

THE LIVED EXPERIENCE OF ENERGY AND FORCED DISPLACEMENT: KAKUMA REFUGEE CAMP, KENYA

Produced in partnership with:

The Lived Experience of Energy and Forced Displacement: Kakuma Refugee Camp, Kenya

Practical Action uses technology to challenge poverty in developing countries
Transforming lives, inspiring change

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Introduction

This report focuses on the lived experience of energy in Kakuma refugee camps in Northern Kenya. The energy needs of refugees and displaced people is generally an understudied and research area: currently the energy needs of millions of displaced people are not being met by humanitarian agencies or by people themselves (Lahn and Grafham, 2015). Our research aims to understand the detail of how refugees perceive, use and understand energy, by focusing on their everyday lives and priorities.

Kakuma Refugee Camp is located in Turkana District of the north-west of Kenya. Established in 1992, the camp harbours multiple communities; the main populations originate from South Sudan, Somalia, Ethiopia, the Democratic Republic of Congo. There are smaller groups of refugees from Burundi, Eritrea, Uganda, and Rwanda. The camp population is currently estimated to be over 180,000 (UNHCR 2017). The UNHCR has the main mandate for the coordination and management of refugee-focused interventions in the area, including but not limited to provision of energy to refugees. However, many other organisations such as WFP, UN Habitat, IRC, and UNICEF are also present. For this study we have collected data across a range of 5 sites in the area: Kakuma I, II, III, IV, and the newly developed camp of Kalobeyei. Some of further background to the energy specific situation in Kakuma is available from the detailed energy quantitative surveys already undertaken on Kakuma I by the Moving Energy Initiative and Practical Action.

In order to understand the energy needs, priorities and perspectives of refugees across the Kakuma camps, this report focuses on lived experience by analysing how refugees portray awareness and understandings of energy, the reality of their energy situations, how people experience changes and vulnerability with regard to fuel poverty and scarce resources. To do this we have developed and used an innovative qualitative methodology designed to listen to the stories and perspectives of both refugees and host communities. The data for this study

was collected from April to September 2017 and is focused on listening to the needs and priorities of refugees.

This report is structured by the outcomes of our research on lived energy experiences in contexts of displacement. First an overview of the methodology used is provided, before moving on to discuss our findings on the nature of technologies, exchanges, and consumption in Kakuma. We then analyse these findings in terms of three major narratives uncovered during this research on exchanges of food and fuel, firewood use, and host-refugee interactions on energy. This report asserts our main findings: that refugees determine their own energy needs in ways which are often not supported by donor programming, that community and ethnic backgrounds strongly influence energy use, and that the lived experience of individuals is vital to understanding the total energy access needs of refugees.

Methodology Summary

This study uses a qualitative approach to analysing the needs of refugees and host communities in Kakuma in Kenya. The methodology was developed in partnership with colleagues from Practical Action in Burkina Faso and the University of Edinburgh during inception workshops in 2017. This methodology was designed to focus on the opinions, perspectives and understandings of refugees and host communities on energy. This involved using a mixture of observation, re-enactment, interviews, ethnographic-style data collection, following objects and processes, and informal discussions with individuals and communities.

To collect data we worked as an integrated team of three Practical Action researchers and two local refugee guides. An energy adviser in UNHCR Kenya supported our work and connected us with other UN agency and NGO partners, as well as refugee households and business contacts. We used a snowball method to access people which was largely done through being introduced to initial contacts who then connected us to their acquaintances, friends, family members, communities, and business partners. We used a mixture of car transport, motorbikes, and walking to get round and experience the range of spaces in the camps.

We worked in five sites, across Kakuma I, II, III, IV, and Kalobeyei, collecting data from April to September 2017 in five trips of at least ten days each. An average day of data collection involved spending the morning in one of the sites talking to households and individuals, taking a break for lunch in the heat of day, and then revisiting the camp in the afternoon to talk with business owners, NGO representatives, local implementers such as LOKADO, and energy providers for example. Access was not limited and almost all sites were open, we were welcomed in both households and businesses environments.

Some of the major limitations were that the camp has a curfew at 6pm and so it was not possible to visit often in the evenings. In addition, We didn't visit the section of the camp which is reserved for highly vulnerable and political refugees. Our positionality as women researchers was somewhat mediated in the camp as we were working with local refugee

guides, spent considerable time there so that people got to know us and were friendly and open to repeat engagements, and our position as women enabled access to Somali and South Sudanese households. We spoke mostly with women in households, and that we found it challenging to talk with men during the day as they were not often in the households during the day. However, despite these limitations we were able to gather a good selection of data and work openly with communities to hear their perspectives on energy.

Most data was collected in the forms of stories and un-structured interviews with participants. To complement this data, photography and visual data was also collected. Photography is a powerful witness and sharing energy activities through photos allows everyone - regardless to its education, language or ethnic group - to quickly grasp the essence of energy technologies and services. From a qualitative research standpoint, documentary photography provides clear evidence of energy access levels and energy backgrounds, contextualizes qualitative studies and promotes projects' visibility, while also building the evidence base to drive informed decisions on energy access and development work. The use of traditional methods of qualitative research combined with visual ethnographic approaches is particularly appropriate to enrich interpretations of emerging data, to better understand nuanced expressions of the community and to reduce the likelihood of misrepresentation of interlocutors' perspectives in dynamic and complex contexts, such as refugee camps. In these circumstances, photography provides a platform to interpret and contextualize qualitative studies and to engage ethically and sensitively with research participants, allowing a better understanding of the human condition and lived experiences.

One important aspect that came out from our fieldwork in Kenya is the strong link between visual ethnography and community engagement. The camera actually enabled research participants to feel actively involved in the investigation, in a collaborative, cathartic and empowering manner, which ensured they were able to reveal their experiences from their perspectives rather than through aseptic traditional methods of data collection. They identified themselves as crucial and active elements of the investigation, which contributed to the fact that the overall research findings were actively constructed, not passively received. As a result, by using visual ethnography approach we were able to strengthen our community engagement level, including enhancing inclusive participatory approaches and working directly with communities on their inputs to technical reports.

More detail on the methodology used is available in the Methodology Toolkit being jointly developed by the Practical Action teams in Kenya and Burkina and the University of Edinburgh (#reference when available).

Lived Experience of Energy and Summary of Outcomes

What lived is experience of energy and what does it mean to people

This research is centred around the idea of lived experiences and how refugees view their own energy use, rather than quantitative estimates of energy demand. One of the key reasons for examining lived experience this is to be able to listen to refugees concerns directly and build a body of evidence that places their needs at the centre of analysis. Our research builds on that of Van Manen (2015) on researching lived experience, focusing on how refugees portray awareness, reality, how people experience change and vulnerability.

For energy specifically, this requires understanding issues across the energy spectrum, from cooking, to solar panels, to wires and batteries, to mobile phones and TV systems, to fuels and firewood. Energy is a complex sector and we will be guided by what refugees themselves think of as energy. This approach builds on Winther's (2013) *The Impact Of Electricity* that uses ethnographic approaches to analyse the electrification of rural communities in Zanzibar. This research is different to Winther's as it focuses on contexts of displacements and refugees specifically refugees, rather than the rural energy poor. This means we need to understand the humanitarian process supporting refugees and their specific environments. Anthropological energy access studies, such as Winther and Wilhite (2015) can provide a useful background to this research, which hopes to provide an example of anthropological data collection and methods approach used within the energy sector specifically focused on refugees.

In order to understand the energy needs, priorities and perspectives of refugees in Kenya, this report focuses on lived experience by analysing how refugees portray awareness and understandings of energy, the reality of their energy situations, how people's experience changes, and how communities are vulnerable with regard to fuel poverty and scarce resources. We define the lived experience of energy in contexts of displacement as a holistic experience of energy, including cultural and practical experiences of energy and systems: how these experiences influence people's energy access needs and priorities, how refugees and displaced populations use and value energy, and the position of energy within communities. This involves understanding energy at the level of the individual and situating this within wider community understandings. As Cloke et al have suggested energy perspectives and 'sociotechnical journeys are as much shaped by the material realities and lived experiences of individuals and communities are subjected to resulting policies and applied technical interventions, as they are by the imagined futures and socially constructed experiences of politicians, practitioners and experts' (Cloke et al, 2017, p2). In this research we will also examine 'energy supporter objects and processes' which we define as material products, services, and things which surround the electrical and thermal dimensions of energy: this

includes wires, casings, cooking pots, phone chargers, mobile payment and monetary systems for energy, tools for repair, and modification materials, etc.

The dimensions of the lived experience of energy access in situations of displacement can include, but are not limited to:

- Why people use energy: what are their priorities and perspectives.
- How people use energy: when is energy used and what for what purposes.
- What relationship is there for people between energy, food and fuel and their situating environment.
- What cultural preferences influence people's energy choices and priorities
- How much does it cost households and businesses: people's own estimates of value and costs as well as market data and evidence on prices.

It is to these perspectives and understandings within refugee camps in Kakuma in Kenya that we now turn.

Varying Energy Access Levels within Four Different Communities

Lived experiences can vary between displaced populations in Kakuma Camp. The four main groups of refugees (the South Sudanese, Congolese, Ethiopian and Somali), have distinctly different experiences when it comes to energy, as their cultural background, community structure and their resource access all influence their varying levels of energy. The four main groups of refugees in Kakuma mostly live segregated from each other and in some cases do not really interact by choice. The residential compounds and markets are segregated, with different ethnic groups clustering in different neighbourhoods, and even the schooling system has a high degree of segregation. The cultural background, sense of community, and refugee's own resources, all have influence on levels of energy access. Unsurprisingly, the lived experience of energy is different for women than it is for men. There are substantial differences in energy access as a South Sudanese, Congolese, Ethiopian or Somali in Kakuma Camp. A brief summary of the types of communities and their energy access levels is provided below.

