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Fuelling Poverty

The challenges of accessing
energy among urban households
in Juba, South Sudan



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Cover image: A man prepares charcoal for sale at the main charcoal market in the Konyokonyo area of South Sudan's capital Juba June 21, 2013. © REUTERS/Andreea Campeanu.

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Summary

Access to energy is crucial for survival, recovery and resilience in the extremely challenging context of economic crisis, conflict and climate change with which South Sudan is confronted. Cooking fuel in particular is as critical as food for daily survival in the impoverished urban context of the South Sudanese capital, Juba. While global policies focus on enabling a positive energy transition from fossil fuels to renewable energy, residents of Juba emphasize their recent experiences of deteriorating access to energy for their daily household needs, in terms of both the quantity and types of energy source they could afford.

The rising cost of fuel since 2013, when the recent South Sudan civil conflict began, has had an environmentally positive effect on some better off households in prompting a shift from diesel generators to solar power. For the majority of urban residents, however, economic decline and security constraints have forced a shift down the ladder of energy preferences, from solar or generator, to charcoal and wood. For the poorest residents, this has been a change from charcoal to wood, grass or combustible waste.

Woodfuels are potentially renewable sources of energy. In rural areas, they generally have provided an accessible and freely available source of fuel, albeit with (usually women's) labour costs and risks. In an urban context with considerable insecurity in the surrounding areas, however, woodfuels have become largely marketized and costly. The use of wood or plastics as cooking fuel also has implications for health and the natural environment.

The changing energy economy has potential implications in terms of conflict. Recent rapid urbanization and displacement, combined with the legacies and continuities of a war economy, are undermining any existing regulation of forest resources and making the demand for household energy a source of actual or potential conflict in the rural areas surrounding cities and towns in South Sudan. While there is no lack of awareness among Juba residents about the environmental impacts of deforestation and pollution, these concerns are situated within the challenges of the particular political economy of energy that has grown out of war, urbanization and economic crisis.

The charcoal trade in particular is a new development rather than a continuation of traditional practices. The trade has expanded massively to meet the needs of urban and displaced populations, and relies on new transport and communication technologies and security arrangements. Women and smaller-scale producers and traders have increasingly been driven out of the charcoal market because of the risks and costs of transporting charcoal and wood from outside the city. Nonetheless, women are still largely seen as responsible for obtaining cooking fuel for their households, placing them at the sharp end of this changing energy economy.

For women in South Sudan, the multiple threats and hardships of life are crystallized in the daily struggle to find fuel, either by taking the risk of collecting firewood themselves or, increasingly, by paying the high prices at city markets for charcoal and wood. They understand all too well that these prices reflect not only wider hyperinflation but also the particular context of war and insecurity, which has created risky but lucrative opportunities for those with the resources to produce and transport charcoal in a militarized environment.

The challenges that women face to cook food for their families are not just an indication of general poverty and the lack of development of the energy infrastructure in South Sudan. These challenges need to be understood as a consequence of conflicts in the country that have driven displacement, contributed to urbanization, eroded customary rights, limited access to energy sources and created a militarized economy of unprecedented natural resource exploitation.

In this context, small-scale initiatives aimed at improving the fuel efficiency of cooking practices may offer some benefits but they alone will not be able to address the more fundamental political economy of energy in South Sudan. International agencies need to recognize their own position and responsibility in this energy economy, as well as support positive initiatives by government and national organizations to improve access to clean and reliable energy. Above all, more coordinated and joined-up approaches are needed, recognizing that energy is an issue cutting across multiple policy areas—from humanitarian needs, health and protection issues to security, conflict prevention and environmental protection.

1. Introduction

The South Sudan oil reserves played a crucial role in both the conflicts and peace processes that led to its emergence as an independent state in 2011. As the source of the overwhelming majority of the South Sudan national budget—in 2011, oil revenues stood at 98 per cent¹ of the total state revenue—stoppages or price changes in the oil sector have had fundamental consequences for the national economy, and therefore affected the capacity of the South Sudanese population to afford a range of domestic fuels.²

The obvious importance of fossil fuels for the macro political economy, however, has led to the neglect of the more mundane energy needs of the population, almost all of whom are reliant primarily on fuelwood and charcoal. Energy requirements are often absent from humanitarian assessments of basic needs, where the focus is on food, water and shelter.³ Yet the need for cooking fuel, in particular, is just as essential to life and health as these other necessities, while access to electricity is fundamental to education, health and other services, as well as to the basic functioning of government institutions and businesses.

The negative environmental consequences of widespread use of wood as fuel and in charcoal production—namely, deforestation—are increasingly gaining attention and concern, including among populations who rely on these fuels for daily life. Without a more complete understanding of the rapidly changing energy economy, however, efforts to address the environmental consequences of these shifts are unlikely to be successful.

This report builds on a growing body of research on the South Sudan energy economy and its environmental implications, including important work by The Sudd Institute, UN Environment Programme and others, which have employed a range of methods to survey energy use, analyse value chains and measure impacts on forest cover using satellite remote sensing.⁴ Yet the perspectives and experiences of the energy users at

1 UN Environment Programme (UNEP), South Sudan: First State of Environment and Outlook Report, Nairobi: UNEP, May 2018, 226.

2 Nhial Tiitmamer and Jok Gai Anai. 'Transitioning to Renewable Energy: An Analysis of Energy Situation in Juba, South Sudan', Juba: The Sudd Institute, 28 September 2018, 6–7.

3 United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), '2018 Humanitarian needs overview: South Sudan', New York/Geneva: UN OCHA, 5 December 2017. This overview only mentions firewood needs briefly in relation to women's security, and does not include fuel or energy in the most vital non-food needs. Likewise, the UN World Food Programme (WFP) monthly market price monitoring includes food items and petrol/diesel but not charcoal. For more information, see: 'The Market Monitor', WFP. Accessed 2 September 2020, <https://www.wfp.org/publications/market-monitor>.

4 Tiitmamer and Anai, 'Transitioning to Renewable Energy'; UNEP, 'South Sudan'; Bryan Adkins, Charcoal Production and Use in South Sudan: A Wildlife Conservation Society (WCS) South Sudan Action Plan for Mitigating Environmental Impacts, Juba: United States Agency for International Development/WCS, 2018.

the end of these value chains are not often considered in analysis of broader environmental and economic patterns. This report tries to address this.

The research for this report posed a number of questions related to the South Sudanese energy economy. How have ordinary people living in Juba experienced the changing energy economy over their lifetimes and through displacement and migration? What are their preferences, priorities, options and strategies for managing their household energy needs? What challenges and risks does this entail, and how do they understand and mitigate these, collectively or individually? What are their views on the environmental effects of the energy economy? How do they analyse the constraints and opportunities of improving energy access and its effects?

