent of households without electricity use biomass as the main source of energy for cooking, especially in rural areas where 90% live without access to energy (Mukeredzi, 2015). Rural communities meet 94% of their cooking energy requirements from traditional fuels, mainly firewood, while 20% of urban households use wood as the main cooking fuel, which they fetch from nearest forests (Mukeredzi, 2015).

Research methodology

The research adopted a phenomenological research philosophy as guided by the research objectives. The qualitative paradigm is useful at capturing narratives of energy access and use including any challenges that may be experienced through this process. The study utilised in-depth structured interviews with residents of peri-urban communities in Zimbabwe—Domboshava, Mt Hampden, Chishawasha and Cresta communities where issues of energy access, use and gender are topical.

Domboshava is a village in the province of Mashonaland East, located about 27 km north of Harare. Mount Hampden is a village in Mashonaland East province, about 18 km from the capital Harare. Chishawasha is a Roman Catholic Jesuit mission located about 25 km east of Harare, while Cresta is a farming area 5 km south of Harare. All these areas can be described as peri-urban settlements whose inhabitants are mostly poor and unemployed. The four areas have a population in excess of 30,000 people with prevalent poverty levels of 85%.

The research approach selected is consistent with a growing trend towards qualitative methods in empirical enquiries at the gender/energy/development interfaces (Chirau, 2015). In any case, adopting such an approach in peri-urban areas may be the only way of obtaining information from the residents, given their limited education to be able to competently complete the questionnaires. Ten focused interviews were conducted in

each area, for a total of 40 interviews. The sample size for interviews was based on the authors' subjective evaluation in terms of time frame, financial resources and availability of willing interviewees. In order to amplify the opinions of women, a ratio of 7:3 for women to men were interviewed. The rationale was that it is women and not men who bear the brunt of the problems and inconveniences associated with limited access to energy, because of their traditional roles in the home.

Each interviewee was requested to confirm residency in the area concerned before the interview could begin. The researchers went from door to door conducting the interviews. Participation in the interviews was voluntary and each interview lasted on average 20 minutes. A formal introduction was made outlining the aims of the research. Ethical considerations entailed adequately informing respondents on the nature and purpose of the study, maintaining confidentiality and anonymity, seeking voluntary participation and informed consent for participating in the research.

An interview schedule was used to collect data using in-depth one-on-one interviews. The local language, Shona, was used to gather information on the type of energy interviewees were using, the reliability of the energy type, perceptions on the type of energy interviewees were using, the cost of the energy type and the interviewees' ability to afford each particular energy type. In addition, the study sought to establish what impact the lack of energy or its interruption had on their lives in terms of eating habits, health, income generating projects and the schooling for their children. The authors are well-trained in interview techniques.

Qualitative data was fully transcribed on the same day to ensure all pertinent issues were captured correctly and on time. The Gender Analysis approach which interrogates variables such as gender division of labour, access to and control over resources, gender needs and interests, was used in analysing data. The transcribed data were classified and coded into different categories in order to identify emerging themes. Content analysis was used to analyse the data. A narrative by participants with participants' quotations in key sections is provided in the discussion.

Results, discussion and recommendations

Mt Hampden Area

Of the ten interviewees in the Mt Hampden area, the oldest was male, unemployed and 67 years old; whilst the youngest was female, unem-

ployed and 18 years old. The interviewees had an average age of 39.7 years. Only two interviewees (one male, one female) were formally employed, four (one male, three female) were self-employed while four (one male, three female) were unemployed.

One male respondent had a monthly income range of ZWL$2101 to $2800, one female had a salary range of ZWLS$1401 to $2100, four (one male and three female) were on a salary range of ZWL$701 to $1400 while the other four (three females and one male) were on a salary of less than ZWL$700.

a. Electricity supply

Six of the interviewees had grid electricity connected to their homes while four had no electricity connected. Of those connected, four said electricity supply was reliable while two said electricity supply was unreliable. Three said they experienced the loss of power once per week; two said once per day, while one said twice per day. Hence, in the Mt Hampden area, an electricity supply is considered reliable, and there is a power outage once per week.

Of those with electricity connected to their homes, three said they needed electricity especially between 6 am to 8 am for cooking, two said they needed electricity more between 4pm and 6pm while one said she needed electricity between 10 am and 12 pm for cooking. One female interviewee said, 'I need electricity between 6 am and 8 am for lighting and cooking breakfast for my family. In winter, it is pitch dark around 6 am and lighting is required in the house.'

Another female interviewee said, 'I need electricity between 4 pm and 6 pm to cook supper for my family after a long day's work at school and work. During this time, we can also listen to the news.'

Electricity outages were concentrated between 4 pm and 6 pm; according to four interviewees (all female), two respondents (one male and one female) said power outages occurred between 8 am, and 10 am. Hence, for the Mount Hampden area, power outages occur during the day between 4 pm and 6 pm.