Somalis own by far the majority of the businesses in Kakuma and appear to be the richest group in the camp in terms of business-based energy access. While this is difficult to quantify, data on costs and uses of energy by both this project and the MEI suggests this is accurate. They need energy to run their businesses which is often provided by a Somali mini-grid operator at an exceptionally high price. The minimum cost of connection for businesses is 4,000 shilling (\$40) and some go as high at 10,000 shilling (\$100) for those businesses that own high electricity consuming goods, like fridges. The mini-grid provider provides the business with multiple points of connection (lights or sockets), the higher priced packages have the ability to connect a fridge, fan, TV, or any other higher energy use appliance. In comparison, the cost of a socket or light for households is usually around 500 Shillings per month and consumers can choose what services they want. Connections for televisions and radios are particularly popular for

businesses as people value access to news highly and will visit shops for this purpose, as well as to consume or purchase commodities. Some households are spending 1,500 Kenyan shillings (\$15) on electricity per month which includes two bulbs and a socket connection. In the Somali communities, we witnessed an oligopoly of small mini-grid businesses, owned by a couple of Somali business people, coming together to set prices for electricity and limit the communities to only purchase power from these few suppliers. In terms of cooking, many Somali's have LOKADO stoves that use firewood, as well as three stone fires made from mud. Both types of stoves are used outside the homestead.

For a humanitarian context, the Congolese households in Kakuma often have an abundance of energy products, including motorbikes and flat-screen TV's. Substantial money for these costs appears to be provided through remittances from abroad, although this was challenging to quantify. The remittances are sent electronically through the one of the many mobile money payment systems active in East- and Central Africa. Congolese appear to have considerable energy access in different areas within the camps. However, most of their 'energy wealth' is invested in terms of energy products, such as solar panels, TV dish, and standalone systems, radios, and motorbikes. Rather than spending on energy costs for their businesses. The Congolese community seem to have higher levels of household-based energy access focusing on energy products and energy to power these products. The sources of power in the Congolese compound seemed to come from a mixture of privately owned diesel generators and solar systems. We observed many households using multiple cook-stoves to cook food quickly, using a mixture of market-brought Kenyan ceramic stoves, LOKADO stoves and three stone fire stoves.

The Ethiopians are the oldest inhabitants of Kakuma Camp: they live in a gated community within Kakuma and you rarely meet an Ethiopian refugee in another part of the camp. The Ethiopian's have their own market and trade often within their own community. There are specific Ethiopian focused businesses in the camp, an example of these are the multiple Ethiopian restaurants which cater for both Ethiopians and other members of the community. The Ethiopians are a very tight knit community that depend heavily on their communal structures for their energy access. In strong contrast with the electricity provision on the Somali side of the camp, the local mini-grid providers in the Ethiopian quarters do not operate for profit. We interviewed an Ethiopian mini-grid provider who charged roughly 300 shillings (\$3) a month for multiple connections in households. However, if people could not afford to pay he would give his Ethiopian customers access for free, allow them to pay in the future using credit, or have people pay whatever they could afford. But the capacities of the Ethiopian mini-grids is not enough for the bigger Ethiopian restaurants. These restaurants have no choice but accept the 'Somali prices' and be connected to the more expensive Somali mini-grid providers to ensure reliable power. For cooking, many households were also using the stoves from LOKADO, as well as charcoal stoves from the market. Different dishes are made with different stoves depending on the intensity of heat needed.

The South Sudanese compounds have little or no access to energy products or services. We

often found that the South Sudanese community is the newest and poorest community both in terms of socio-economic wealth and energy poverty in the camps. The community appears to be the poorest in general and has little access to informal economic ways of earning money and are not getting remittances. It was common to see a compound without any lights or firewood. Some households did have solar lanterns, gifted to the female children in the household when they attend school. But many South Sudanese families had sold these lanterns on the market for around 2,000 shillings (\$20). Some households used homemade lanterns and wick lamps that were designed for Kerosene. However the households could not afford Kerosene, which is not widely available in the camp, and so this technology was largely not being used. For cooking, the South Sudanese appeared to use more traditional stoves made from clay and often reported having to forage for extra firewood.

Within the camps we often observed energy wealth that was demonstrated not in terms of money, costs or disposable income, but in terms of what households could afford. For example some households could afford to hire a Turkana woman to transport firewood from the distribution centre to the house and some households could afford to cook pasta and eat meat for lunch, while others were visibly poorer in terms of only going by one meal per day, or selling part of their food rations for as little as KES10. Part of our methodology involved understanding, in the context of the camp, what it means to be rich. Our qualitative approach enabled us to talk openly with people about remittances, the Bamba Chakula (electronic food vouchers) cash-based mechanism, and their other methods of gaining income rather than focusing specifically on the costs of electricity access from a mini-grid or the cost of charcoal.

The vast differences in energy access, priorities and consumption in Kakuma camp appear to be between the communities and not within the communities. However, there are of course still marginalised and vulnerable people within the camp. Single mothers, the elderly, disabled people and single person households often receive extra food rations and cash-transfers from the donating agencies to mitigate their vulnerability. It is particularly challenging for these groups to collect and transport fuel as they largely do not have money to spare on transport costs. Similarly, their ability to buy additional firewood or energy products from the markets is reduced due to the increased costs of being alone. The extremely vulnerable groups; LGBT, political refugees, and women who have escaped domestic violence are within a separate part of the camp that we did not have access to, which makes it hard to understand their energy needs.

Data Collection and Analysis

Full details of the data collection methodology used in this study is described in the accompanying introduction to these case studies, 'Qualitative Methods for Research on Energy and Forced Displacement'. An energy adviser in UNHCR Kenya based in Kakuma supported our work and connected us with other UN agency and NGO partners in the camp, as well as refugee households and business contacts. Through these contacts, we used a snowball sampling method which allowed for a more natural data collection process. We used a mixture of car

transport, motorbikes, and walking to get around and experience the range of spaces in the camps.

We worked in five sites, across Kakuma I, II, III, IV, and Kalobeyei, collecting data from April to September 2017 in five trips of at least ten days each. An average day of data collection involved spending the morning in one of the sites talking to households and individuals, taking a break for lunch in the heat of day, and then revisiting the camp in the afternoon to talk with business owners, NGO representatives, local implementers such as LOKADO, and energy providers for example. Data was collected in this way to reflect the daily pattern of life of families and communities in the camp and the timings required by NGOs and implementing agencies. Access was not limited and almost all sites were open, we were welcomed in both households and businesses environments.

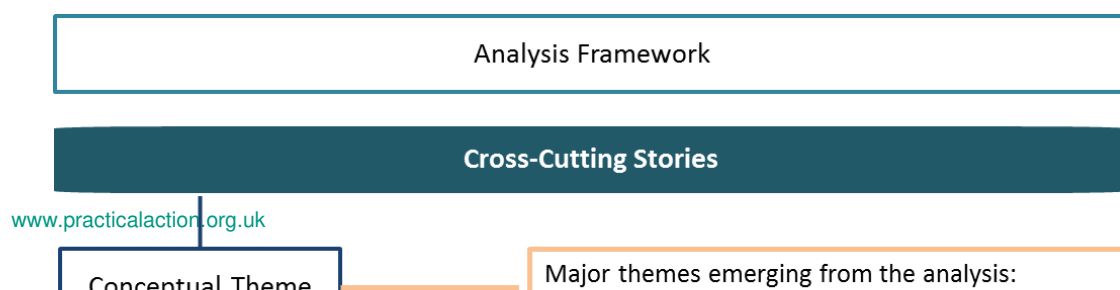
A limitation of this data collection process was the 6pm camp curfew and so it was not possible to visit often in the evenings. Our positionality as women researchers was somewhat mediated in the camp as we were working with local male and female refugee guides, spent considerable time there so that people got to know us and were friendly and open to repeat engagements, and our position as women enabled access to Somali and South Sudanese households. When collecting data in households, our interactions were mainly with women, men were often not in the households during the day .

Analysing Findings on the Lived Experience of Energy in Kakuma

To understand the lived experience of the communities in Kakuma our analysis was guided by three central themes of the research: consumption, technology, and exchange. These themes emerged during the Energy and Forced Displacement project's research design workshops in Kenya and Burkina Faso with University of Edinburgh colleagues, and in the course of the initial research trips to the camps (See Qualitative Methods for Research on Energy and Forced Displacement).

The diagram below presents an overview of our approach to presenting our results and analysing the findings from this research.