The principal research questions set out above were addressed through 45 qualitative semi-structured interviews and focus group discussions conducted by a team of researchers in 2018–2019 in several of the poorer neighbourhoods in Juba (primarily Shirikat, Nyakuran South and Gudele). The research did not involve large-scale quantitative methods but instead sought to access the detailed views and experiences of ordinary people in Juba, who are not usually consulted regarding their energy needs, opinions and concerns.

Researchers selected respondents through a combination of informal random selection and their willingness to discuss the issues in some depth. Several charcoal traders were also interviewed to learn more about their trade. Security concerns and the urban focus of the research meant that interviews were not conducted in the rural areas where charcoal is produced, although this would be an important area for further research.

Female respondents were prioritized—46 out of a total of 65 respondents were women—since women are generally considered to be responsible for obtaining cooking fuel. The voices of female respondents are given prominence in order to convey the daily challenges they face in accessing energy and to encourage deeper research and consideration of the issues they raise.

2. Fuel in crisis

The energy economy in Juba has been shaped by the particular pressures of rapid urban growth since 2005 and economic crisis and conflict since 2013, as well as by the longer history of limited infrastructural development in the country. Even before the outbreak of conflict in 2013, South Sudan had the lowest electricity consumption per capita in the world.⁵ In 2015, final consumption of electricity was 16 ktoe (kilotonne of oil equivalent) and total electricity generated was 28 ktoe.⁶ The diesel-fuelled power station in Juba, with a limited city grid, has functioned only sporadically since 2012 due to both the high cost of fuel and technical faults. A new diesel-powered plant funded by the African Development Bank (AfDB) was recently constructed by Ezra Power, promising to reach at least 20,000 domestic and commercial consumers by 2021. This is, however, only a small proportion of the population in Juba—generally estimated to be at least 400,000—and the tariff of around USD 0.31–0.40 per kilowatt-hour will be beyond the means of most households.⁷ This leaves the majority of the population in Juba relying on other sources of energy—from diesel generators, gas and solar panels, to charcoal and fuelwood—to power their daily lives. For almost all Juba residents, especially those who are the poorest, the economic hardships and heightened insecurity of recent years have forced a decline in the amount and type of energy they can access.

A changing energy landscape

Diesel generators are the main source of electricity in Juba but generally they are only accessible to the government offices, agencies, businesses and the few wealthier individuals who can afford the purchase and fuel costs. Beyond this small group, the city population has remained almost entirely dependent on biomass (wood, charcoal and grass) for cooking and heating water, with a preference for charcoal. Already in 2009, charcoal was being used as the main cooking fuel by 54 per cent of urban households

⁵ David Mozersky and Daniel M Kammen, 'South Sudan's Renewable Energy Potential: A Building Block for Peace', Special Report, Washington, DC: United States Institute for Peace, 2018, 2.

⁶ UNEP, 'South Sudan', 226.

⁷ Tiitmamer and Anai, 'Transitioning to Renewable Energy', 7–11 (and personal correspondence with Nhial Tiitmamer); Mozersky and Kammen, 'South Sudan's Renewable', 7; Hellen Toby, 'Energy-short South Sudan powers up - but with fossil fuels', *Reuters*, 26 Nov 2019. Accessed 14 August 2020, <https://www.reuters.com/article/us-southsudan-energy-climate-change/energy-short-south-sudan-powers-up-but-with-fossil-fuels-idUSKBN1Y01P0>; Maria Gallucci, 'South Sudan Is Building Its Electric Grid Virtually From Scratch', *IEEE Spectrum*, 13 March 2020. Accessed 14 August 2020, <https://spectrum.ieee.org/energywise/energy/policy/south-sudan-rebuilding-grid-from-scratch>; ESI Africa, "'City of darkness' no longer—AfDB supported electricity project lights up Juba', 25 May 2020. Accessed 14 August 2020, <https://www.esi-africa.com/industry-sectors/transmission-and-distribution/city-of-darkness-no-longer-afdb-supported-electricity-project-lights-up-juba/>.

in South Sudan, compared to only 2 per cent of households in rural areas, where wood was the main fuel.⁸

Some people have experienced other energy sources, such as liquefied gas, in cities or refugee settlements to which they migrated or were displaced during previous periods of conflict. Even if it was affordable, liquefied gas is often seen as a more dangerous fuel than biomass due to its capacity to cause fires and burns.⁹ Solar energy devices have been taken up more widely, especially for lighting and charging phones, whether purchased by those who could afford them during the relative boom years after 2005, or obtained in refugee or internally displaced person (IDP) settlements. The limited battery capacity and frequent breakdown or loss of components, however, appear to limit their use, as a woman in an IDP settlement in Juba explains: ‘There were solar lamps which were distributed to us in 2015. Now, they are finished and are not working’.¹⁰

The most significant factor in changing the energy landscape of South Sudan has been the rapid urbanization that has taken place since the 2005 Comprehensive Peace Agreement, which officially ended the conflict between the Sudan People’s Liberation Army (SPLA) and the Sudanese government in Khartoum. Despite the scale of and speed at which urban energy needs have developed, this issue receives relatively little attention from government or international agencies. In many other African countries, urbanization since the mid-twentieth century has generated unprecedented demand for charcoal, as well as for other energy sources, creating new energy markets, supply chains and often powerful vested interests, with varying degrees of attempted regulation.¹¹ South Sudan has experienced these developments in a compressed period of particularly rapid urbanization, amid the added challenges of conflict and economic desperation. Juba has expanded rapidly, putting direct access to wooded areas beyond the reach of many urban residents, particularly as the immediate surroundings have been rapidly deforested. Charcoal is a more convenient fuel for urban markets, being easier (for both vendors and consumers) to transport and store than wood, which is bulkier.

In rural areas across the country, wood is used much more commonly as a fuel than charcoal, especially by poorer people, because it can be collected nearby without having to pay market costs. One woman recalled the rural home she left in 2017: ‘In Panyagor, the fuel is everywhere: you don’t even need to stock the wood in your house because you

8 National Bureau of Statistics of South Sudan, ‘National Baseline Household Survey 2009 Report’, as referenced in UNEP, ‘South Sudan’, 235.

9 Interview with a married man, Nyokuran South, 29 May 2018; interview with a married woman, Nyokuran South, 30 May 2018; and interview with a male charcoal trader, Suk Libya, 24 March 2019. Also see: UNEP, *Charcoal and Fuelwood Consumption in Juba and the Associated Impacts on Forests*, Nairobi: UNEP, 2015, 18.

