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Gender, Firewood and Health: The Potential of Ethnography to Inform Policy and Practice

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Introduction

The UN estimates that, daily, around three billion people have their food cooked on biomass, such as firewood, charcoal, dung and agricultural residues (UN SEforAll GTF 2015). While the food provides the people with the nutrition, the smoke from the fuel used to cook the food has negative health impacts. There is a significant body of epidemiological evidence detailing the health impacts of exposure to household air pollution (HAP) from burning wood inefficiently. The World Health Organisation (WHO) estimates that 4.3 million people die prematurely

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each year due to HAP illnesses specifically associated with cooking[1] (WHO 2014). These effects are gendered. Prolonged exposure to HAP, primarily of women who have the largest share of the responsibility for cooking, is linked to a range of medical conditions including cardiovascular disease, low birth-weight and perinatal mortality, eye diseases including cataracts and blindness, asthma, increased risks of maternal depression and nasopharyngeal and lung cancers (Putti et al. 2015). Using cleaner fuels and technologies is considered to have positive impacts on reducing the risk of Chronic Obstructive Pulmonary Disease (COPD). Women practicing clean cooking are 50% less likely to suffer from COPD than women exposed to high levels of indoor smoke.[2] Further, men and boys are also affected by HAP when they, particularly young boys, spend time in the kitchen where cooking is done,[3] or where men work as cooks, for example in hospitals. Men are also more likely to have significant underlying health issues, including a heightened risk of COPD due to smoking, which increases their relative risk of mortality from HAP-associated illnesses.[4]

In the 1990s, it was estimated that, in sub-Saharan Africa, 77–93% of the time and effort spent on fuel wood collection was provided by women (Calvo 1994). Much of this biomass is headloaded, with weights up to 70 kg being recorded (Matinga 2010). In a few countries, men are the primary carriers, for example in Madagascar where men spend an average of 39 minutes each day collecting firewood, compared to women's 8 minutes on average (UN 2015). Carrying firewood on heads and backs over long distances has been linked to musculoskeletal injuries, chronic pain and acute injuries (Matinga 2010). A study of Congolese women who had headloaded

[1] Other household energy services such as boiling water for bathing, space heating and lighting also contribute to HAP. In rural areas, cooking animal fodder in the household kitchen is another potential source. https://www.who.int/airpollution/household/pollutants/combustion/en/ (Accessed 30 May 2019).

[2] https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health. (Accessed 2 June 2019).

[3] Depending on culture, boys or girls will spend more time in the kitchen and hence siblings will have different exposure levels. For example, in Gambia, girls are more likely to be carried on their mothers' back and in India boys are more likely to be carried or kept around the kitchen area (Mishra 2004).

[4] https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health. (Accessed 2 June 2019).

firewood for an average of 12 years found that these women, compared to women in control groups, developed degeneration of the upper cervical spine and an increase in slipped vertebrae discs (Echarri and Forriol 2002). Other studies have found an increased risk of uterine prolapse due to increased pressure on pelvic organs when carrying heavy loads, such as firewood, on backs or heads (Ravindran et al. 2000; Bonetti et al. 2004).

Another health issue, which is very difficult to document due to its sensitive nature, is that of physical and sexual violence which women are reported to suffer while out collecting wood (Haile 1989; Potgieter et al. 2006; Matinga 2010; Porter et al. 2013). Most of the available documented evidence comes from displaced persons camps (MSF 2005; Kasirye et al. 2009). In West and South Darfur, Sudan, *Médecins sans Frontières* (MSF) reported that, between October 2004 and mid-February 2005, they treated nearly 500 women and girls who had been raped, of whom it is estimated that 82% were raped when they went to search for firewood, water or animal fodder (MSF 2005).

This brief overview of the literature shows that there is a nexus of gender, firewood and health. Our own extensive literature review allowed us to understand the context and state of knowledge regarding this nexus and identify gaps in the issues addressed. However, we argue, much of the existing literature does little to unpack the nexus complexities. In drawing on this literature, we have two objectives in this chapter. The first is to show that the shortcomings in energy policy and practice, which neglect gender and socio-cultural issues in general, and health in particular, are linked to the approach used in developing energy policies and practices. We take South Africa as a case study because its post-apartheid energy policy has focused on improving modern energy access with a strong social agenda. In other words, it sees energy not only as a supply side issue of improving availability but also as a policy intended to achieve social objectives such as improving the health of particular target groups. The South African energy policy has been in existence for sufficient time for experiences to have been built up that can provide important lessons for countries attempting universal energy access while simultaneously trying to achieve the Sustainable Development Goals (SDGs), two aims that are mutually reinforcing. The second objective is, using two cases in rural South Africa, to show how an ethnographic approach can

illuminate certain aspects of phenomena which quantitative or rapid qualitative methods overlook. We focus on the health impacts of firewood collection since, compared to the health impacts of firewood for cooking, this is an under-researched area.