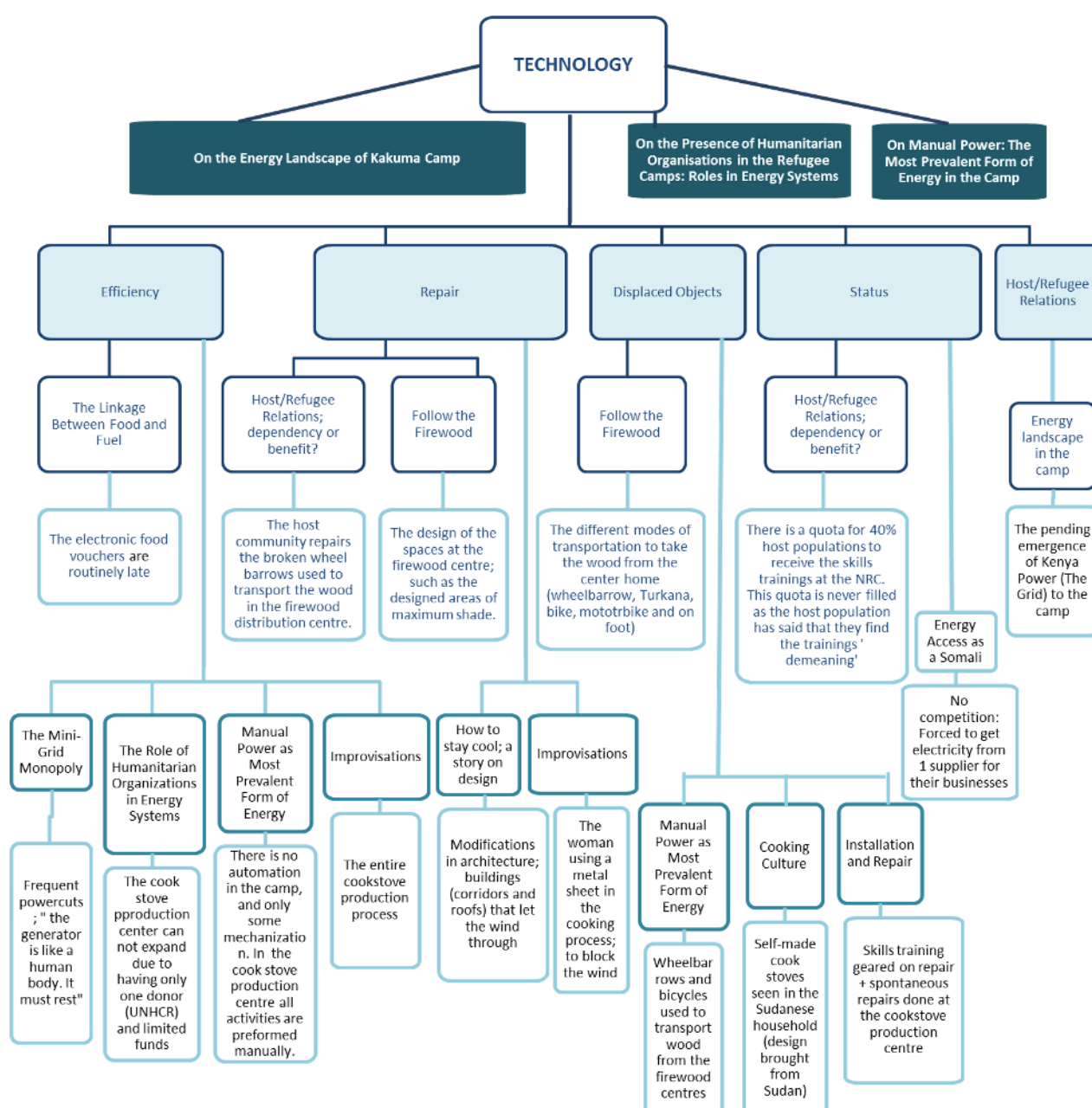
As there are many complex elements within energy use, we have structured these by conceptual and practical themes. Within these categories, example stories are presented in this report to enable readers to understand multiple dimensions of the lived experience of energy access in situations of displacement can include. Within the stories presented, we cover a range of angles, including: Why people use energy, how people use energy, what relationship is there for people between energy, food and fuel and their situating environment, what cultural preferences influence people's energy choices and priorities, and how much does energy costs cost households and businesses.



Analysis and Discussion of Themes

Technology

Technology is one of the broadest themes in our analysis, covering physical technologies such as lanterns and generators, to sources of energy such as solar and diesel, to the adaptations and innovations that refugees create to meet their energy needs. Several stories and findings are highlighted in this section on technology. First we start with an overview of the energy landscape of Kakuma camp and a discussion of our finding that energy in the camp is both a problem of availability and accessibility. The diagram below highlights the different stories and sub-stories which have emerged during our research on technology.



This report then highlights several findings on technology, including that:

- Energy also changes the physical spaces of the camp, as technologies specifically alters and changes the landscape around them
- There are multiple sources of energy from multiple organisations and individuals within the Kakuma camps.
- Roles and responsibilities in the energy system of Kakuma are not limited to organisational remit or individual responsibility.
- Cooling in Kakuma is often a story of local design and entrepreneurship.
- Technologies in the camps are often examples of energy innovations: several different day-to-day improvisations and modifications of energy systems
- Manual power is the most prevalent form of energy in the camp.

The Energy Technology Landscape in Kakuma Camp

Due to the very different energy elements and levels, it feels like there are two worlds of energy technologies access within Kakuma Camp. Access is very multi-tiered. For example, there are households who not only have lanterns, but also, air conditioning and electricity connection. On the other hand, some people use candles for lighting while the wires of the mini grids are passing over their homes. To build a full picture of the energy landscape there is a need to understand all dimensions of energy and how these fit together. We found that there is not so much a problem of availability as there is of sustained accessibility. Within the camp we found many examples of traditional cooking technologies and cooking products, as well as TV dishes, solar home systems, solar lanterns, diesel generators, fridges in shops, mobile phone charging stations, telecommunications masts powered by solar panels, and batteries.

One of the most marked features of the energy landscape of the camp is the contrast between hyper-modern and advanced energy technologies, contrasted with examples of people living next door to each other with almost no energy access. These examples presented a very stark contrast in multiple energy experiences within the camps. One example of this was brought up by children in the camp who showed us how they use the street lighting next to their household compound to do their homework. The children were told that these powerful lights are only for public streets, which they did not understand. They asked why the lighting could not also be in their compounds, as they would be able to use the light better and protect it from vandalism. Further discussion of this example can be found in the box.

Within the energy landscape of the camp, national grid lines are present. As part of the electricity modernization programme, Kenya Power, the state-owned utility company, has started laying out the distribution infrastructure in Lodwar and parts of Kakuma refugee camp, but is not electrified yet and there are no clear plans for when this will be done. While going through Kakuma 1 market we noticed some poles, national grid pylons and lines, had already been set up through the main road all the way to some sections of “Hong Kong” the periphery

section of Kakuma 1. Electricity lines are present, ready to connect the main streets and markets, but currently there are no active plans to connect the households. Kenya Power intends to solely connect businesses, as the businesses are judged as willing and able to pay connection fees and power charges. Though different to find formal evidence on, we learnt that Kenya Power had asked UNHCR to pay, for households to be connected to the grid. The energy source for this 'grid' power is actually a local mini-grid in Turkana town on the edge of Kakuma town and is in fact not the 'full grid' connected to rest of Kenya. This 'mini-grid' is currently a small diesel generator, and is currently not in operation but is physically installed. These observations tie strongly into host and refugee relations in the camps: highlighting how some communities seem to have considerably great potential for energy access technologies to reach them, such as refugee business owners and Kenyan host communities. They may be seen as more 'highly valued' as they can be customers of energy services, who are able to some degree to pay for their energy, whereas poorer households may be excluded from the market due to their perceived (if not always actual) income.

Energy also changes the physical spaces of the camp, as technologies specifically alters and changes the landscape around them. An examples of this is the solar powered streetlights outside compounds which enlighten certain spaces, but largely leave gaps of light in the household compounds themselves. Communal and street lighting is normally perceived as a collective good by the community, with many people noting that lighting on the streets would enable them to move more freely through the spaces. Similarly, the presence of diesel powered Gen-sets in the Humanitarian agency compounds and in some sections of the camp such as the NRC Youth Center enable 'hot spots' of lighting and grid level power within the physical boundaries of the camp. These energy changes are not just limited to electricity but also include the presence of telecom masts powered by solar panels, and the numerous boda-bodas and piki-pikis (bikes and motorcycles) which are a common form of transport within the camp.

Cooking in the camp is very mobile and relies on multiple sources. However, many energy interventions (in both the humanitarian and development landscapes) have focused primarily on improved cookstoves. Our research reaffirms that cooking goes beyond cookstoves and is fully integrated into most aspects of camp life. There are multiple sites of engagement that focus around energy for cooking, for example food distribution centres, a local cookstove production centre, stoves used within households, and the transport mechanisms used to move food and cooking technologies around the camps. The common cooking fuel options include firewood, charcoal and in small instances briquettes. At the entrance of Kakuma 1 there is a petrol station which sells among other products, liquefied petroleum gas (LPG), a modern cooking option in Kenya. However, during our visits to the households in the camp we did not come across anyone using this option.

The energy landscape within Kakuma camp is varied and mutli-layered, and a full description of every element is not possible here. However, considerable detail of the physical and connected energy spaces is outlined in the report below and a contextual report on the energy levels in Kakuma 1 has been produced by the Moving Energy Initiative. Below an indicative energy

landscape map has been produced, showing the key types and sources of energy within the Kakuma camps. It is not an exhaustive image, but suggests a flavour of the energy landscape of the camp.

Energy Landscapes: Qualitative Stories on Perceptions of Energy Technologies

While visiting a South-Sudanese compound in the rain, we saw the usage and limitations of the energy environment. Just outside the vast compound was a solar-streetlight, meant to illuminate the dark street at night. The 6 children of the household use this light source to do their homework. Standing in the corner of the compound, the children are able to use the this light to read and write at night. But when it rains, this option is no longer available to them as there is no shelter in the corner of the compound. “why can’t we have that light inside our compound?” they ask. “We are told that this light is only for streets, but we use it as well! And if it is placed within our compound it can be protected from vandalism”.