10 Focus group discussion with female IDPs, Konyokonyo. The same point was made in an interview with a middle-aged male engineer, Gudele, 27 May 2018; interview with a married man, Nyokuran South, 29 May 2018.

11 Ruth Mendum and Mary Njenga, ‘Integrating wood fuels into agriculture and food security agendas and research in sub-Saharan Africa’, *FACETS* 3, 2018, 1-11.

can get it from a nearby forest'.¹² In the city, however, many people express a preference for cooking with charcoal rather than wood because charcoal is less smoky and sooty, and can be left to burn for longer before being replenished. One woman explained that she only ever used charcoal because 'the smoke from wood affects my eyes and I don't like it'.¹³ Such experiences are supported by research on the health effects of burning wood and charcoal.¹⁴

There is also a sense that charcoal represents a modern way of cooking, more appropriate for urban life and the identity of women living in the city—the identity and lives of whom are increasingly different from those who live in rural parts of South Sudan. As one woman explains, 'I'm in the city. I want fuel that can keep my cooking pans shining'.¹⁵

Despite this preference, many people report that they now rely on wood (or grass and scrap combustible materials, such as plastic) rather than charcoal because the latter is more expensive and only available from the market.¹⁶ In August 2020, a bag of charcoal in Juba cost about SSP 3,000, which is about USD 8 at the current rate of SSP 375 to USD 1; this bag lasts four to six days, depending on a household size and the type of stove used.¹⁷

Energy access is often a marker of the relative economic status (and political connections) of urban residents. In general, electricity and gas are seen as privileged resources, as one female household head emphasizes: 'Well, electricity is not with many people and the one you are talking to is not a type of person that can get electricity. ... As you can see, this place has no opportunities that can enable people to achieve such things'.¹⁸ Another women living in the same area explains, 'If you have money, it is better you

¹² Interview with a widow, Shirikat, 20 May 2018.

¹³ Interview with a married woman, Shirikat, 13 May 2018. Other women also complained of woodsmoke affecting their eyes. For example, interview with a married women, Shirikat, 18 May 2018; interview with a widow and a married woman, Shirikat, 18 May 2018.

¹⁴ Gasim Omer Elkhailifa Abd-Elfaraga and Charles O.C. Langoya, 'Household air pollution and childhood pneumonia in South Sudan: will clean cooking stoves reduce the incidence and mortality?', *South Sudan Medical Journal* 9:2, 2016, 36-39.

¹⁵ Interview with a married woman, Shirikat, 21 May 2018; interview with a middle-aged married woman, Shirikat, 5 May 2018; interview with three married women, Shirikat, 6 May 2018; interview with a middle-aged married woman, Shirikat, 9 May 2018; interview with a middle-aged woman (female-headed household), Shirikat, 11 May 2018; interview with three women, Shirikat, 12 May 2018, interview with seven middle-aged men, Shirikat, 27 May 2018; interview with a retired married man, Nyokuran South, 2 June 2018.

¹⁶ Interview with a married woman, Nyokuran South, 30 May 2018. Sixteen of 46 female respondents report relying primarily on wood most or all of the time. IDPs in Shirikat are reported to use only wood, according to interview with female and male IDP camp leaders, Shirikat, March 2019.

¹⁷ The author is grateful to Nhial Tiitmamer for these updated figures in August 2020.

¹⁸ Interview with a middle-aged woman (female-headed household), Shirikat, 21 April 2018.

eat than buy electricity.¹⁹ A third woman comments that while ‘there is electricity for commercial use, people like us who have no money cannot access it’.²⁰

The major use of electricity that people usually express a need for is lighting so that their children can study in the evenings.²¹ Most also mention phone charging. The use of electricity for refrigeration or to power devices such as televisions is seen as such a luxury that it is more often aspired to as an opportunity to generate income through having a shop or video hall, or charging for access to the power, rather than purely for domestic comfort.²² Regardless of their relative economic status, none of the people who were interviewed feel that they have sufficient access to energy to meet all of their needs.

Along with urbanization, the dire economic situation of the country has severely affected the type and amount of energy that Juba inhabitants can afford. All participants interviewed for this study tell a negative story of declining access to energy over the past decade. Some recall life in rural areas with plentiful and safer access to fuelwood.²³ Others look back longingly on their previous experiences in other cities or refugee settlements with better energy infrastructure.²⁴ Many have even quite recently experienced a time in Juba when they could afford to use gas, diesel generators or solar power.²⁵ At the lowest income levels, this has meant a transition from charcoal to wood, while better off people report shifting from gas, solar power or generators to charcoal and increasing use of wood.²⁶

Insecurity and energy access

The economic decline in South Sudan has been worsened by growing insecurity, violence and crime, which has especially affected use of solar panels. Some people report buying solar panels during better times but, having had them stolen, are no longer able to afford or risk replacing them.²⁷ Even wood is sometimes stolen from houses, as one woman explains: ‘My wood was stolen yesterday and that is why you see me sitting like this,

¹⁹ Interview with a married woman, Shirikat, 7 May 2018.

²⁰ Interview with a middle-aged widow (female-headed household), Shirikat, 5 May 2018.

²¹ This need was expressed in twelve separate interviews.

²² Interview with a middle-aged married woman, Shirikat, 5 May 2018; interview with four women, Shirikat, 8 May 2018; interview with a middle-aged woman (female-headed household), Shirikat, 11 May 2018; interview with a married woman, Shirikat, 21 May 2018.

²³ Interview with a middle-aged married woman, Shirikat, 5 May 2018.

²⁴ For example, refugee settlements in Khartoum, Malakal and Kakuma; interview with a married woman, Hai Kuwait, 18 March 2019; interview with two married women, Shirikat, 20 April 2018; interview with a middle-aged woman (female-headed household), Shirikat, 11 May 2018; interview with a married woman in Shirikat, 13 May 2018.

²⁵ Interview with a married woman, Shirikat, 13 May 2018; interview with seven middle-aged men, Shirikat, 27 May 2018.

²⁶ Interview with a married woman, Hai Kuwait, 18 March 2019; also see: Tiitmamer and Anai, ‘Transitioning to Renewable Energy’.