Methods

This chapter is informed by a review of the peer-reviewed and grey literature on gender, firewood and health, policy analysis and data gathered through ethnographic fieldwork in Eastern Cape, South Africa, in 2007 and 2010. Our hypothesis is that by ignoring lived experiences and interpretations that support the continued use of firewood, even when modern energy becomes available, aspects of how best to address the identified problems are missed. This led us to adopt grounded ethnographic methods to uncover lived experiences without limiting respondents to predetermined options. At the start of the study, we identified broad themes from the literature and from scouting field visits. These themes helped us explain to respondents what the study was about and to obtain permissions and informed consent from authorities and respondents.

Data were collected in two villages in Eastern Cape province (Cutwini and Tsilitwa—see below for basic data) through semi-structured and open interviews, focus group discussions (Cutwini only), key informant interviews, interviews with clinic users, observations and through participation in village life. Interviews were conducted with heads of households, those most commonly responsible for acquiring and using household energy, students, teachers, health workers, village heads and prominent village members suggested by other villagers. We used grounded theory methodology to inductively develop new analytical categories for data collection and analysis as data emerged (Glaser and Strauss 1967; Charmaz 2006). In total, we conducted 75 household interviews in Cutwini and 89 in Tsilitwa. Data were also assembled through observations of life in various homesteads (where the first author of this chapter [MNM] lived), participation and observations at weddings, funerals and traditional ceremonies such as *umgidi*, observations of mobile clinic days (Cutwini), clinic operations (in Tsilitwa) and at a

village school including teaching at the school for one week. Participation in home life activities included collecting firewood, cooking and collecting water.

MNM spent five months living in Cutwini (three months in 2007 and two months in 2009) and five months living in Tsilitwa in 2009. She has since returned to these villages and particularly to Cutwini over the years up to 2013. In the villages, all the interviews were conducted in isiXhosa (the local language) with the help of a local interpreter and later by the first author (after gaining adequate proficiency in isiXhosa). With government officials, utility staff, teachers and nurses, the interviews were in English or a mix with isiXhosa. Interviews were recorded on a digital data recorder, transcribed, and read several times. Field notes and memos were written throughout the stay, and all extensive observation notes were time stamped. Data were analysed through coding techniques.

South Africa Energy Policy: Brief History from the End of Apartheid to 2018

This section outlines South Africa's energy policy commitments with respect to households and some relevant commitments to health and to gender equality. The focus is on energy policy in the post-apartheid period since many policies then changed to focus on addressing past injustices and inequalities, not only racial but also gender-based inequalities. Several provisions in the Energy Policy reflect this trajectory.

In 1998, the South African government published a new energy policy (DME 1998). The policy was based on years of research—primarily quantitative data, modelling of energy supply and demand, and rapid qualitative methods—and negotiations about how to make modern energy services more equitable. The 1998 Energy Policy had five objectives:

- Increasing access to affordable energy services: this included a commitment to promote access to *affordable energy services for disadvantaged households*
- Improving energy governance, in part through accountability, transparency and representation, especially of "*blacks and women*"

- Stimulating economic development through competition, addressing market failures and ensuring effective delivery of energy services to consumers
- Managing energy-related *environmental and health impacts,* including through the promotion of basic energy services for poor households to "*address the negative health impacts arising from the use of certain fuels*"
- Securing supply by diversifying energy trade opportunities, diversifying sources and diversifying primary energy carriers

NB: Italics applied by the authors to highlight provisions relevant to gender and/or health issues.

Objectives 1 and 2 are directly relevant in addressing three intersecting groups in terms of energy and health: disadvantaged households, blacks, and women. Objective 4 would also probably benefit these three groups since they tend to use polluting fuels such as firewood, dung and coal.

National electricity access increased from 35% in 1990 to 84% by 2011 (STATSSA 2017). As such, more disadvantaged and black households have electricity than before. For example, in Eastern Cape, where our two case study villages are located and a province particularly neglected during the apartheid era, access increased from 55% in 2002 to 70% in 2007 (STATSSA 2017)).