In Kakuma the South Sudanese communities are some of the most energy poor communities in the camp. Often times the compounds of these communities will have slim to no energy access. When visiting a large South Sudanese compound, with around 60 people living in it, we saw that there were no lights. “How could we possibly have electricity? We are refugees!” a woman exclaimed. “When you are a refugee you cannot have electricity”. But when standing next to her house, and looking up, one could see power lines going over the compound and into the neighbouring compounds. Not all inhabitants have knowledge on the possible energy access options, and when you are poor often times access to electricity is simply not an option.

Humanitarian Organisations in the Refugee Camps: Roles in Energy Systems

There are many different organisations present within the camps. There is a clear aspect of ownership that the donor organizations display. From flags and logos on tables and cars, many things are branded with the donors logo. There are large signs at the entrances to the camp and on buildings. People are left in no doubt about which organisations are funding specific activities. Many organizations have a specific role in the camp: LOKADO, a local NGO partner, and the UNHCR are responsible for energy in terms of firewood and charcoal. In this case, it seems that the Energy Development Partners such as Lokardo have their scope limited to cooking and solar lighting. But these are not the only energy types available: the mini-grid market is very prevalent in the camp and is privately operated, usually by Kenyan entrepreneurs. These mini-grids are completely unregulated and are based on a system of inter-personal trade and exchanges. While the UNHCR and LOKADO’s distributions are more focused on technologies and donations to the communities.

An example of this is the cookstove production unit which is 100% funded by the UNHCR. The stove production unit has a capacity of 800 stoves per month, which is not enough as there are currently more than 800 new households arriving every month. Thus all the produced stoves are going to the new arrivals. But at the same time there is a backlog in the replacement of stoves. The stoves last approximately 4 years, so the people that received a stove prior to 2013 are now waiting for a new stove or have returned to using previous stoves and three-stone fires. Furthermore, the host community was promised 10% of all produced stoves. Currently no stoves are being replaced and no member of the host community is receiving stoves, as the new arrivals take priority over all. The stove centre is run by LOKADO with UNHCR funding and refugees are employed with a stipend to work in the centre. UNHCR sets the parameters for the centre, production levels, and the amount of stoves to be given to the refugee or host communities. Currently, the stove production unit does not have the funds to expand. The Center operates based on one year contracts from the UNHCR, and the people that operate it do not have the business interests or backgrounds to be able to expand it. This example suggests that large donor organisations often set the boundaries of engagement with energy projects in the camp while sometimes being unable to engage with the full potential of such projects.

Energy within the UNHCR compounds is also very prevalent, with the main compound having two diesel generators (a back-up and a primary), which supply 24 hour grid equivalent power to the workers households, living and dining facilities. These generators are occasionally replaced with new ones and the old ones discarded through auctions. We came to learn that a local Kenyan-Somali had bought 6 of such and set up a local mini grid in Kakuma 1 market serving over 150 shops. The role of humanitarian organizations in refugees energy systems was also depicted when we visited several households whose members had been incentive workers for the humanitarian organisations and it was common to find battery powered solar home systems which they bought from allowances earned.

Of course, humanitarian organisations are not the only actors in the camps. Both local Kenyan entrepreneurs, Turkana community members, refugee business owners, and household members themselves are also powerful energy actors in the camp. One of the interesting questions emerging from this report is how these community members interact with humanitarian agencies, and how their feedback and voices are included within energy planning. While the role of humanitarian organisations is obviously important within the context of the camps, this report focuses on the lived experience of refugees in Kakuma. To this end, three examples are presented below of how local communities are engaging with technologies directly to determine their own energy needs.

How to Stay Cool in Kakuma: A Story of Local Design

In such a hot place as Kakuma, where fridges are not common, there are alternative ways to drink water. In Kakuma market there are jerry cans being sold, with cloth wrapped around

them by refugees and members of the host community. When you wet the cloth the fluid inside the container cools. The jerry cans come in different sizes and can be seen in use in Kakuma town (for example in the welding shop) and in households. The cloth is the same cloth used in blankets and old clothing, and it retains the water very well. People in the camp also buy refrigerated water from vendors with cool boxes or fridges.

Staying cool is also reflected in the design of buildings and structures in the camp. For example, through the creation of man-made shade on compounds and the different materials used for building (often porous, or with open spaces in between). Another method is shelters designed with windows placed directly opposite each other without glass in to allow the wind through, the creation of open spaces in buildings, and by creating high ceiling that are not completely closed.

Many of these cooling solutions are improvised and designed by refugees, and are clear examples of innovation by refugees. They represent a form of necessary innovation, driven by the need to keep cool, and are often improvised by the communities.

Improvisations and Innovation

Improvisation in energy systems does not end in cooling solutions. During field-work we observed several different day-to-day improvisations and modifications of energy systems. For example, in one household, a lady had modified her cooking experience by putting a thin piece of Mabati (sheet metal) upright next to the stove. This was to shield the stove from the wind and therefore increase efficiency and reduce fuel usage.

At the cookstove production centre, the craftsmen had modified the stove production process and had been improvised by using locally available tools and objects. For instance we witnessed the use of knives to open ventilation holes in the kiln, and the use of wheelbarrows as a sort of container for the cement mixture used to make the cook stoves. There were also many improvisations of energy technologies used for alternative processes, for example the use of a cook stove liner as a seat. We found a different cook stove turned around, repurposed as a seat, as they did not like the design of this particular stove (it was unstable). They had switched to using one of the cook stoves received from the centre.

Throughout the camps there were also cases of other innovations using stoves: in one restaurant in Kalobeyei, the kitchens contained a Save80 metal improved wood cook stove being used with charcoal as a way to keep meat sauce warm. In another instance, we met a man who offered pay TV subscriptions by combining over 15 decoders into a single bouquet channel stream. This he achieved by ingeniously connecting one decoder to the other through data cables and after which connected them to a booster that he used to link different customers. He explained that through the main TV set, he could change channels as requested by customers. In yet another instance at a bakery, the operator had tied a dry cell torch to his head, such that it could illuminate the firewood kiln, and that way he would see whether the bread was ready.

Manual Power: The Most Prevalent Form of Energy in the Camp

Manual power is the most common form of energy in the camps, this includes labour for building, chopping firewood, and crushing stones and mud for cookstove production. There is an abundance of potential manual labour in the camp, as there are many people with a lot of time on their hands. When they do find employment the refugees are not allowed to work for a salary (just a stipend), so the manual labour is cheap.

There is relatively little automation in the camp. For example, mechanical grinders for sorghum and wheat can be found in some shops close to the food distribution centre. Although there is some mechanization, manual labour trumps it by far. For example: in the cook stove production centre all activities are performed manually. For transport, it is common to use wheelbarrows and bicycles in the transportation of energy goods (mostly firewood or charcoal).

Summary: Energy Technologies and Lived Experience

One of the things that is evident from the analysis above is that while energy technologies are important to people's lived experience in terms of the availability of products and services, most people are not focused on the dimensions of the technology itself. Rather, perception focuses on whether the technology can actually complete the task at hand, whether that be cooking, lighting or charging, and not on the specific value that technology or energy access brings to people's lives. So how can technologies be adapted and modified to fit the local needs of displaced people? While the answers to this question seem obvious, humanitarian energy technology solutions often tend to focus on providing a 'perfect' or new product, rather than starting with understanding what people need energy for. Our lived experience assessment in Kakuma Camp shows that humanitarian energy solutions should start with analysing those energy products and solutions that the beneficiaries have already developed, to properly solve the needs in these communities.

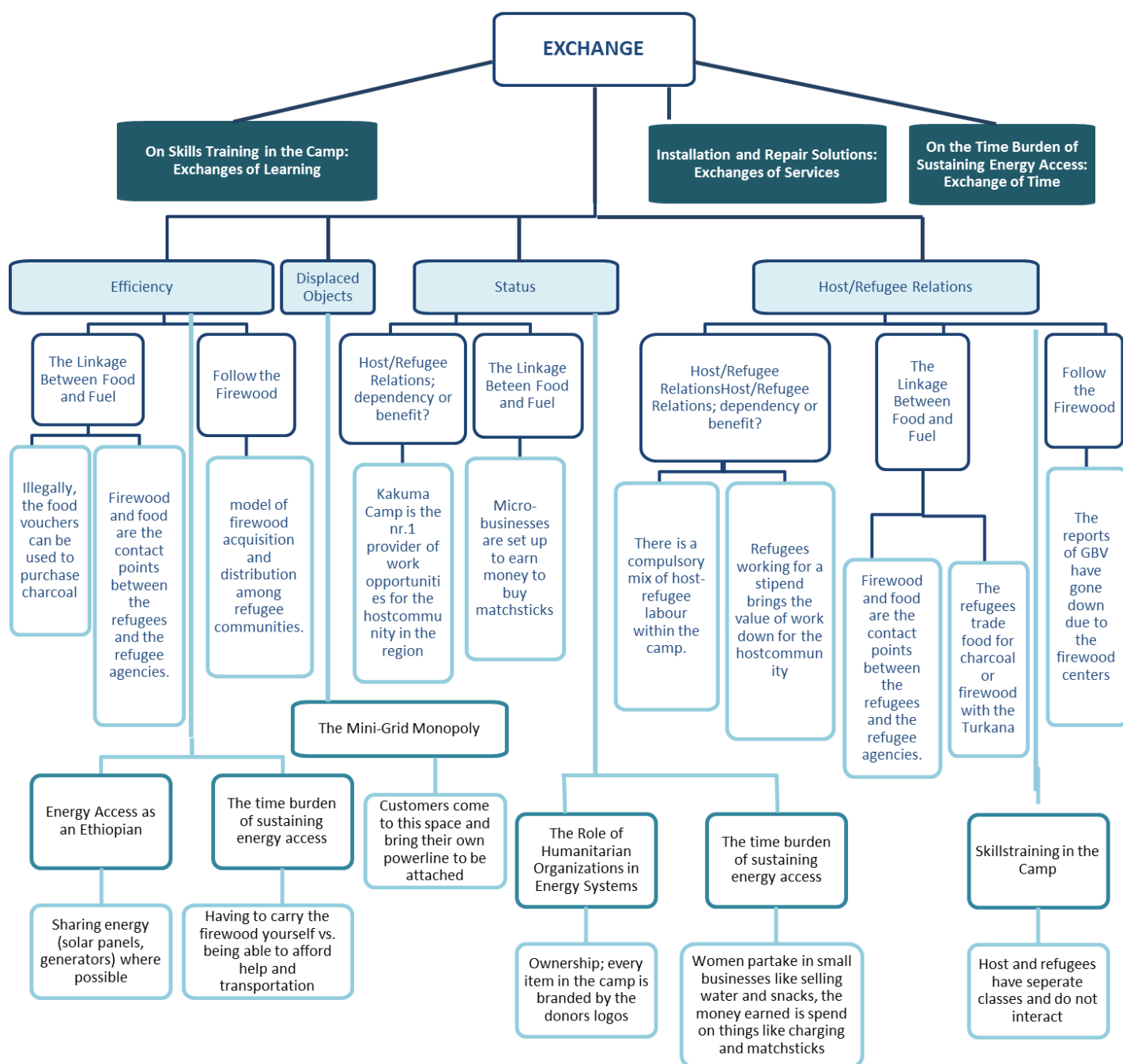
These findings suggest a number of considerations on technology for humanitarian energy:

- Firstly, that the energy technology landscape is wide ranging and has many physical determinants within the camp.
- Secondly, that local innovations and adaptations of technologies are often present within energy technology within the camp.
- Thirdly, that camp inhabitants understand energy to be not just electricity, but often understand energy technologies to include 'energy supporter' objects, such as water coolers, wires, transport for cooking fuels and food, and mobile phone charging stations.

To understand what these findings mean for other elements of lived experience in the camps we now turn to our findings on exchange mechanism and consumption modes.

Exchange

Exchanges were some of the most interesting elements of energy life within the camp. We witnessed many examples of trade, negotiation, sale and re-sale of goods, as well as discussion of exchanges of services and skills on a daily basis. Exchanges were also present in terms of installation and repair solutions which often represented exchanges of services, and exchanges of time for some activities over others to reduce the time burden of sustaining basic energy access. The diagram below highlights the different stories and sub-stories which have emerged on exchange.



Skills Training in the Camp: Exchanges of Learning

In the camp there are learning and skills training courses which are offered by the NRC and Swiss Contact. There are various courses in computer class, motorcycle repair, electrical wiring, baking, and hairdressing. Swiss Contact indicated that they always conduct labour market assessment before introducing a new course. Given that most of the courses taught are dependent on electricity, both institutions operate diesel gen-sets, with Swiss Contact opting for the small portable options while NRC has a much larger genset set up in the corner of the compound operated by a trained student and consumes up to 130 litres of diesel every week. Whereas these technologies provide the power needed to run the training equipment we felt there was a disconnect between what is taught and the reality on the ground: a perception that was echoed by many refugees and NHO workers in the camp. For example, students are trained in welding, but the course is not very popular because in the camp the students are never able to access the amounts of power needed to weld. While at the skills centre, we noted that most students charged their phones in the classrooms, and in one incidence we observed that some learners had placed solar powered torches on an elevated wood plank to charge, at the NRC centre. Given the popular use of solar lanterns in the camp, there is need for repair and yet at NRC the course on Solar training only covered theoretical knowledge and nothing on repair. Swiss Contact mentioned that they touched on the subject during electrical training, it appeared as though this was an afterthought and when we visited the centre the trainer mentioned that they had started offering solar related repairs but they had not started yet. The skills learned therefore sometimes do not lead to a sustainable livelihood for the recipients and are restricted by the levels of energy access in the camps.

This suggests that some elements of this programme has not been completely thought through. For example, students were being trained in repairing cars and not motorbikes when the majority of people use motorbikes in the camps. Swiss Contact also have a centre for electrical repairs for computers and solar lamps in Kalobeyei, where the students from the programme will repair broken electrical products for free. However, due to the distance from the main zones in Kakuma many people felt this was too far to travel for repairs. These examples suggest that energy exchanges are frequent in the camps, and often represent informal economies, but do not consider the whole energy system or needs of communities to progress beyond exchanges. Many students we interviewed also would have liked to study plumbing, as this was viewed as a good skill to have if they are resettled to other countries. However, plumbing classes are not offered in the camp as WASH services are delivered centrally. This suggests that energy skills demands were not really being listened to in the camp.

Many of these skills training programme seemed to be enhancing demand for energy services, but not necessarily supplying it. For example, NRC offer many interesting and intensive courses (full time 5 days a week from 7.30am to 4pm everyday) but do not necessarily link these skills to wider needs of the community. This can be seen as a basic supply of skills rather than extending energy access and building long-term development. There are many types of energy exchanges in the camp, for example a hairdresser from the *Swiss Contact* hair dressing class in

Kakuma 4 had a customer who needed her hair blow dried but the class did not have a generator, so when people needed such hair services that required energy the hairdressers would go to a computer shop close by that used a diesel generator. The computer shop is also an initiative of *Swiss Contact*. However, we learnt that in the training model, once all classes have ended, trainees are organised into business groups and support provided include being provided with a generator for a period of three months. This was the case of the computer shop where the hairdresser had gone to blow dry her client's hair.

Swiss Contact also provide charcoal ovens after attending baking class and are trying to start supplying solar cookers to some of their businesses. Following completion of the training Swiss Contact offer loans and business support for the refugees and host community to open their own small businesses such as small bakeries and repair shops run by students who have graduated from the programme. This is a form of energy exchange and support, building both on the energy skills learnt by students in the camp and connecting into the wider energy systems and lived experiences in the camp.

Many different refugee groups do mix during the skills training, for example Congolese, South Sudanese, and Burundis. There is a strengthening of ties between the host and refugee groups in general in the camp, but this is not really evident in the skills training programmes. There is an element of host and refugee relations as Swiss Contact is targeting 50:50 host and refugees. They did state, however, that the host community and the refugees do not mix, and that there are separate classes that lead to separate businesses. NRC classes are mostly taught in English, but Turkana people are taught in Swahili by Swiss Contact. In the case where the trainers are Kenyan locals then they have the liberty to explain concepts in local languages.

Exchanges of Services: Installation and Repair Solutions

There are a lot of activities on installation and repair going on in the camp. The majority of these are informal and involve refugees experimenting with how to fix something. Knowledge about energy repair is spread by word of mouth and through community networks. These are often within communities, for example Ethiopians will ask fellow Ethiopians to repair things and visit the shops in the Ethiopian market to get energy products repaired. In terms of gender, many women approach male neighbours and friends to find out who can install and repair energy solutions in the camp. These services are often delivered by men. Exchanges of services are open and informal, and we heard many examples of people sharing repair services and helping neighbours for free.

Most repairs occur within the camp using refugee skills. One lady interviewed in the Somali neighbourhood told us that she had asked her neighbour to install and repair her TV, mentioning that she usually asks her neighbour to fix her TV when it is broken. While there are shops in the market which offer these services of repair, people interviewed mentioned that they cannot afford to pay for these services and so use informal mechanisms of exchange to fix and repair energy technologies. There are also some instances whereby someone external is called to fix an electrical appliance, such as the Congolese household which had a solar lighting

system, or the mini-grid provider who had sourced the services of a skilled technician from Kitale, a mid-sized city some 9 hours away by road, to carry out regular repair and maintenance services on the generators. However, where possible energy solutions seemed to be sourced from within the camp and within people's own communities before seeking outside assistance.

In terms of innovative repair solutions, several examples were seen around the camp. For example, there was an instance where a Congolese couple who had a broken battery and had been advised by the vendor to drain the fluids, let the casing dry before they add new fluid, in order to keep using the same casing and avoid additional costs to buy a new battery. However, when we asked further it seemed as if this solution was unlikely to fix the problem but the people were willing to use a trial and error method to experiment whether it would work. There was also little evidence of maintenance in this situation, as regular maintenance of the battery in this example may have avoided the problem. This suggested a lack of in-depth technical knowledge on electrical engineering in the camp, rather people relied on informal knowledge exchanged from other people.

There is an abundance of older and discarded electrical appliances on multiple locations in the camp. Especially close to mini-grid operators there were disposal and waste spaces full of old wires, battery casing, solar lanterns that no longer work, and casings for energy equipment. At the NRC training centre in Kakuma 4 there were also piles of disused materials, some of which may be re-purposed and reused later on. In some locations, the Mandeleo stoves provided by LOKADO had broken and would be lying disused in household compounds. At the stove production centre there were large mounds of broken mud stoves and leftover metal materials from the cuttings of casings. We referred to these places as energy graveyards and they were often located near or within spaces specifically dedicated to energy, such as the mini-grid operators and stove production centre. There were also more general examples such as rubbish sites where rubbish was burned by some communities next to the household compounds. These sites often contained burnt energy products, such as springs from motorbikes and electrical wiring that had not combusted during the burning of rubbish. The products we saw here clearly had no value for repair or exchange within the community as they had been largely abandoned. These examples may highlight the need for repairs and for projects to consider the long-term needs of technologies in order to not result in additional waste products and rubbish around the camps.