²⁷ Interview with female and male IDP camp leaders, Shirikat, March 2019.

with the stress. I have not eaten today because there is nothing to cook with.’²⁸ Insecurity thus reinforces the reliance on charcoal, which can be purchased and stored in smaller quantities inside houses.²⁹ Conflict and violent crime on the roads outside Juba have also prevented most people from accessing cheaper sources of wood and charcoal in the nearby villages and towns, as some used to do.³⁰

People therefore understand their energy needs as part of a broader sense of deterioration in their security and well-being, and that of their country. One woman emphasizes this in comparing her current life in the Juba Protection of Civilians site (PoC) with her former life in the town of Malakal: ‘People no longer cooperate and respect each other, unlike before. And because our country is in crisis, you find it is most difficult to find fuel, like firewood and charcoal.’³¹

Since late 2013, the South Sudanese civil war has generated massive displacement, both internally, including to UN PoCs, and to neighbouring countries. This further concentration and confinement of populations has exacerbated the challenge of meeting energy needs. The demand for fuelwood among refugees in northern Uganda is reported as a major threat to the environment and the main cause of tension and potential conflict with host communities.³² These are familiar challenges in refugee settings, where supporting organizations often have considerable experience of seeking to ameliorate energy needs, from fuelwood tree planting schemes to the provision of solar technology and fuel-efficient stoves.³³ Nevertheless, the scale of displacement requires much more extensive and effective intervention to mitigate the environmental effects and conflict risks of massive refugee settlements.

Less attention has been paid to urban energy needs, despite the fact that these replicate many of the same challenges faced in refugee or IDP settlements. The conflict and insecurity around Juba in recent years has effectively confined most urban residents within the city limits and made them almost entirely dependent on markets for their fuel or other energy needs.³⁴ One woman explains:

²⁸ Interview with a widow and a married woman, Shirikat 18 May 2018; interview with a widow, Shirikat, 20 May 2018.

²⁹ Interview with a middle-aged woman (female-headed household), Shirikat, 11 May 2018.

³⁰ Interview with a married woman, Gudele, 6 June 2018.

³¹ Interview with a female PoC resident, Hai Kuwait, 31 March 2019.

³² FAO and UNHCR, ‘Rapid woodfuel assessment: 2017 baseline for the Bidibidi settlement, Uganda’, 2018. Similar challenges are reported regarding Sudanese refugee settlements in South Sudan. See: ACTED, ‘Yida Deforestation Report’, Paris: ACTED, 2012.

³³ FAO, ‘Guidance Note: Meeting fuel and energy needs in protracted crises—the SAFE approach’, Rome: FAO, 2016; FAO and UNHCR, ‘Managing forests in displacement settings: Guidance on the use of planted and natural forests to supply forest products and build resilience in displaced and host communities’, Rome: FAO, 2018; Wycliffe Nabutola Musungu, ‘Fuel Efficient Stoves: Field Testing and Assessment of Local Production in the Bentiu Protection of Civilians Site, South Sudan’, Geneva: International Organization for Migration, 2017.

³⁴ On the broader increasing market dependence, see: Edward Thomas, ‘Moving Towards Markets: Cash, Commodification and Conflict in South Sudan’, London: Rift Valley Institute, June 2019.

[Where I lived before], you can walk to the forest and get your fuel without fear but here you can't move an inch to the forest because of the militias who attack people. But you use money to get anything you want. If you don't have money, you can't even get charcoal to cook.³⁵

The urban fuel demand, in turn, drives practices of wood extraction and charcoal production outside any indigenous mechanisms for regulation and the conservation of trees. This has obvious environmental consequences in terms of deforestation but it also has entailed the commercialization and securitization of the charcoal trade in particular, with implications for end users and stakeholders all along this value chain.

³⁵ Interview with a middle-aged married woman, Shirikat, 9 May 2018.

3. The expanding charcoal trade

Charcoal is often seen as a more traditional type of fuel than other energy commodities such as gas or solar power.³⁶ The charcoal trade supplying urban markets, particularly Juba, has seen rapid growth and innovation, however. It relies on transport infrastructure and mobile phone technology, often requiring considerable capital investment. Some of the transport business is reportedly owned by entrepreneurs from neighbouring countries, while South Sudanese military personnel are also widely reported to be involved in charcoal production and transport.³⁷ Soldiers and police have seen their salaries massively reduced in real terms by inflation, if they are paid at all. At the same time, the insecurity around Juba has deterred many civilians from the charcoal trade, leaving an obvious opportunity for those with the arms to protect themselves and their trading partners. This woman explains: 'It is only people who have means to protect themselves that usually go and get these fuels. And that is why most fuels are brought by military vehicles to the town.'³⁸

Unregulated charcoal production

The development of the charcoal trade, now heavily securitized, has seen a large-scale increase in production since 2014, with reports of more indiscriminate tree felling, including fruit trees protected under traditional practices.³⁹ Experience from elsewhere suggests that when non-local interests increasingly control charcoal production, the industry is likely to become more environmentally destructive in the area.⁴⁰ Even a South Sudanese charcoal trader in Juba points to this problem:

Foreigners are the ones ordering for cutting trees and bringing charcoal for wholesaling and they are the ones buying and selling to small businesses and individuals for consumption. So they don't pay attention whether that would have an impact on the environment because they are all after profit and they will always overlook the repercussions on the environment. ... And as South Sudanese, we don't benefit from that activity because most of its revenue goes abroad , and

³⁶ Adam Branch and Giuliano Martiniello, 'Charcoal power: the political violence of non-fossil fuel in Uganda', *Geoforum* 97 (2018), 242-252.

³⁷ Ayuen Panchol, 'Minister calls for safeguarding of "our forests"', *Eye Radio*, 22 March 2019. Accessed 14 August 2020, <https://eyeradio.org/minister-of-agriculture-calls-for-protection-of-forest/>; Adkins, 'Charcoal Production', 29; UNEP, 'South Sudan', 309. Many respondents, including charcoal traders, report the involvement of military personnel in the transport of charcoal, and sometimes in its production.

³⁸ Interview with a middle-aged married woman in Shirikat, 5 May 2018. This view is also supported by other respondents: interview with four women, Shirikat, 8 May 2018.

³⁹ Adkins, 'Charcoal Production'; UNEP, 'Charcoal and Fuelwood Consumption'.