Access to electricity has had some influence on the energy sources used for cooking. National statistical data show that, for cooking, there has been a steady but slow decrease in wood, coal and paraffin use whereas electricity use for cooking has increased (Table 3.1). Such quantitative data is used to track progress towards meeting objectives 1 and 4 of the energy policy, as well as to meeting SDG 7.

Nevertheless, although access to electricity had increased, Prasad and Ranninger (2003) noted a persistent use of multiple fuels—fuel stacking—for some applications, especially for cooking. Electricity use was low among newly electrified households, and affordability was identified as one of the reasons. In response, the government introduced the Free Basic Electricity (FBE) policy in 2003 (DME 2003), which mandated the

Table 3.1 Changes in main fuel for cooking between 2007 and 2017 in South Africa (as percentage of households)

Main cooking fuel	2007	2010	2017
Coal	2.2%	1.2%	0.4%
Wood	13.9%	13.7%	8.4%
Paraffin	14.1%	8.4%	4.2%
LPG	2.2%	2.2%	4.2%
Electricity	67%	72.1%	75.9%
Other	0.6%	2.5%	6.9%

STATSSA (2017)

relevant provider (ESKOM or the municipality[5]) to provide 50 kWh per month to low-income households (referred to in policy as "indigent") for free. Davis et al. (2008) showed that, one year after FBE was introduced, electric stove ownership had increased by 18.75% with an average increase of 22 kWh/month in electricity consumption. Such research results were interpreted to mean that affordability was the barrier to electricity use. FBE was criticised for benefitting already electrified areas while neglecting the poorest and/or physically isolated communities that remained without electricity. Following this criticism, the government developed the Free Basic Alternative Energy (FBAE) policy, providing options including paraffin, liquid petroleum gas, bio-ethanol gel and coal.[6]

We would argue that the quantitative data hides several issues. The policies have focused on electricity, which rarely completely displaces firewood, especially in rural households. For example, in 2008, over 80% of rural households in South Africa were reported to use firewood as their primary source of energy (Damm and Triebel 2008). In Tsilitwa, over 97% of households still used firewood for cooking despite having had electricity for six years.

In contrast to the extensive electrification programme, policies and programmes specifically targeting clean thermal energy for cooking and heating have been sparse and short term. An example is the Basa Njengo

[5] ESKOM is the national power utility. In South Africa, some municipalities generate and distribute electricity and set tariffs.

[6] We would argue that the inclusion of paraffin and coal contradicts the Energy Policy objective of promoting basic energy services for poor households that address the negative health impacts.

Magogo programme whose introduction was based on health studies on the effects of particulate matter from domestic coal use. The programme was introduced by the Department of Minerals and Energy in 2008 to promote an alternative fire ignition method which had been shown to reduce smoke emissions compared to the traditional bottom-up ignition method (Mabudhafhasi 2011). However, the programme has not moved beyond the pilot stage.

A conclusion that can be drawn from an assessment of the South African energy policy is that while it has made strides in enabling access to modern energy, that objective 4 of managing environmental and health impacts of "certain fuels" has not been achieved. "Dirty" solid fuels continue to be used, particularly in low-income households, and especially by poor black women in rural areas. A possible explanation is that, since 1998, South Africa's energy policy and practice has given prominence to reducing the historical race-based exclusions from clean energy access. This led to a technology deterministic approach being taken, extending the provision of a technology that had been denied to many black people but provided to white populations, without understanding why people use firewood beyond its "technical" function of providing an energy service such as cooking or space heating.

In the next section, we identify, based on two case study villages in Eastern Cape (Cutwini and Tsilitwa), gaps in the understanding of the context in which the energy-health-gender nexus occurs. We present the lived experiences of rural women and men in these villages with the aim of providing insights into their gendered energy and health experiences. In doing so, we offer explanations for why electricity's versatility is not fully embraced by villagers and firewood use continues.