All interviewees lamented the difficulties of recharging their mobile phones during electricity outages to communicate with their loved ones. Two male respondents raised the point that electricity outages were disrupting family time, while the four female respondents expressed concern over the fact that sometimes they could not iron clothes for their family,

that eating habits and times and the quality of food were being affected. The male respondents expressed displeasure at being unable to listen to the news or radio and keep abreast of current affairs.

b. Alternative energy sources

The four interviewees who had no electricity connected to their homes said they used firewood for cooking. Two of these said they used candles for lighting their homes, while the other two used kerosene lamps. For those with electricity connected (six), the alternative energy for cooking, in periods of power loss, was firewood (five) and solar energy (one). Of these, three used kerosene lamps, while the other three used candles for lighting. Hence, firewood was the main alternative to electricity for cooking, while candles and kerosene lamps were the main alternative to electricity for lighting. Interestingly, all interviewees said the burden and responsibility of fetching firewood rested on females because it was their traditional role.

All interviewees complained that firewood emitted too much smoke and some said they suffered from headaches and eyesight problems as a result, and in two cases, female interviewees complained of breathing problems and chest pains.

There was consensus that, although affordable, firewood was not reliable. The major drawback was that firewood was difficult to find. Said one lady, 'We walk long distances to go and fetch firewood'.

Another said, 'It is becoming increasingly difficult to get firewood as it is becoming more scarce. Sometimes all we have for cooking is cow dung.'

On lighting, both candles and kerosene lamps were deemed affordable but unreliable. Said one female interviewee, 'candles are unreliable because they give so little light, wind can extinguish their flame. To light a large room, you need two or three candles for effective light.' Another female said of kerosene lamps, 'their light is weak, you need two or more to light a standard room, but their major problem is that they emit too much smoke.'

c. Preferred energy type

Most interviewees said they preferred electricity for both cooking and lighting. They provided different reasons for their preference.

One female interviewee said, 'electricity is much better than firewood.'

A male interview said, 'when available, electricity is more reliable than firewood for cooking or candles for lighting.'

Domboshava

The oldest interviewee in Domboshava was female, self-employed and 40 years old, whilst the youngest was also female, 15 years old and still at school. The average age of the 10 interviewees was 25 years. While no interviewee was formally employed, five were self-employed, four were still at school while one was unemployed.

One female had a monthly income in the range ZWL$1401 to $2100, one male had an income between ZWL$701 to 1400, three females had an income of less than ZWL$700 while four (two males, two females) were at school while one female had no income.

a. Electricity supply

Four of the interviewees had electricity connected to their homes while six had no electricity connected. Of the four who had electricity, three said electricity supply was not reliable, with power outages occurring once per day. Hence, in the Domboshava area, electricity supply is unreliable and there is power outage once per day.

Of the three interviewees who had electricity connected to their homes, three said they needed electricity especially between 6 am to 8 am for cooking, two said they needed electricity more between 6 pm and 8 pm while one said she needed electricity between 6 am and 8 am for cooking.

A female student respondent said, 'I need electricity between 6 pm and 8 pm to study and do my homework.' Electricity outages were concentrated between 4 pm and 6 pm; according to all three interviewees Hence, for Domboshava area, significant power outages occur during the day between 4 pm and 6 pm.

One female interviewee said that sometimes they go to bed without cooking, 'we eat bread, taking it with drink and go to bed.'

Two female interviewees said, 'we are unable to watch television and keep abreast of current events, even communicate with our friends on social media'.

Three male interviewees said, 'they are unable to read the newspaper or other books in the comfort of their homes'.

b. Alternative energy sources

Of the six interviewees (all female) who had no electricity connected to their homes, four of them said they used firewood for cooking while two said they used kerosene stoves for cooking. Three interviewees said they used kerosene lamps for lighting, two said they used candles while one said she used an electric generator. Hence, firewood is the main alternative to electricity for cooking while kerosene lamps were the major alternative to electricity for lighting. All the female interviewees said the burden and responsibility of fetching firewood rested on them because it was their traditional and cultural role.

All interviewees complained that firewood emitted too much smoke resulting in running tears and headaches while cooking. Three female interviewees who used kerosene stoves for cooking said paraffin smell is unpleasant while one male interviewee who used a generator for lighting complained of too much noise.

c. Preferred energy type

Eight interviewees said they preferred electricity for both cooking and lighting. They provided different reasons for their preferences.

One female interviewee said, 'Electricity is more reliable for cooking and lighting when available,' while another female said 'lighting from electricity was more effective."

Chishawasha

In Chishawasha, seven women and three men were interviewed. The oldest interviewee was female, unemployed and aged 43 years old, while the youngest interviewee was also female, still at school and aged 19 years old. The interviewees had an average age of 33 years.