⁴⁰ Branch and Martiniello, 'Charcoal power'.

both timber and charcoal are taken outside the country. I even heard of some being exported to Dubai.⁴¹

While this research focuses on urban energy needs rather than the charcoal production sites, there is clearly potential for disputes and conflicts over charcoal production in rural areas.⁴² According to one charcoal producer and seller, local authorities such as chiefs may be co-opted by charcoal traders to help avoid such conflicts, which may also ensure a degree of regulation; he goes on to indicate that trees in some areas are being protected, such as along streams and on hillsides, to try to limit environmental degradation.⁴³

Nevertheless, it is important to recognize that there are multiple vested interests in such a lucrative commodity, including the official or semi-official interests imposing various taxes on the movement and sale of charcoal—making reduction or regulation of its production even less feasible. A sack of charcoal can double or even triple in price between production areas and Juba markets.⁴⁴ Smaller traders then buy from larger ones and use motorbikes and mobile phones to deliver direct to customers (who can afford the transport costs) in their homes.⁴⁵

Rising costs, risky business

Monthly market price data compiled by government agencies and partners suggest that average charcoal prices in 2019 were more than 30 times higher than in 2015. This reflects the extreme hyperinflation over this period (peaking at 380 per cent in 2016), but firewood prices only increased by around 13 times and beans and maize by 11–12 times over the same period.⁴⁶ The rising costs of charcoal are explained by traders and consumers primarily in terms of the risks inherent in its production and transport. One woman describes how, ‘There are people who attack people in the forest or abduct people. And this explains why sometimes the people who bring the charcoal increase the prices of the fuel. ... Because they factored in the risks.’⁴⁷

Many people express understanding and even a degree of sympathy for those involved in the charcoal trade, ‘who have sacrificed to risk their lives by going to the forest and

⁴¹ Interview with a male charcoal trader, Suk Libya, 24 March 2019.

⁴² Also see: A Thulstrup and W J Henry, ‘Women’s Access to Wood Energy During Conflict and Displacement: Lessons from Yei County, South Sudan’, *Unasylva* 66 (2015).

⁴³ Interview with a male charcoal producer and seller near Juba, 1 March 2019.

⁴⁴ Interview with a male charcoal trader, Mia Saba, 24 February 2019.

⁴⁵ Interview with three women, Shirikat, 12 May 2018.

⁴⁶ ‘Monthly market prices’, CLiMIS South Sudan. Accessed 14 August 2020, <https://climis-southsudan.org/markets>.

⁴⁷ Interview with a married woman, Shirikat, 19 May 2018. Other respondents reinforce this point, e.g. interview with a married woman, Shirikat, 18 May 2018; interview with a married female civil servant, Shirikat, 21 May 2018.

getting these fuels',⁴⁸ as well as for the economic hardships that might drive ordinary soldiers receiving little or no salaries to this source of income. In turn, the few charcoal traders interviewed for this study express sympathy for the economic plight of their customers—especially those most in need such as elderly women—claiming that they allow some to buy on credit, buy extra quantities or receive free delivery.⁴⁹

Urban residents are heavily dependent on the charcoal supply chain, and even accept rising prices as an indication of the risks involved. While reports often focus on the effects of economic hardship in driving people into the production end of the charcoal supply chain, it is equally important to recognize the intense demand for charcoal among urban consumers. Any draconian attempts to halt or restrict charcoal production without alternative provision of cooking fuel would have major consequences for everyday food needs in the city, with women being most adversely affected by these changes.

⁴⁸ Interview with a middle-aged married woman, Shirikat, 5 May 2018; interview with three married women, Shirikat, 6 May 2018.

⁴⁹ Interview with two male charcoal traders, Suk Libya, 24 March 2019; interview with a middle-aged woman (female-headed household), Shirikat, 11 May 2018.

4. Women's struggle for fuel

One likely reason for the limited visibility of household energy needs in government or humanitarian policy priorities is the gendered allocation of responsibility for obtaining cooking fuel. In most of the households included in this study, the task of finding or buying fuel falls to women, sometimes with the help of older children. What is more, those interviewed for this study often emphasize that acquiring fuel is part of women's domestic and childcare duties. For example, one man clearly states, 'This is the work of a woman. My wife usually gets the fuel.'⁵⁰

Such traditions have been adapted to the urban marketized context, so that even if husbands or male relatives provide money for fuel, it is women who must do the purchasing. In an interview with four women, one of them says, 'The responsibility for getting fuel is for women. The husband brings the money and you go and get it from the market or wherever you will get it.'⁵¹ Another explains that, 'Sometimes if the man has no money, you look for other ways to get money to buy it [fuel]. You get fuel from means such as borrowing from friends, relatives and neighbours or even going out and looking for work.'⁵² These views are supported by women elsewhere in the city, as this woman says, 'I cannot fail to prepare something for my children because of no money to buy charcoal. I have to look for other ways, like using firewood.'⁵³

Energy poverty and insecurity

In rural or semi-urban areas, the labour costs of obtaining cooking fuel are absorbed into and go unnoticed as part of women's domestic work. There are also opportunities for women to gather more wood and grass than they need for their own households and to sell the surplus. Some women also recall going directly to charcoal production sites, for example near Bor, to collect the smaller pieces that could not be sold commercially, in return for helping the producers to sort out the larger pieces.⁵⁴

As charcoal has become a lucrative commodity in urban areas and as the risks of wood collection have increased, the profits of this urban energy economy increasingly have been monopolized by men. In 2015, for example, 86 per cent of charcoal traders and suppliers in Juba were men, with female traders and suppliers often conducting business

⁵⁰ Interview with a retired married man, Nyokuran South, 2 June 2018.

⁵¹ Interview with four women, Shirikat, 8 May 2018.

⁵² Interview with four women, Shirikat, 8 May 2018.

⁵³ Interview with a married woman, Gudele, 6 June 2018.

⁵⁴ Interview with a middle-aged widow (female-headed household), Shirikat, 5 May 2018; interview with three women, Shirikat, 12 May 2018.

at a much smaller scale.⁵⁵ The gendered nature of the charcoal trade is also apparent to our respondents: 'I am using firewood because it is much easier than charcoal, which is done by men.'⁵⁶

The deterioration in the security situation around Juba also has reduced women's independent capacity to use their own labour to obtain fuel, as this woman explains:

Before, women used to group themselves here in Shirikat and go to the forest to look for fuel, especially wood, but that stopped because of constant attacks in the forest by unknown people. So we ... turned to charcoal that is brought by these foreigners.⁵⁷

Another woman elaborates the loss of women's independence due to insecurity:

There is no freedom for everyone to go and look for the fuel for themselves... I am strong and I can go to the forest and get my charcoal or wood but I can't do that despite the fact that I'm able to because someone out there will attack me. So getting fuels has been left to the few people who can protect themselves and these people are the ones who bring the fuels and sell it to us at their prices of choice.⁵⁸

While insecurity has made charcoal production and transport generally more dangerous for civilians, the dangers of the forest are also seen to threaten women disproportionately.⁵⁹ As this woman asserts, 'Women are vulnerable and there have been cases where women who went to collect wood are raped in the forest.'⁶⁰

Women interviewed as part of this study clearly situate their energy poverty in the wider context of conflict and insecurity: 'We have to use firewood because charcoal is for people who have a stable home. But our place is not stable yet. Many conflicts are still keeping us from building our country.'⁶¹ Another woman explains, 'This is why women fear, because if you go to the bush you will not come back. Who will kill you? We don't know because we are all South Sudanese and the nation is deadly and not as good as before.'⁶²

Despite the dangers, the poorest and most vulnerable women, such as those in IDP settlements in Konyokonyo and Shirikat, report having no alternative to fuelwood collection. They therefore organize themselves into large groups to go and collect wood during the

⁵⁵ UNEP, 'Charcoal and Fuelwood Consumption', 6.