Results

Case Study Sites

This section provides an outline of the two case study villages: Cutwini and Tsilitwa. Both villages are primarily inhabited by members of the Xhosa ethnic group. The two sites represent, at the time of the study, the

Table 3.2 Physical infrastructure resources in Cutwini and Tsilitwa between 2007 and 2010

	Cutwini	Tsilitwa
Electricity	No	Yes
Clinic	No	Yes
Piped water	No	Yes, communal
Primary school	No	Yes
Secondary or high school	No	Yes
College or post-primary education	No	Yes
Road condition	Poor. Sometimes unpassable in rainy season	Reasonable, passable year-round
Post office[a]	No	Yes

[a]Post offices in rural South Africa are critical to accessing government welfare grants as well as other services. In Cutwini, government officials visited once a month (but were sometimes late or missed dates) to dispense welfare grants

two extremes, in terms of infrastructure and public service availability, in rural South Africa. Cutwini was very under-resourced, while Tsilitwa was relatively well resourced (Table 3.2).

Both villages have high unemployment and under-employment rates. Inhabitants are highly dependent on government social welfare payments. Over 90% of respondents in each village had one or more household members receiving some type of welfare payment from the government. The government is the largest employer in both villages. There are a few teaching jobs (available in both) and nursing jobs (only in Tsilitwa) that are considered well-paid compared to other jobs in the area.

The two villages show several features that are critical to understanding the context in which policy implementation occurs. Poor transport contributes to low LPG use, particularly in Cutwini, but limited capacity to pay is also a factor. There are fewer opportunities for women to earn an income than there are for men. Men migrate to urban centres for work while largely women remain in the marital or natal villages taking on increased levels of household and community work. They also have limited education which reduces their capacity to earn income which they could use to pay for LPG.

At the time of our study, Tsilitwa had had grid electricity for about six years. We found five households not using electricity for cooking at all, either because they were not electrified or because of other factors. Two elderly women were not aware of the subsidies to help them have access, and in two households the power supply was insufficient to use electricity for cooking. A fifth household had a connection but considered electricity too expensive to use for cooking.

Although 95% of those with a sufficient electricity supply to power a cookstove stated that they used it for cooking, we found that fuel stacking, also using firewood, dung and paraffin, was the norm. Firewood was the most commonly used source of energy for cooking and heating homes. Reasons given for fuel stacking included not being able to afford electricity for all cooking, the ability to simultaneously cook several items on an open fire, to use different pot sizes and types, the need for heating in winter, cultural beliefs relating to uses of fire and the meanings of the fireplace and personal preference including food taste and flavour.

About 94% of responding households (78 out of 83) used dung and particularly in the dry season. Dung is the preferred fuel for baking bread, especially by families without electric ovens (as is generally the case). It is also used for heating bath water and cooking meat in large batches, often for ceremonies. Paraffin use continues, especially for making tea and quick meals and, in a few households, for heating.

Insights and Gaps Exposed by Ethnography from the Case Studies

We now present five insights that show gaps in knowledge related to explaining the limited uptake of modern energy. These insights emerged from the ethnographic approaches used, which we contend would not have been uncovered by standard quantitative and/or qualitative field work methods.

Insight 1: Uncovering Unacknowledged Health Impacts of Firewood Collection

Table 3.3 Women's self-reported health impacts and experiences of firewood collection in Cutwini and Tsilitwa

Reported impact	Total number of women reporting Cutwini (n = 55)	Total number of women reporting Tsilitwa (n = 27)
Upper back pain	24	10
Back pain	19	13
Whole body pain	16	7
Waist pain	12	1
Accidents	12	3
Broken bone	2	3
Cuts and bruises	10	5
Neck pain	6	10
Mid-back pain/chest pain	6	4
Legs	7	1

Source: Matinga (2010: 154)

Table 3.3 lists women's self-reported health issues and threats faced during firewood collection and preparation as described during the interviews. The terms used represent spontaneous reactions rather than responses to a researcher's checklist of possibilities. During MNM's informal conversations, as part of daily social interactions, it emerged that the number of occurrences of the listed impacts was higher than reported in formal interviews. This would imply that the numbers of reported incidents (as shown in the table) are underestimated and that other types of impacts may not be included at all. In the next paragraph we offer an explanation of this reporting behaviour by unpacking an "incident".

The term "accident" in Table 3.3 is a very general term that respondents used to cover a range of injuries. At home, women reduce the firewood into smaller pieces either by chopping with an axe or panga, or by breaking it against their knees. Common accidents include cuts and wood splinters in hands, feet and eyes. Two injuries caused by splinters but unreported in interviews despite the consequences being clearly visible were a woman wearing a homemade eyepatch and another woman who had a partial leg amputation as a result of a splinter injury to her ankle which became infected. When asked why these injuries were not

mentioned during interviews, the response was "these things happen all the time", that is, they are a normal part of a woman's daily life—part of their lived experience.