Picture: Fixing desktop computers inside Swiss Contact's electrical repair class"

It was very notable how little official assistance from humanitarian organisations such as NGOs and UNHCR, were present in the camps. Many communities relied on informal approaches to energy installation and repair and mechanisms of exchange which enabled people do offer services to each other. There are many examples within the camps of informal economies and alternative ways of getting what is needed. This highlights a type of self-reliance very present in the camps, where individuals will try to barter and exchange services with neighbours, friends, and within their community before going outside to pay for services.

Exchange of Time: On the Time Burden of Sustaining Energy Access

Refugees are using a lot of their time accessing energy, which leads to a time burden especially for women and girls. Women (especially Somali and South Sudanese women in Kakuma) spend many hours searching for firewood. The global narrative on clean cooking suggests that if women can be supported with reducing time spent searching for firewood they will have time for other activities – both in the household and outside of it. However, even in Kakuma where large amounts of firewood are distributed for free, considerable time is spent on collecting wood from distribution centres. We saw many examples of women spending time to collect and transport firewood from different areas of Kakuma to collect firewood from distribution centres from Kalobeyei or further away within a different section of Kakuma 4. Women also spent considerable time queuing for collection and getting to the firewood distribution centres. Following interviews with women, we estimate that the whole process takes anywhere between a day and half a day. Transport time was also a major issue. Some women also hired local Turkana women or hired motorbike drivers to take their firewood home. The time burden was disproportionately high for those who were poorer and who couldn't afford some of the economic transport solutions.

The amount of firewood distributed for free on distribution days was not nearly enough, many of the families we spoke to suggested that they needed between 3 and 6 times as much as was distributed for free. The refugees get one bundle per two months per person in the family, so a family of 6 will get 6 bundles for 2 months which is roughly 60 kilos. Some families supplement this with additional firewood foraged from the local environments which are located far away from the camps, and in many instances there have been reported cases of gender based violence perpetrated by the host community who claim ownership on all biomass in the area. In other instances many refugees will meet their fuel needs by buying charcoal or more firewood. The people that live in Kakuma 1, block 11 are also customers of Sanivation and have the option to buy briquettes of mixed human waste and charcoal dust. Fetching fuel is a highly gendered activity, with the vast majority of people observed were young women collecting firewood. Most of the men observed worked at the firewood centres or were refugees using motorbikes to transport the firewood home. We also saw several young children sent to collect firewood in their school uniforms.

Having enough firewood and fuels to cook on can be seen as a mechanism of exchange and barter within the camp. Many women use food for fuel exchanges, or use informal exchanges to transport firewood. While we found some evidence of women's time burden, it was notable how many refugees used micro-businesses to mediate this time demand and used informal markets and exchange mechanisms to reduce their physical burden rather than time burden. For example, there was a South Sudanese woman selling water in the camp, to buy matchsticks to light her fire. Another South Sudanese woman who cooks 'mandazi' (dough snack), to buy kerosene for the lamps that the household uses. Several women reported selling food or easy to acquire goods in order to reduce their energy burden. For example, some women make and cook 'mandazi' (dough snack), to pay for charging phones at 10KES per charge. In this case, the woman also uses her mobile as a torch, so the battery runs out quickly and she needed an additional source of income (the mandazi making) to be able to cover the cost of charging her phone. We estimate that these micro-businesses did not substantially reduce the amount of time women had to spend, but rather they were able to spend this time on a less physically demanding activity, such as cooking mandazi rather than walking miles to find firewood. While this enabled women's time to shift to productive enterprises, they were still relying on informal exchanges and economies and having to spend the money they produced on buying fuel and firewood.

These activities do reduce the burden on women in some way, and earns women income they can spend on whatever they determine. It also reduces some of the risks of being attacked by strangers and allows them to stay close to home, but has other benefits rather than producing more time specifically. Women can be seen as exchanging time from one activity to another. This is especially valuable when considering the aspect of geographic distances. Some refugees have to move through different zones in order to get to their designated centres and would have to venture further to collect firewood from outside the camps. Using informal markets and creating their own micro-businesses enables them to be within their community and close

to their households. The women we spoke to suggested that it was a necessity for them to be tied into businesses to be able create goods to exchange for firewood and matches. For them it was vital to find alternative ways of earning money and supporting the food economy of their household.

Many women use food for fuel exchanges which drastically reduce the time burden for the women in the camp on this activity. This trade is described extensively in 'On the linkage between Food and Fuel' in this report.

Summary: Energy Exchanges and Lived Experience

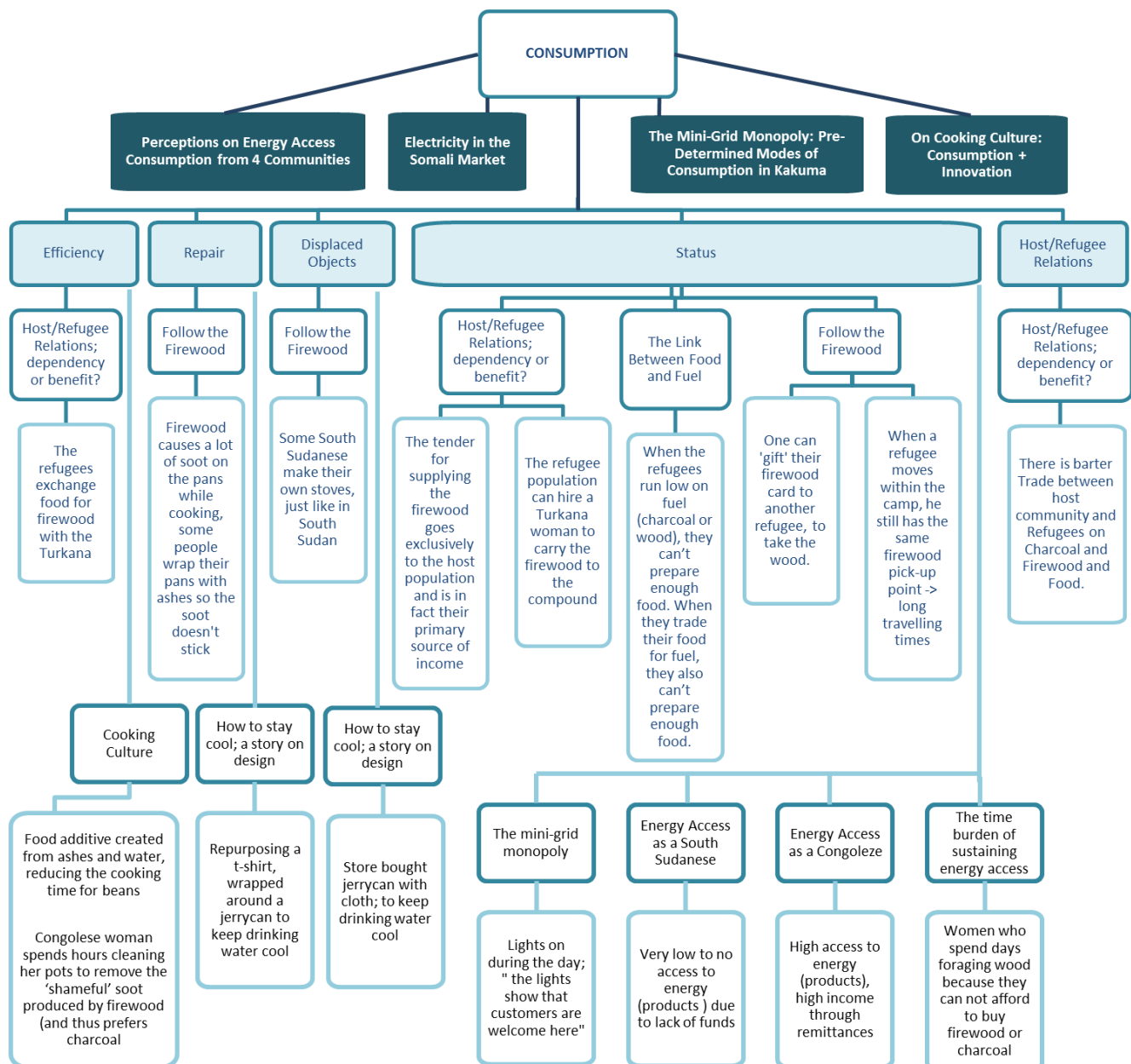
There are many examples of energy exchanges and informal trade in the Kakuma camps. Very often people's lived experience of energy within the camps seemed to centre around exchange, both in terms of knowledge and services, and barter within communities.

This study finds that:

- There are multiple examples of energy exchanges and repair in the camps. However, these exchanges are often informal and based on community networks and are often created and driven by refugees themselves.
- Energy has been neglected as a humanitarian response sector, so the informal economy has flourished and provided a set of services for refugees (by refugees and host communities) that humanitarian agencies perhaps did not anticipate.
- The time burden for firewood is still very high and disproportionately affects young women and people from poorer backgrounds. The solutions in place at the moment are not really supporting women in their lived experience.
- In terms of energy, while exchanges were very present, one finding of this research is that these mechanisms of exchange were not always working and delivering the results that refugees wanted.

Consumption

Energy consumption within the Kakuma camps is not a simple relationship between supply and demand, as both availability and reliability of energy sources and materials are scarce and scattered. Many families and businesses also demonstrated aspirational goals and desires in the amount of energy they would need which impacts on consumption patterns and trends across the Kakuma camps. Many of technologies are almost not seen as types of 'energy' consumption at all, rather are perceived as different solutions to different problems. Modes of consumption were often pre-determined, and were limited either by the types of products being supplied, or by the mechanism by which it was supplied - for example mini-grid power from diesel generators being so prevalent in the Somali parts of the camp. The diagram below highlights the different stories and sub-stories which have emerged on consumption.