⁵⁶ Interview with a female PoC resident, Hai Kuwait, 31 March 2019.

⁵⁷ Interview with a married woman, Shirikat, 21 May 2018.

⁵⁸ Interview with a widow and married woman, Shirikat 18 May 2018.

⁵⁹ Interview with a middle-aged woman (female-headed household), Shirikat, 21 April 2018; interview with a married woman, Shirikat, 7 May 2018.

⁶⁰ Interview with a middle-aged woman (female-headed household), Shirikat, 11 May 2018.

⁶¹ Interview with a middle-aged married woman, Shirikat, 5 May 2018.

⁶² Focus group discussion with female IDPs, Konyokonyo, March 2019.

daytime. (They also sell some of this wood in order to purchase basic commodities such as soap and salt.)⁶³ Similarly in the UN PoC site, women go together in groups of up to 50:

What is forcing us to go to the forest to collect firewood is simply this situation of ours. Otherwise, nothing at all could impel us like that, because in the forest we find wild animals and snakes and the criminals holding guns. And because God is there for us, we just go and bring firewood for the sake of our children because South Sudan has put us in that dire need.⁶⁴

Women demonstrate considerable initiative in their strategies to find fuel. Several report collecting scrap wood locally when new buildings or fences are constructed or old ones dismantled: 'We always find ways of getting something to cook with because there is no way you can leave your children to stay without eating anything.'⁶⁵ Some also used fast burning grass in the dry season to make quick cooking *kisra* (paper thin sheets of bread).⁶⁶

Even without any external provision of fuel-efficient stoves, women are known to be careful and resourceful in their acquisition and use of fuel, as this single man explains:

Women do it much more professionally than we men do. Men will add more charcoal in order to cook quickly but women will do it more carefully. So the amount we usually use as men for only one day may keep a woman cooking for three consecutive days.⁶⁷

Women who struggle to purchase charcoal also believe they save on costs by buying small quantities that they themselves can carry from the market, rather than paying for transport.⁶⁸

Several respondents had constructed their own heat-conserving stoves for wood or charcoal, made from mud and brick plastered around a bicycle rim, known as a *buor* in Dinka.⁶⁹ They explain this as an economic decision, since the immobile nature of these stoves make them less convenient; however, rising charcoal prices necessitate their use. This woman elaborates:

⁶³ Interview with female and male IDP camp leaders, Shirikat, March 2019; interview with a widow, Shirikat, 20 May 2018.

⁶⁴ Interview with a female PoC resident, Hai Kuwait, 31 March 2019.

⁶⁵ Interview with two married women, Shirikat, 20 April 2018; interview with three married women, Shirikat, 6 May 2018; interview with a middle-aged married woman, Shirikat, 9 May 2018; focus group discussion with female IDPs, Konyokonyo, March 2019.

⁶⁶ Interview with a middle-aged woman (female-headed household), Shirikat, 21 April 2018; interview with a middle-aged widow (female-headed household), Shirikat, 5 May 2018.

⁶⁷ Interview with a male charcoal trader, Suk Libya, 24 March 2019.

⁶⁸ Interview with a middle-aged widow (female-headed household), Shirikat, 5 May 2018.

⁶⁹ Interview with a married woman, Shirikat, 7 May 2018; interview with four women, Shirikat, 8 May 2018.

A metal stove is also good because you can move it around. You can take it to your house, but you can't move a *buor* from one place to another. However, a *buor* cooks quicker than the metal stove. Simply, it produces more heat when the bricks and mud are hot, so you use less charcoal or wood.⁷⁰

Some women are also said to have brought fuel-efficient stoves back with them from the Kakuma refugee camp in Kenya, 'made of metal outside and strong clay soil inside'.⁷¹

Mutual support and outside assistance

In addition to these individual strategies to economize in obtaining and using fuel, women also cooperate and support one another, particularly when they live near relatives or in close relationships with their neighbours. The majority of women emphasize that they could turn to their neighbours for help if they completely run out of fuel, and that such help is offered on the basis of mutual reciprocity and shared hardship, rather than on a stricter understanding of debt. One woman sums up this way: 'It is a kind of relationship based on sharing fuel.'⁷² Another says, 'I have borrowed three times from my neighbours since I moved here in 2015. It is a relationship. Sometimes we call it borrowing but you are not required to pay back directly.'⁷³

A woman PoC resident echoes the same principles of mutual support, strengthened in the camp context by the need to collect firewood together:

Yes, we do cooperate. For example, if your feet are swollen because of walking and you rest for some days and your firewood is used up, then your neighbour could offer support. It's not necessary to refund her but she could give you firewood for free and one day she will take for free from you. ... We have women's gatherings in which we advise and encourage ourselves about how we should be strong in bringing up our children and when we are in the forest for collecting firewood, we emphasize our solidarity and unity. We can almost reach 50 women in number—holding one heart until we carry home our firewood.⁷⁴

Women also stress that such forms of cooperation are the only source of help with their fuel needs, as this respondent indicates: 'There is no community group and no one helps except your neighbours, with whom you have relationships.'⁷⁵ Another woman verifies this: 'If you need help, you go to your relatives or your good neighbour. That is what I

⁷⁰ Interview with a middle-aged woman (female-headed household), Shirikat, 11 May 2018; interview with three women, Shirikat, 12 May 2018; interview with a married woman, Shirikat, 18 May 2018; interview with a married female civil servant, Shirikat, 21 May 2018.

⁷¹ Interview with seven middle-aged men, Shirikat, 27 May 2018.

⁷² Interview with three married women, Shirikat, 6 May 2018.

⁷³ Interview with a married woman, Shirikat, 19 May 2018; interview with three women, Shirikat, 12 May 2018.

⁷⁴ Interview with a female PoC resident, Hai Kuwait, 31 March 2019.