Even when women do report issues, they appear not to be picked up by policymakers. A recurrent theme raised by the women in our study villages was that firewood collection is tiring and a cause of constant emotional and mental stress but this does not appear in the literature.

Insight 2: Shinning a Light on Hidden, Cascading Health Impacts
Women talked of and were frequently observed using a range of analgesics to deal with musculoskeletal pains. Modern medicines, which have become more readily available in rural villages, are used simultaneously with and sometimes replace traditional soaks or rubs to ease body pains. In Cutwini's weekly clinic, it was observed that painkillers were supplied on request with little discussion on why they were needed or about the consequences of prolonged use. Methyl salicylate, a muscle rub, was the second most requested medication after cough medicine. Even if the clinic had refused to supply the painkillers, women could easily obtain additional supplies by either buying them or asking a friend. MNM was often asked if she could share a stronger pain killer "from abroad".

Insight 3: Exploring the Intersections Between Life Conditions, Life Stages and Firewood Collection
Here, we describe three health issues linked to firewood which are rarely discussed, if at all, in the literature but are well recognised by rural women.

Mass HIV testing came to Cutwini in 2008. The outcome of this testing was villagers' heightened awareness of the extent of the infection which led to more open public discussions about HIV, moving beyond using abstract terms of "HIV is dangerous" to more personal discussions of how HIV affects daily life. Six HIV-positive women reported that firewood collection had a negative impact on their health due to fatigue, which could weaken their already-compromised immune systems, or that they had anxiety while collecting firewood. Three women reported

having stopped collecting firewood because of their HIV diagnosis. One now cooked with LPG to protect her health.

Women reported incidents where they believed firewood collection, combined with their existing health conditions, resulted in negative effects. For example, one woman with oesophageal polyps and three women with tuberculosis reported vomiting blood after firewood collection. The nurses at the village clinic in Tsilitwa reported that a woman had died after vomiting blood during a firewood-collection trip. Several women also mentioned that when carrying firewood that they felt "their chests being compressed by heavy loads".

Six women, including one with a two-week-old baby, stated that they experienced lower uterine pain when collecting firewood while pregnant. Negative infant and maternal outcomes linked to carrying heavy loads during pregnancy have been reported in a few studies (Spinillo et al. 1995; Bonzini et al. 2007). However, these studies are not recent, are based on small samples and often the subjects are women in developed countries employed in "modern", less physically demanding, professions as opposed to manual work such as firewood collection. Nevertheless, it is not unreasonable to incorporate the findings from these studies to conclude that firewood collection while pregnant is likely to have negative outcomes for the mother and/or child.

Insight 4: Perceiving Experiences of Firewood Cooking and Contradictions in Practice

The most common self-reported health issues linked to cooking with firewood are eye problems followed by respiratory problems (Table 3.4). This contrasts with the literature where we find extensive coverage of HAP and respiratory problems but less on the impacts of HAP on ocular health. The studies that do exist tend to be more than ten years old and from India and Nepal (see, e.g., Badrinath et al. 1996; Pokhrel et al. 2013; Saha et al. 2005).

There seemed to be, at least in our villages, some confusion regarding the effects of firewood smoke on health. Women with TB reported fears that smoke from cooking worsened their condition. On the other hand, pregnant women and women with infants seemed unconcerned about the health impacts of smoke on the unborn or new-born babies. This

Table 3.4 Self-reported experiences of cooking with firewood use in Cutwini and Tsilitwa

Impact reported	Cutwini n = 69[a]	Tsilitwa n = 83[a]
Pain in the eyes	37	21
Makes me breathless	13	20
Headache	13	6
Makes me cough	10	18
It's there but not a problem/don't care	9	7
Hurts child's eyes	6	3
Affects child's chests	5	1
Afraid that it will make my TB worse	4[b]	2

Source: Matinga (2010: p. 177)

[a]This excludes those that do not use firewood at all and those, in Cutwini, that barely used firewood. However, the results are derived from what was mentioned in their narratives not from options presented to them

[b]While these answers were women's answers because men often go out during cooking although they are present when chatting around a fireplace especially in the evening

suggests that the villagers have an interpretation of HAP which is not in line with medical research, which points to the link between HAP and poor maternal outcomes such as low birth weight (Boy et al. 2002; Siddiqui et al. 2008). This difference in understanding is not helped by nurses and doctors in the local clinics who appear not to recognise the health issues of smoke from wood fires (an issue we return to below) and as a consequence do not warn mothers about the dangers of HAP.