Two interviewees were formally employed, three were self-employed, four were unemployed while one was still at school. One male respondent had a monthly income of ZWL$1401 to $2100, three (one male, two females) had an income of $ZWL701 to 1400, four (three females) had an income of less than ZWL$700, while two (one male, one female) had no income.

a. Electricity supply

Five of the interviewees had electricity connected to their homes while the other five had no electricity connected. Of the five who had electricity

connected, four (two females, two males) said the electricity supply was not reliable while one female said the electricity supply was reliable. Three said they experienced loss of power supply twice per day, one said once per day while another one said more than twice per day. Both men and women were united in their position that electricity supply was unreliable. Hence, in the Chishawasha area, electricity supply is considered unreliable and there are power outages twice per week.

Of the three interviewees who had electricity connected to their homes, two said they needed electricity especially between 4 pm and 6 pm, while one said they needed electricity between 6 am and 8 am. One male interviewee said, 'I need electricity between 4 pm and 6 pm to do my school homework'. Electricity outages were concentrated between 4 pm and 6 pm; according to two of the three interviewees. Hence, for Domboshava area, power outages occur during the day between 4 pm and 6 pm.-

One male interviewee said that, 'I need electricity to read my novels and school notes.'

A male interviewee said he needed electricity, 'to read and watch television.'

b. Alternative energy sources

Of the five interviewees (two males and three females) who had no electricity connected to their homes, all of them said they used firewood for cooking with one using a gas (LPG) stove when funds permitted. On lighting, three said they used candles, one said he used solar energy and the other one said she used kerosene lamps. It was interesting to note that the type of energy used was somehow related to their level of income-those with higher incomes tended to prefer electricity and LPG, while those with lower income tended to focus on kerosene and wood for cooking and lighting.

The interviewees were united in their agreement that firewood supply was unreliable, as it was difficult to find, although it was affordable. Said one female interviewee, 'We now travel longer distances to fetch firewood than we used to do some five years ago'.

Another female said, 'Most trees have been cut down and finding firewood is now a struggle.'

On lighting, both candles and kerosene lamps were deemed, affordable but unreliable. Said one female interviewee, 'we normally use one candle in the kitchen but because of the smoke from firewood, it provides inadequate light. Providing two candles would be expensive.'

On kerosene lamps, one female interviewee said, 'kerosene lamps emit too much smoke which is bad for our health and their light is too weak to enable effective reading for children's homework'.

c. Preferred energy type

All the interviewees said they preferred electricity for both cooking and lighting. They provided different reasons for their preference.

One male interviewee said, 'When available electricity is cheaper and reliable'.

Another female interviewee said, 'electricity is so much more convenient, there is no smoke and it is more effective.'

A female interviewee said, 'electricity does not cause damage to our cooking utensils in the way that firewood does, so in the long run firewood costs us more money if we factor in the cost of buying new pots to replace damaged pots.'

Cresta

The fourth and final set of interviews were held in Cresta, a farming community about 20 km south of Harare. The oldest interviewee was female, unemployed and aged 50 years old, whilst the youngest interviewee was also female, unemployed and aged 20 years old. The interviewees had an average age of 33.8 years.

Three interviewees (one female, two males) were formally employed, one female was self-employed while six (one male, five females) were unemployed. One male interviewee had a monthly income in the range ZWL$2101 to $2800, three (two males, one female) had an income of ZWL$701 to 1400 while six (females) had an income of less than ZWL$700.

a. Electricity Supply

Five of the interviewees had electricity connected to their homes while the other five had no electricity connected. Of the first five, four said electricity supply was unreliable while one said it was reliable. Three said they experienced loss of power supply once per day while two said once per week. Hence, in the Cresta area, electricity supply is considered reliable and there is a power outage once per week.

Of the five interviewees who had electricity connected to their homes, three said they needed electricity especially between 6 am to 8 am for

cooking while two said they needed electricity more between 6 pm and 8 pm. One female interviewee said, 'I need electricity between 6 pm and 8 pm to study and do my homework.'

Women worried more about the difficulties of cooking and cellphone recharge while men were concerned with radio, television, and cellphone recharging. Electricity outages were having an adverse effect on both men and women but in different ways. Electricity outages were concentrated between 4 pm and 6 pm; according to all the five interviewees. Hence, for Cresta area, power outages occur during the day between 4 pm and 6 pm.

b. Alternative energy sources

Of the five interviewees (four females, one male) who had no electricity connected to their homes, three said they used firewood for cooking while two said they used kerosene stoves for cooking. Three female interviewees said they used kerosene lamps for lighting while two said they used candles. Hence, firewood is the predominant alternative energy source to electricity for cooking while kerosene lamps were the major alternative for lighting. All the female interviewees said the burden and responsibility of fetching firewood rested on them because it was considered their traditional and cultural role. One male said, 'he buys firewood if he can it and he has money to reduce the pressure of fetching firewood on his wife.'

c. Preferred energy type

Eight interviewees said they preferred electricity for both cooking and lighting.