⁷⁵ Interview with a married woman, Shirikat, 7 May 2018.

know. There is no community group.⁷⁶ Indeed the notion of a community organization is associated more with political elites, who might form ethnic associations or a specific NGO-supported initiative, as this respondent says: 'There are no community groups [here in Shirikat] because those are initiatives for people who are well off.'⁷⁷

The only project reported to be providing assistance with fuel is a previous initiative by the Norwegian Refugee Council to provide fuel-efficient stoves and charcoal to the most vulnerable IDPs in Konyokonyo and Shirikat. In general, there is a sense that energy needs are an individual challenge and left to private enterprise. Respondents indicate limited awareness of NGO support for their fuel needs, and no hope of government interest, let alone assistance:

I don't think there has been anytime when people asked the government [about energy needs] because there has never been a time when the entire community lacked fuel or energy. Some will have it and others will not, so there is no point in people going to government.

Secondly, it is an offence to go and cut trees for whatever reasons, cooking or building, so if you go and tell government, 'We are lacking fuel because someone in the forest is attacking us when we go to get wood', you will be in trouble with the government. So, people don't ask the government about fuel because they will arrest you for cutting trees.⁷⁸

⁷⁶ Interview with a married woman, Shirikat, 19 May 18.

⁷⁷ Interview with a middle-aged woman (female-headed household), Shirikat, 21 April 2018.

⁷⁸ Interview with seven middle-aged men, Shirikat, 27 May 2018.

5. Deforestation: Concerns and solutions

Recent reports on the environmental consequences of increasing charcoal production stress the need to raise awareness among the South Sudanese population regarding the dangers of deforestation.⁷⁹ This study finds no shortage of such awareness. When asked about the effects of cutting down trees, for example, almost every respondent speaks eloquently about the negative consequences, associating deforestation with increased wind and heat, and decreased rainfall and shade, as well as the loss of previously protected fruit trees, bird life and beauty. As this woman elaborates: ‘Trees provide us with oxygen and shade. If they are cut down, we cannot get enough oxygen and the wind that blows heavily will not stop and there will be too much dust. We may end up in a desert.’⁸⁰ Another woman demonstrates ample awareness of the value of trees:

Having trees enables the prospect of more rain that results in farming and the fight against hunger. ... Before this serious deforestation, my mother told me rains used to start immediately in January and continue throughout the better parts of the year in Juba. Juba used to be cold. But these days, the rains start in April and not as continuously as it used to be.⁸¹

Women emphasize that they only collect wood from ‘trees that are dried up and fallen’.⁸² Several people indicate that they had planted trees in their own yards for shade or fruit, and IDPs in Shirikat report that they are forbidden to cut the remaining shade trees in their camp.⁸³

Many people interviewed also have clear ideas about solutions, asserting that the only way to protect the environment while meeting people’s needs for energy and livelihoods is through enforced tree planting schemes. This respondent succinctly explains:

If many trees are cut down, then the environment becomes ugly. But if the trees are not cut down, then we will not have charcoal or wood for building or cooking. So the solution is for people to cut down and plant trees at the same time.⁸⁴

Some of those interviewed recall such tree planting schemes in the past in Yei.⁸⁵ Another woman elaborates: ‘You know, we South Sudanese live on trees. We cook with trees,

⁷⁹ UNEP, ‘South Sudan’.

⁸⁰ Interview with a woman market seller (female-headed household), Gudele, 27 May 2018.

⁸¹ Interview with a married woman, Shirikat, 13 May 2018.

⁸² Interview with two married women, Shirikat, 20 April 2018.

⁸³ Interview with three married women, Shirikat, 6 May 2018; interview with Interview with female and male IDP camp leaders, Shirikat, March 2019

⁸⁴ Interview with three married women, Shirikat, 6 May 2018.

⁸⁵ Interview with three married women, Shirikat, 6 May 2018.

build with trees and even get medicine from the trees. So the solution for the concerned authorities is to start planting trees.’⁸⁶

Those interviewed are equally clear about the economic and political context for charcoal production and use, which require fundamental improvements in terms of peace and economic recovery. One respondent links this to planting trees: ‘We can plant trees wholeheartedly to beautify our home when there is freedom. When there is peace, there is freedom.’⁸⁷ Another explains:

The reason why people cut down trees is because they are hungry and have no other means to feed themselves. So some people cut down trees to make charcoal to sell and eat from their earnings. ... We first need peace so that we can start thinking about other issues. For example, the cutting down of trees will be regulated, so people will only be using dry trees.⁸⁸

In the current context, however, people find it difficult to see how charcoal production could be prevented or effectively regulated, given the vested interests in the trade. A civil servant observes:

The solution is with the government. If they pass policy that protects forests maybe it can help around towns. But I don’t think it can have an impact inside the forest, even if they put wildlife guys [protection officers] there. I don’t think it can work because it [charcoal production] is a profitable business.⁸⁹

The best solution in this context, according to one charcoal trader who is much concerned about the environmental impacts of his trade, is to better regulate rather than trying to ban production:

I am still insisting on the role of the government because it is everything and they know what to do to safeguard our trees. I am not saying that they should give instructions to ban all tree cutting but I am rather saying it should be well organized and not careless cutting.⁹⁰

Despite the widespread belief that the government should be responsible for regulating charcoal production and preventing deforestation, no one who was interviewed feels able to talk to government authorities about their energy needs: ‘We don’t meet with them because we are civilian. So we have no ideas on how to deal with them.’⁹¹ Another woman emphasizes that energy is only one among the many aspects of the economic and political crisis in the country: ‘The soldiers’ salaries rarely come, and no one asks

⁸⁶ Interview with a married woman, Shirikat, 13 May 2018.

⁸⁷ Interview with a woman market seller, (female-headed household), Gudele, 27 May 2018.

⁸⁸ Interview with a middle-aged woman (female-headed household), Shirikat, 21 April 2018; interview with a middle-aged married woman, Shirikat, 5 May 2018.

⁸⁹ Interview with a married female civil servant, Shirikat, 21 May 2018.

⁹⁰ Interview with a male charcoal trader, Suk Libya, 24 March 2019.

⁹¹ Interview with a middle-aged widow (female-headed household), Shirikat, 5 May 2018.

[government], let alone asking about electricity. Children are sent out of schools because of school fees and no one talks, let alone asking for energy.⁹²

Regardless of education levels, ordinary people in Juba are well aware of the environmental consequences of their reliance on charcoal and fuelwood. They also rightly place this in the broader context of the dire economic situation and recent conflicts in South Sudan. In general, these challenges have ensured that neither the energy needs of the population nor the environmental effects of relying on fossil fuels and biomass receive priority attention from the government or international agencies.