Although kitchens often had permanent ventilation (holes in the walls), these were almost always blocked with materials such as hessian sacks or old rags, thereby preventing airflow and opportunities to reduce smoke levels in the kitchen. The explanation given for stopping air inflow was that "cold air causes coughs". This statement contradicts the most common response to dealing with the effects of smoke, "opening windows" (Table 3.5), suggesting that the women sometimes simply give the desirable answers.

In accordance with traditional beliefs, newly delivered women and their babies spent 7–10 days indoors with a fire burning constantly to keep them warm and ward off "bad wind" (ill-will). Even after this period,

Table 3.5 Self-reported ways of addressing smoke from cooking

Response	Cutwini n = 69	Tsilitwa n = 83
Open windows	15	22
Air channelling	11	2
Goes out	10	12
Nothing	7	8
Takes headache pills	7	4
Its culture/I'm Xhosa/I like Xhosa fire	7	3
Seeks medication (clinic, buys, traditional)	5	1
We are used to it/we persevere	5	10
Takes fire out	4	2
Do nothing because children cannot close eyes	2	0

Source: Matinga (2010: p. 178)

infants spend a lot of time in the kitchen, with a burning fire to keep them warm, while allowing their mothers to undertake other care work such as cooking. Other traditional beliefs linked to the fire include that treating respiratory infections requires one to stay by the fire (in a smoky atmosphere) to keep warm. Although households with sufficient surplus income or sufficient time to spend at clinics turn to Western medicine for treatment for respiratory problems (as can be seen above—cough medicine is the most requested medicine at the clinics), all households also use herbal remedies.

It is not only villagers that have a very limited awareness of HAP and health issues but that this also seems to be the case among health professionals in clinics (Matinga 2010; Matinga et al. 2013). The rural healthcare system does not adequately serve villagers and encourage them to seek treatment. In our villages, those wanting treatment could face a lengthy wait to see a healthcare professional (30–60 min was not unusual in Tsilitwa) and Cutwini residents face a four-hour round trip plus a wait for a consultation at a free, but oversubscribed, government hospital.

Insight 5: A Window into Internalisation, Cultural Logics and Obscured Effects

We would argue that village people's apparent limited concern and lack of response to the effects of firewood collection and use is not only due to a lack of familiarity with the findings of Western science. Firewood use is

an age-old practice and the associated health effects, such as chronic musculoskeletal pains, respiratory illnesses and eye irritations, are considered a normal part of daily life. Women report that it is *normal* for children to have respiratory infections. One respondent said "It is the child without *ubiyane* [thick yellow phlegm] who must be taken to the doctor". Villagers normalise and use cultural logics to understand and rationalise the causes of respiratory infections, such as that they are caused by skipping rituals during and after pregnancy, children playing with dust or eating sweet things.

The socio-political history of South Africa, including its racial aspects, also plays a part in people's understanding, normalisation and explanations of their experiences. Narratives of "natural strength" are part of the affirmation of Xhosa and black identity. Such narratives were often presented to justify why "these things [i.e. smoke or firewood collection] don't affect us". It was not unusual to hear remarks such as "we are strong" or "we are used to it, unlike you [i.e. MNM] or unlike white people". We believe that this worldview contributes to an under-reporting of health issues.

The normalisation of health effects from firewood collection and use is not confined to villagers but also exists among local health personnel. Four out of ten nurses interviewed recalled women reporting musculoskeletal pain and injuries resulting from collecting firewood. Four out of nine health personnel[7] reported that they did not address the effects of firewood collection because they did not see them as health issues—injuries as a result of firewood collection are "just part of women's work". Health and firewood were not part of their training or professional discourse. This was even true for a programme manager with a degree in Occupational Health who was responsible for the occupational and chronic diseases programme. Three programme managers even reported that they saw firewood collection as beneficial exercise for pregnant women and encouraged it as part of health promotion.

[7] Health personnel are managers of health programmes. They have a professional nursing qualification.

Five of ten health personnel reported that they did not address effects of smoke because it does not cause problems or is part of daily experience. One reported that:

> in our culture, a woman is supposed to be doing these things, collecting wood, cooking, collecting water, plastering houses. When you complain, then they will laugh at you. It's because you are lazy. Even for us, if our daughter says 'What! What! Collecting firewood' I just ignore her. I don't want her to grow up lazy.