Perceptions on Energy Access Consumption from the Four Communities

There are many different perceptions on energy access in the Kakuma camps. Generally we found this was guided by two things: survival needs and perceived value for money and cost. The survival mode was most evident within the South Sudanese community: for example, when the firewood is finished, there is an urgency to find more to be able to keep cooking. The second clear perception on energy access was around aspirational products and value for money: for example, charcoal was viewed by many as better value for money than firewood, but not many households could afford to access it. This difference in aspirations is not so much driven by status, rather is focused around scarce resources: The need to make most efficient use of money and trading mechanisms to get the best value in terms of quality as well as quantity.

The reasons for shifting between cooking fuels centre on what is available and how convenient it is to come by. For example, charcoal is easily available in lots of locations as the Turkana women bring it to many places in the community and the markets. Ethiopians cook different dishes with different fuels, for example they use firewood when making traditional food such as Injera, and they use charcoal when making other foods such as rice or pasta. These perceptions are a mix of traditions and practicalities - when you cook on charcoal you can leave the fire unattended while firewood needs tending often, and charcoal can reach a higher temperature quickly so it good for quick boiling cooking. Many people do not use Kerosene because can cause fire and is perceived as being unsafe, it is also not an attractive option as it expensive and unavailable.

There are also some pilots of cooking technologies in the camp, for example the Sanivation pilot (ref) which uses a mixture of human waste and charcoal dust to produce briquettes for cooking. The pilot reported people's perceptions often centred around the smell of waste coming from the fuel and concerns about hygienic. From the supply side it is being sold at the same price as charcoal and burns twice as long, however, when you light the briquettes there is faeces smell for a couple of minutes. Sanivation is currently only selling in one block, however, perceptions this technology may be a driving factor in whether the pilot can move to scale.

The cultural background of the different communities seem to strongly impact on people's perceptions and demand for electricity in particular. For example, in rural South Sudan there is often no reliable mini- grid or energy access, and as a result people's own expectations from these community in the camp are often lower than the other communities. We also found that perceptions shift very quickly, people get used to electricity very quickly and soon make it a priority within the household in terms of costs.

Within the Kakuma camps we found there are different perceptions on energy products, energy electricity and cooking. Many of these technologies are almost not seen as 'energy' at all, rather are perceived as different solutions to different problems. When people need heat to cook, they use different types of fuel depending on their cultural background or ability to afford charcoal. When people need to charge mobile phones, they will go to a refugee operated

charging station and pay 10 shillings (£0.10p). This leads to very different energy solutions within and between the communities, based on their perceptions of the energy problem rather than the solution available or the source of energy. We found that these perceptions strongly determine the types of energy consumption and levels of energy access people have within the camps.

Bamba Chakula: WFP Restricted Cash for Food

Bamba Chakula is a feeding program from the World Food Program that involves distributing restricted cash to its recipients. All the beneficiaries in the camp have received simcards, which the World Food Program uses to deposit cash on. This cash can only be used to buy strictly food items from registered vendors in the camp.

The beneficiary will only receive their Bamba Chakula cash, if they participated in the food distribution. People that did not pick up their food ration during distribution, will not be eligible to receive the cash. After the food distribution, the systems are checked and the Bamba Chakula is distributed. Verifying the recipients of the food distribution takes anywhere from 2-4 weeks, which is why the Bamba Chakula cash is often distributed late.

The vendors in the camp will sell their items on credit to the recipients when the Bamba Chakula cash is late. The names and Bamba Chakula numbers are written down meticulously by the shopkeeper before the items are given. Every month it is unclear when the shop vendors will be paid, but there is no doubt that they will be paid.

Electricity in the Somali Market

The Somali shop owners pay a premium for an electricity connection, as there is only one place in Kakuma 1 that provides this electricity connection. Prices start from 4000KES (40 dollars) per month to connect 2 small electrical items in the store. Most small shops in the street have this connection and use it to connect a light and a fan, a welcoming service in the daytime heat. 4000KES is a lot of money for any shopkeeper in Kenya, and for most refugees it is a considerable sum. And because of the high price of electricity connections, the shop owners are limited in what they can sell. Displaying electricity is a way of displaying wealth in the stores and welcoming customers in. One of the ways that the high cost of electricity has shaped the Somali Market is through the forced uniformity of the products. Nearly every store sells both electronics and beauty supplies. The electronics, like new mobile phones, can be sold for high margins. The Somali shop owners get them through contacts at the port of Mombasa or at the Eastleigh market in Nairobi. All the electronic goods are from China. The beauty products are bought in bulk in the capital Nairobi or the closest larger city; Kitale. “These products are in high demand in the camp. Every woman wants to use these products and be beautiful”.

There is no possibility to 'upgrade' and sell items that require cold storage. The power necessary for a fridge would cost 10,000KES (100 dollars), a large high amount for many refugees. This is because of the mini-grid monopoly, whereby the shopkeepers do not have a choice in electricity provider.

Stories on the Value of Electricity in the Somali Market

On all shops selling the same items: "we like electricity, and we need electricity" as one shopkeeper tells us: "competition is high, I want my customers to come to me and my store. They see the light, they know I am here and they are welcome". In the current situation it is not possible for these businesses to diversify or expand. And thus the Somali Market is flooded with shops selling electronics and beauty products. Rows of similar shops line the busy street, and electrical wires connect them all overhead.

The Mini-Grid Monopoly: Pre-Determined Modes of Consumption in Kakuma

Entering the mini-grid space in Kakuma 1, there are a lot of senses that hit you at once; the space is loud, it is dark, it is humid and it feels claustrophobic. This place is a fire hazard; there are fuel jerrycans hanging from hooks, the floor is covered with electrical parts and a narrow walking path leads you to the generators in the back. The space is packed with flammable material and there are live wires everywhere, it is unidentifiable where most of them start or end. Some wires are loosely repaired with plastic. There is a smell of old grease and kerosene that cannot escape this enclosed space.



Picture: Unidentifiable where most wires start or end

Here in Kakuma 1, the store owners pay flat rates for electricity, which are high (3,400 KES (\$3.5) for enough electricity for 2 light bulbs and a fan). There are technically two mini-grid owners in Kakuma who are providing electricity; a Kenya Somali and three of his affiliates. However, they both provide electricity for the same amount, so when you are living or running a business in Kakuma 1 there is no option to transfer to a less expensive electricity provider. This business acts as a form of both monopoly (in practice one man controls all access in the Somali market) and of oligopoly (as technically the business is operated by different people). This is an informal association, but in reality this is determined by one person.

Many refugee business owners find themselves are stuck in 'limbo' constrained by this monopoly: as the high cost access to electricity, the products being sold in the shops are very uniform, and electronics have high margins. It is not possible for the shop owners to expand in the current situation, for example one interviewee commented "I can never have a fridge. If I want enough power for a fridge, I would have to pay 10,000 KES (\$10) a month".

Despite the cost being KES 3,400 (\$3.5) a huge part of their income, the shop owners in the Kakuma 1 market still pay for their electricity. What are these aspects of electricity that still make them want this expensive electricity? Is it the light? The charging? The Somali market is only open during daytime so the energy use of the shop owners is restricted to maximum 8 hours a

day, there is usually power in the mornings, often with a gap between 12pm and 3pm, and then fluctuating power during the afternoons. Despite all these restrictions, and the expense, Somali market owners continue to pay for their power this way. Possibility because there is no real alternative and electricity is a priority need of their businesses. This can be viewed as a type of pre-determined the mode consumption in the camp: in which the levels of power vary depending on what you are able to pay for, but there is only one supplier and mode of supply available.

Case Study on the Diesel Generator Space in Kakuma 1 Market

The Kakuma 1 mini-grid owner, showed us around his different electricity providing spaces and who talked about his very lucrative business. The business is comprised of 5 diesel generators, when we visited 2 were running, 2 were waiting for repair and one was on loan to the owner's father. The mini-grid space is also a complete fire hazard. The generator space is packed with unnecessary and flammable material and there are hundreds of live wires (loosely 'fixed' with old plastic bags) everywhere. So far the owner suggested that there have been no incidents in this space to date.

One interesting aspect of this production space it that it is very hidden, both physically and in the imaginary of the customers. The generators are located in the middle of Kakuma 1 market behind closed doors (it is not visible from when standing in the market). However, despite some of the risks associated with the space outlined above, customers of this supplier seem to be un-linked to both the physical space where the generation occurs as even when customers visit the shop they are met in the front end of the 'shop' and do not enter in the back rooms where the generation occurs. The wires coming from the generators physically connect the spaces, but people seem almost unaware of them. Energy is truly 'underneath' perceptions and 'above' people's heads. The mini-grid owners and their representatives also act as a very positive personal interface which reassures customers both about the reliability of supply and the costs.

On Cooking Culture: Consumption and Innovation

Cooking in the camp is largely undertaken by women in the households. Fuels come from a range of sources: firewood, charcoal, and briquettes. There are a few types of stoves visible in the camp as well, from self-made cookstoves, to the Lokado stoves, to the Stove 80 and Wonderbox distributed stoves, to three stone fires. While we did not see much variation in consumption of different fuels or cookstoves, there were considerable examples of innovation in consumption modes and cooking cultures. For example, many women were happy to talk us through their recipes and adaptations in cooking methods: one example is included below for the recipe from Sudanese Kisra flat bread.

For example, we observed an innovative practice whereby a food additive was created from ashes and water. Ash was added to the boiling water, and drastically reduced the cooking time for tough beans. Some of the households interviewed stated that they did not choose the Briquettes from Sanivation because they could not use their ashes to reduce the cooking time and save fuel. We also interviewed a Congolese woman that spends hours cleaning her pots to remove the 'shameful' soot produced by firewood, who therefore prefers charcoal.