One female interviewee said, 'Electricity is more reliable for cooking and lighting when available.'

Another female interviewee said, 'electricity is more efficient than firewood'.

Discussion and way forward

Electricity supply in the four communities understudy is unreliable and characterised by frequent blackouts. Hence, a situation of energy poverty exists, which is a serious hindrance to economic and social development. The situation is further compounded by the fact that the communi-

ties' main alternative to electricity—firewood, is fast being depleted. Other sources of energy such as generators, biofuels and solar systems are either too expensive for these poor communities or detrimental to their health.

The average income for the 40 interviewees was less than ZWL$700 per month. With the country's Poverty Datum Line (PDL) for an average family of five at ZWL$3700 as at November 2019, all interviewees were living in poverty. This situation has serious negative implications on the interviewees' ability to access the energy type of their choice because the major constraint is affordability. Hence, they suffer two types of poverty, which incidentally are interconnected—poverty of resources and energy poverty.

Energy poverty creates significant social challenges for communities. Energy to light the home, energy to do homework, energy to cook, energy to warm the water or energy to listen to the radio or television is a daily struggle for these communities. Energy for incoming generating projects like chicken rearing, welding or growing mushrooms all depend to some extent on energy supply. Direct consequences of energy unavailability include afflictions for urban dwellers such as energy collection trauma, communication difficulties with loved ones, difficulties in keeping abreast with current affairs, skipped homework and multiple environmental burdens (Malonza & Fedha, 2015) as well challenges with income generating projects.

Male interviewees decried the fact that electricity outages were disrupting family time. They also expressed displeasure at being unable to listen to the news on the radio or watch television to keep abreast of current affairs. Female interviewees on the other hand, expressed concern over the fact that sometimes they could not iron clothes for their families, that eating times and habits had changed while the quality of prepared food was negatively affected. In all the four communities, female interviewees spoke about the negative impact the lack of energy was having on their children's homework. Clearly, electricity outages were having a negative effect on both men and women but in different ways. All respondents lamented the difficulties of recharging their cellphones so that they could communicate with their loved ones, during blackouts.

In the peri-urban areas under study, biomass and agricultural waste provided the bulk of the energy that is required in areas where there is no electricity or during periods when electricity supply interruption. Kerosene ranked as the next energy alternative after biomass followed by LPG (gas), which is used on a much smaller scale. Although firewood

was affordable, women said it was not reliable in terms of its performance (different types of wood burn differently—some more than others, wet wood is difficult to burn) and is increasingly becoming difficult to find. The smoke emitted from wood is damaging to their health. Candles and kerosene lamps provide weak lighting and in an environment of smoke, their use is rather limited. They also pose a danger of fire and burns. Although clean, solar energy costs are beyond the reach of many in peri urban communities.

Clearly, the above narrative shows that women suffer the brunt of energy poverty because of their traditional role in society. The problems caused by energy poverty are borne mainly by women and girls whose traditional role is to fetch firewood, cook the family meal and clean afterwards. These problems include significant waste of time on energy-related errands such as fetching firewood or biomass (drudgery), health problems from these kinds of energy sources, challenges in completing homework where it is little or no energy, communication blues—no WIFI or power for batteries, problems keeping abreast with current affairs either on radio or national television, compounded by the poverty of resources. This situation perpetuates gender inequality.

So, what is the way forward? Solutions lie in the government subsidising biofuels and or solar systems to make them readily accessible to these poor communities. Stoves that reduce the emission of smoke need to be made available to rural and peri urban populations. Governments, NGOs and aid organisations have done very well by distributing food aid in times of difficulty but none have had energy as part of their priority. They need to prioritise energy when they do their normal aid distributions.

Male policy makers dominate the African policy making landscape. Policy makers need to be sensitised to the energy challenges that their populations but more specifically, women face in energy access and use. This should enable policy makers to come up with gender friendly policies and energy frameworks that reduce the burden of energy access and use on women. In addition, more women are required in positions influencing energy policy. In addition, the inclusion of more women in energy policy making positions would help make energy polices help make energy policies more gender friendly.

Access to affordable, reliable, sustainable and modern energy for all? This is a long shot for these communities, especially for the women. For a start electricity is neither reliable, affordable nor adequate as characterised by frequent blackouts. Alternative energy sources such as biomass

and kerosene are of poor quality causing health related problems mainly to women and children while electricity, solar and LPG are expensive. This situation continues to retard the development of these community, negatively affecting women more.

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