Cultural logics and the gendered division of labour, which allocates firewood collection to women, also create for women a precious social space which they can be reluctant to relinquish in exchange for cooking with electricity. Women cited "friendship reasons" for continuing to collect firewood even after electrification (Matinga et al. 2013). Firewood collection trips often involve groups of women of different ages and relationships, which offers opportunities for socialisation and for passing on life's values.

Discussion

Access to affordable, reliable, sustainable and modern energy for all (SDG 7) is seen as a critical goal in itself. Furthermore, there is a requirement for each SDG to be mutually reinforcing in achieving the other SDGs. As such, SDG 7 should contribute to reaching SDG 3 on health. The corollary is that health issues within SDG 3, in which clean modern energy could play a part in achieving the goals, can be used as arguments for promoting the use of clean energy. Yet, how best to address the lack of modern energy services and ensure a transition to modern energy and promote good health and wellbeing is often illusive, and designing policy to achieve this is challenging. In this chapter, we have shown that, at least in our two case study villages, despite recent policy-driven efforts in South Africa to deliver universal access to modern energy (part of SDG 7), access does not necessarily lead to the replacement of traditional biomass energy. Continued use of firewood results in the health

objectives of the Energy Policy not being achieved. We agree that, in some cases, the two common explanations—the lack of availability of the alternatives (electricity and LPG) and their cost—are factors. However, as we have demonstrated in the five insights into firewood use in our two villages, there are other factors that influence the continued use of firewood, and these are not reflected in policies and strategies in both the energy and health sectors.

We would argue that an overreliance on rapid qualitative data gathering methods to understand behaviour towards fuel use, and what motivates fuel switching, results in only a limited understanding of the reality of rural women and men's lives. Our data, which were gathered using ethnographic methods, provide insights that go beyond energy availability and cost.

The use of grounded theory ethnography allows new data and analytical categories to emerge at a rate determined by villagers as opposed to ones predetermined before the fieldwork starts. An example of an insight that emerged is that there are a range of health impacts, both physical and psychological, that result from firewood collection rather than from its use that are concerns for women carrying the wood. However, if the literature had been used to guide the research, it is the effects of HAP arising from wood combustion that would have been the main focus with scant attention given to health issues related to collection.

We have drawn attention to a probable under-reporting of injuries and illnesses which are linked to firewood collection and use because they occur so frequently that they are considered part of everyday life. This trivialisation of health impacts by both villagers and health professionals can have serious consequences. We mentioned the woman whose splinter in the ankle from chopping wood led to a partial leg amputation. Other concerns include long-term indiscriminate use of painkillers to address musculoskeletal impacts from carrying firewood. While, as outsiders, we can well imagine that carrying heavy loads has physical consequences for the body, the mental stress from firewood collection is less tangible. These findings emerged because of another aspect of ethnographic methods: long engagement by the researcher in village life. Such an approach allows for observation which, for example, can identify contradictions between responses given in interview settings and what is observed to occur in

practice. Long engagement also allows time to build trust with respondents. This enables more personal feelings to be described, for example the impact of being HIV+ on firewood collection and use. Women are also then able to describe health issues not in the language of Western medicine but in their vernacular, which has helped us to show how perception informs and influences choices related to energy. Allowing women and men to be involved in ways that are more familiar to them enables them to be active participants in, and shape directions of, the research rather than being treated as passive subjects of studies. Such methods give voice to people who are often not heard but when listened to can point the way towards effective interventions. An example from Philippines shows that when grassroots health workers conducted their own analyses of health issues, they produced data at variance with official statistics which they used to identify priority actions that led, in a matter of months, to a sharp decrease in mortality (Nierras 2002 cited in Chambers and Mayoux 2003). In our case, by leaving the research open to new themes, the participants' narratives of their experiences shaped the directions and key themes of the research.

Our results have shown a near-complete lack of awareness by both household members and local health workers of the severity of the consequences for health from the impacts of firewood collection and use. It appears, at least in the area of the Eastern Cape where we conducted our research, that there is a failure of the knowledge related to HAP's effect on health to make its way along the medical chain to the healthcare workers who are at the daily interface with the villagers. If healthcare workers do not have the knowledge to inform villagers about the consequences of exposure to HAP, villagers will not have the knowledge that could provide the motivation to switch to clean energy. That villagers do respond to new knowledge related to health can be seen from changes in attitudes to HIV when presented with the results of the testing in the villages. This disconnect between the knowledge generated within formal medical or energy circles and those outside those circles who could use that knowledge to make informed responses to health issues raises questions of who decides the research agenda, its priorities and to what ends?