⁹² Interview with four women, Shirikat, 8 May 2018.

6. Conclusions and recommendations

As demonstrated through the varied voices of the South Sudanese people who participated in this study, there are no quick-fix solutions to the challenges and effects of meeting urban energy needs in the country. While the South Sudanese government has ambitious plans to develop its electricity infrastructure through both fossil fuel and renewable energy sources, such as hydropower and solar,⁹³ given the other challenges it faces, this will clearly take considerable time and investment. Plans need to include the sprawling suburbs of Juba and other towns and cities, if electricity is to be made available to the majority of urban residents. Even then, electricity is likely to be beyond the capacity of impoverished residents to afford, especially for high-consumption activities such as cooking. The need for cooking fuel will therefore continue to drive charcoal and fuelwood consumption for a long time to come, as demonstrated by urban energy markets in neighbouring countries.

There is clearly no way in which charcoal production could or should be halted, at least not without having a devastating impact on the nutrition and safety of urban residents, especially women, as well as the livelihoods of producers and traders. In any case, it is unlikely a ban would be effective due to the vested interests that have developed in the charcoal trade and the limited capacity for enforcement.⁹⁴ Even a reduction in charcoal supply would have a detrimental effect on urban consumers, since it would entail further price increases.

Charcoal and wood are not being produced or consumed in ignorance of the actual or potential negative effects of deforestation. They are being produced and consumed out of basic necessity. This research among a range of urban residents, many with very limited education, finds no shortage of awareness and concern about climate change and environmental degradation, as well as the immediate effects on health of smoke and pollutants. In the absence of external support, there is also considerable evidence of women's own initiatives to conserve fuel for economic reasons by constructing more fuel-efficient stoves—indeed this innovation is one positive effect of the economic hardships they are facing. It also demonstrates how women are bearing the brunt of energy poverty, with an often daily struggle to obtain means to cook for their families.

It is therefore important that these women—and the urban poor in general—are not made to be further responsible for the environmental costs of meeting their energy needs by measures that would decrease fuel supplies or increase their cost. Regulating fuelwood extraction and charcoal production is a sensitive matter, and there is much

⁹³ Toby, 'Energy-short South Sudan'.

⁹⁴ Limited institutional capacity is highlighted in Adkins, 'REDD+ Country Needs Assessment for South Sudan', Geneva: United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation (UN REDD), 2016.

to learn from the experiences of neighbouring countries, where bans have had mixed effects. Biomass has the potential to work as a renewable form of energy, if replanting, regulated cutting and efficient charcoal production practices can be ensured.⁹⁵

On a more positive note, there is clearly potential for initiatives to join up with women's own efforts to conserve fuel through the provision of fuel-efficient stoves, as some organizations have recognized. Again, however, this needs to be done carefully and in consultation with local populations (especially women), taking into account women's cooking practices and food types, along with their preference for moveable stoves to cope with weather changes. Equally important is consideration and integration into the existing market economy for stoves and fuel. It is crucial to recognize that the introduction of new stoves may have major cultural, dietary and economic effects and implications, which could hinder uptake.⁹⁶

Above all, energy needs to be considered more fundamentally in relief, development and economic planning as integral to people's basic needs. Energy also needs to be taken into account from environmental, gender, protection and conflict sensitive perspectives. The types of food provided through relief distribution, for example, often require extremely long cooking times (such as beans), and the energy costs of their cooking (including women's often invisible labour) need to be factored into their value.⁹⁷ Women who are unable to afford charcoal from the market are also compelled to take risks and bear the physical burden of collecting wood or other materials, raising issues of gender protection and health. Energy needs therefore contribute to the case for cash transfer or work schemes in urban areas.

The increasingly lucrative charcoal trade is a likely driver of conflict in rural areas, especially if and when people return from displacement. More research is needed on the practices and governance of wood extraction and charcoal production in these areas, including the role of local and traditional authorities in managing and mitigating the environmental effects and conflict potentials.⁹⁸

A more joined-up approach is therefore needed on the part of government and international agencies. This will allow for better understanding of the needs and interests embedded in energy supply chains—all the way from tree cutting to household cooking—in order to design policies and interventions that are sensitive to the range of implications from conflict and protection issues to health and nutrition. Energy needs to be promoted as a cross-cutting issue in policy and programming.

⁹⁵ Mendum and Njenga, 'Integrating wood fuels'.

⁹⁶ Also see: Mendum and Njenga, 'Integrating wood fuels'; Meena Khandelwal et al., 'Why have improved cookstove initiatives in India failed?', *World Development* 92 (2017).

⁹⁷ Focus group discussion with female IDPs, Konyokonyo, March 2019

⁹⁸ The Sudd Institute, in collaboration with University of Cambridge, Makerere University, Gulu University and other institutions in Kenya and Tanzania, is currently examining some of these aspects.

This also has direct implications for government and international agencies, which should be in a better position to develop energy-efficient and environmentally sustainable practices and infrastructures than poor urban residents are. As a recent report urges, international agencies should be leading the way in switching to renewable energy sources and donors should be supporting longer-term initiatives in this direction.⁹⁹

⁹⁹ Mozersky and Kammen, 'South Sudan's Renewable'.

Glossary of acronyms, words and phrases

AfDB	African Development Bank
<i>buor</i>	(<i>Dinka</i>) heat-conserving stove made from mud and brick constructed around a bicycle rim
FAO	Food and Agricultural Organization of the United Nations
IDP	Internally Displaced Person(s)
ktoe	kilotonne of oil equivalent
PoC	Protection of Civilians (UN designated site)
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
UN REDD	United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation
WCS	Wildlife Conservation Society
WFP	World Food Programme (United Nations)

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In South Sudan, access to energy is crucial for survival, recovery and resilience in what is an extremely challenging economic and security environment. *Fuelling Poverty*—a product of the *Energy on the Move* project—examines the challenges of meeting everyday energy needs for the urban population of Juba. Recent urbanisation, conflict and economic crisis have fundamentally reshaped the amount and forms of energy that people can access. Primarily this has involved a major expansion of the charcoal trade and reliance on urban markets for purchasing household fuel, with implications for environmental degradation and conflict potential in the surrounding rural areas. In particular, the report focuses on the lives of Juba's women, who are at the forefront of the daily effort to find fuel. It concludes that more efforts—both national and international—should be made to improve access to clean and affordable energy sources, which are fundamental to the health and wellbeing of both people and environment.