Nevertheless, given the cultural importance of firewood collection and the fireplace, and the many problems that assail such communities,

knowledge about HAP and its health impacts might not be a sufficient motivation for abandoning firewood. HAP is an issue prioritised by the scientific community but, as our insights from the field show, it is not necessarily seen as a problem by women, and even as part of a solution. For example, warmth and smoke from a wood fire in the kitchen are, from the cultural perspective of our villages, seen as a solution to colds and as the place where an infant starts life. Other health issues, particularly HIV but also muscular skeletal problems from carrying firewood, take precedence over smoke inhalation. This is at odds with the literature where musculoskeletal problems from carrying firewood are largely unrecognised and under-researched. This lack of recognition by the scientific community has additional negative consequences when long-term self-administration of analgesics becomes accepted practice.

Conclusions

In this chapter, we have provided insights into the energy transition in a context where the energy policy contained socially oriented objectives in line with the SDGs. However, these policies are not yielding optimal results in respect of positive health outcomes even in respect of an energy policy which has explicit health objectives. In searching for explanation, we argue that it is the methods used to formulate policy which underlie the policy outcomes. Quantitative research is often used to demonstrate causality, and hence its outputs can be used to justify spending money on addressing a problem. As we have shown, the data provided by quantitative research are not always in line with how rural people perceive an issue. What to an outsider might be identified as a problem, for example HAP, can to the villager just be part of everyday experience—even part of a solution to a problem. Without understanding issues from rural people's perspective, interventions will not reach their objective.

We are not opposed to quantitative research, but we consider that it is limited when wanting to understand and possibly change behaviour. The energy-health-gender nexus is embedded in complex social-cultural and economic interactions which are shaped by the users' context, practices and beliefs. Explanations about behaviour, for example the continued use

of firewood, are difficult to unpack through quantitative methods when explanations are beyond the quantifiable (such as cost and availability of alternative fuels) but can be understood through the use of qualitative methods and specifically ethnography. We have used ethnographic methods, which allows for long and embedded engagement, to reveal why people are reluctant to completely abandon firewood. We have also shown that there are a number of health issues around the use of firewood which were often considered mundane and rarely mentioned in formal interviews but emerge in the casual conversations of daily life, for example, the prolonged use of painkillers for relief of muscular pain from firewood collection.

It is an issue of concern that research findings related to HAP are not reaching down to the lower levels of the health care system in the rural areas of South Africa. It does appear that the international community is becoming aware of the need to upgrade knowledge at the interface between healthcare workers and their patients. The Global Alliance on Clean Cookstoves (GACC) is now promoting the incorporation of at least IAP and its health effects into medical research, curricula and clinical training programmes starting with a training programme of health care professionals (GACC 2016). In the reverse direction, the health effects of firewood collection are not catching the attention of researchers and policymakers. In part, because rural health personnel do not see the injuries as health issues—they are "just part of women's work". We also consider the underreporting of injuries because they are considered part of everyday life contributes to the lack of understanding of the consequences of neglect leading to a failure to inform and act.

We believe that the use of ethnography can inform policy by complementing quantitative and modelling methods. Ethnographic methods can reduce the tendency to be technocratic, as well as revealing hidden motivations and contradictions and so better respond to lived realities. Such methods also allow the intended beneficiaries of interventions, who are often not heard, to contribute to identifying their own health problems and pointing the way towards effective interventions.

We accept that ethnography, like any research method, is not without its problems nor that it can provide all the answers. Indeed ethnographers should continually question their positionality in such contexts, and long

engagement can lead to emotional attachments that must be addressed throughout and when the research is over. In this sense, the framework by Pacheco-Vega and Parizeau (2018), "doubly-engaged ethnography" framework can be useful in this context in that it seeks to protect and give a voice to marginalised individuals and groups. For informing policy, doubly engaged ethnography should not only give voice to marginalised individuals and groups but also reduce the tendency to dismiss perceptions and beliefs of these groups as primitive. This approach therefore seeks not to overlook the views of intended beneficiaries but to accommodate them in policy. We argue that the dismissal of perceptions of policy target groups when they do not fit in objectivist frames heavily contributes to policy failure. We therefore challenge policymakers to design policy for and with rather than against cultural lenses through which everyday experiences are interpreted and acted upon.

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