Recipe: How to make Kisra as Informed by Pascal

Ingredients:

- Ngeme - Wheat Flour
- Bulga - Sorghum Flour
- Oil
- Water

Utensils:

- Doka - Pan
- Jejeriba - Sort of handle to spread

Method:

1. In a bowl, prepare dough using sorghum flour and let it stay overnight.
2. In the following day add water and wheat flour to the dough and make porridge like solutions and leave it in the sun.
3. After another hour prepare fire

Pascal informs us that back in Sudan she used dried grass as fuel since Kisra does not need intense heat. But in this case she uses charcoal. But only places a few in the cookstove as a measure of controlling the intensity of the heat.

4. Place the Doka on fire
5. After a while, Sprinkle some water on the Doka to determine if it has heat up. A sizzling sound will indicate that the Doka is ready.
6. Slowly pour the porridge like solution of the doka and spread it using the jejeriba
7. Let it cook for a few moments till it solidify into a sort of bread
8. Turn the bread the other side and after a while remove it from the Doka
9. Serve with meat sauce, or vegetables.
10. Enjoy

In terms of innovation, this ranged from basic forms such as self-made cook stoves such as the ones seen in the Sudanese household which use both charcoal and firewood, to unusual and elaborate cooking solutions such as the multi-layered cookstove constructions. We also witness restaurant cooking using innovative methods, such as hands-free lighting solutions and industrial scale cooking for the NRC students using multiple cookstoves to cook different foods.



Picture: Using a torch, fixed on the head, to look inside the dark oven

Integrated Energy Economies: Cross-cutting Experiences of Energy

The three longer stories below represent examples of integrated energy economies within Kakuma camps. While understandings of consumption, technologies, and exchanges are present in most of the data we collected, it is possible to see manifestly complex interactions in some of the core elements of life within the camp. For example, in firewood collection, refugee and host energy interactions, and exchanges of food for fuel.

Follow the Firewood

Firewood is the most common cooking fuel in Kakuma refugee camp. We analysed how it gets to the refugees and the dynamics, complexities and interactions that underpin its movement from the source to the stove. Through a local implementing agency called LOKADO, UNHCR provides firewood to the refugees, but this process is not as linear as is depicted in this statement. The process begins with a registry called a manifest, which is a list of all refugees in the camp. LOKADO uses this manifest to determine the amount of firewood needed and after which will issue a tender to be supplied with the firewood. The tender is restricted to contractors of Turkana origin and the reason being that firewood is a resource drawn from their community land and therefore they are the only ones who qualify to benefit from its sale. The tender specifies the number of firewood bundles since upon delivery, refugees collect the firewood in bundles. Each refugee qualifies to get a bundle of firewood, and normally to standardize the process the minimum weight for each bundle is 10kg. So upon delivery of the firewood, LOKADO samples some bundles and weighs them to ascertain the weight.

To cater to everyone, there are Firewood distribution centres located in every camp which is divided into 5 major sections namely Kakuma 1-4 and Kalobeyei. So when delivering firewood, the lorries carrying the firewood will visit each firewood distribution centre and unload the bundles. Upon receiving the bundles, LOKADO arranges them in piles in preparation for

collection from refugees. Firewood collection by refugees takes place every 6-8 weeks and is a systematic process involving clustering families as per their sizes. As indicated above, everyone in the camp qualifies to get a bundle of firewood, however in most cases they are in family units and subsequently not everyone in the family will go to collect the firewood. So because in the camps individuals are grouped into families, then firewood collection is structured around this. Normally an individual is family size one, and if at the time of registering he/she has a spouse and a child then they are classified as family size 3, et cetra. The family size increases when children are born and after a baby is two weeks old they are added to the registry and recognized as an individual and the family size increases by a unit. Collection is designed to take place within a week and different family sizes are assigned different days of the week. So family size one and two would probably be assigned a specific day, same for family size four and five, etc. The largest family size ever recorded in the camp is eighteen and included extended family members such as grandmother and grandfather; A common scenario with big family sizes.

Despite the day's allocation, firewood collection is a busy affair. It is common to find unwinding queues. Given the high temperatures that are characteristic of Kakuma, it becomes unbearable for anyone to stand in the sun. To address this, the firewood distribution centres are designed to have shade structures that shelter refugees from the blazing heat as they stand in the queues to be served. When we point out this observation to a LOKADO official, he replied that "it is a matter of respect". So to collect firewood, a refugee has to present his card to the clerk, who confirms the family size and then checks the identification number in the manifest. Once the clerk confirms this, he crosses out the number on the manifest and gives back the card to the refugees who then proceed to the collection point and picks bundle(s) as per their family size and then proceed to exit gate. We noticed that females do most of the collection even though it is common to also find men collecting firewood. We were informed by interviewees that in most cases men who are family size 1 do their own collection. In instances when one is not able to collect firewood because maybe because they are sick then a neighbour can also go and collect their firewood.

When picking the firewood from the centre, we observe that most refugees select the "best" bundles from a heap of firewood bundles because they can tell by looking that some bundles have more firewood sticks or better looking sticks. We witnessed scuffles during this process since some refugees would argue over the ownership of a bundle of firewood that one had selected and put aside and while going to select another bundle, another refugee would come and "select" the bundle that the previous refugee had selected. Upon collecting firewood, refugees use different forms of transport to take back the firewood to their homes, some will carry the bundles on their head (women), others will hire a Turkana lady to assist with some bundles for exchange with food rations, while others will use wheelbarrows. Still some will hire a motor cycle, and in most cases these are the ones who live far off the centres. The firewood centres are located within the camp settlements, and in the case of Kakuma 1 there are two centres and therefore there are six firewood collection centres in total. Usually a refugee would be registered to firewood centres in the area they were resettled in. Some refugees

therefore walk very short distances to collect firewood. However this is not the case for the majority of the refugees given the vastness of the camp. A majority of refugees still walk long distances from their households to the firewood distribution centre. We witnessed extreme cases of this scenario for refugees who had been settled in Kalobeyei (the newest camp). Where those in zone 3 had to traverse to zone 1 where the firewood distribution centre in that camp is located to collect firewood. In another scenario we noted that despite being settled in a particular settlement a refugee would move for various reasons such as wanting to be live with relatives, and since these moves are usually not official, it means that to collect firewood the said refugee would still have to go to the registered firewood distribution for collection, and for most the total distance covered would be a day's journey.

Rose's Firewood Story

Rose has been living in the camp since 2011 and has been settled in Kakuma 1 camp, which also happens to be the most developed of the five camps. She collects her firewood from the Kakuma 1 firewood distribution centre which is at a fare distance from her home. Early this year, her mother ran away from South Sudan owing to the renewed fighting which according to her was the worst she has ever seen and so fearing for her life, she yielded to Rose's please of relocating to Kenya. Upon joining the camp she was registered as family size 1 and relocated to Kalobeyei which is about 30Km from Kakuma 1. Upon learning that her mother had travelled to Kenya, Rose travelled to Kalobeyei and was reunited with her mum. They discussed and agreed that it would be best her mother moves in with her so that she can cater to her as opposed to living in Kalobeyei on her own. This was not an official move and therefore Rose mentioned that she travels to Kalobeyei to collect a bundle of firewood for her mum, a task which takes a whole day. When we enquired why they bother to walk such a long distance for a bundle of firewood, they mention that when one fails to collect firewood for three consecutive sessions, they are deregistered and details are removed from the manifest, and would therefore not be able to collect firewood again. A risk they are not willing to take since firewood is such a rare and expensive commodity.

We also learnt that there are few refugees who are able to afford other forms of fuel such as charcoal and therefore don't need the firewood. However, since they are still on the list to receive firewood; they send someone in their place to collect the firewood. This is because they do not want to be deregistered from the manifest. The majority, however, cannot afford this luxury. In fact almost all the households we visited complained that the firewood rations are insufficient and don't last beyond a week. When asked what they do when the firewood runs out, majority responded that they exchange their food rations for charcoal while those who don't have food rations to trade, opt to forage for sticks. Incidences of gender based violence have been reported by women from the poorest households who don't have the capacity to

pay for their fuels and therefore forage for firewood. It is worthwhile to note that UNHCR and LOKARDO reported number of GBV incidence rates have declined significantly which partly can be attributed to the firewood distribution centres but those who venture into the host community land in search of firewood risk being assaulted.

Despite fuel scarcity we noted that there are social controls in the households and it was common to walk into a compound to find firewood lying on the ground and there seemed to be no concern that someone would steal the firewood. In another case, we walked to the NRC centre, a vocational training centre, and noticed that behind the classrooms there were heaps of firewood delivered by LOKADO, and again there seemed not to be a concern that these might get stolen.

Different ethnic groups have different ways they prepare food. Nonetheless we noted a common pattern where after cooking using firewood most cooking pots would be having soot. To address these different groups would adopt different measures such as spending hours scrubbing the pots clean or in other cases, coating the pots with an mud like paste made from ash which upon cooking the pot would be rinsed in water to wash it off and the soot settled on it.

Host and Refugee Relations – a forced dependency or a mutually beneficial relationship

Kakuma Camp was established on rough terrain, on land that was deemed unsuitable for agriculture and thus uninhabitable by many. But there is a group of people who does live here, and has lived for generations. The tribe known as the Turkana has owned these lands, living in traditional shelters the Turkana move around Northern Kenya with their livestock consisting of goats and sheep. It is a tough life. Rain is scarce and resources such as clean water, food and sanitation are even scarcer. The Turkana have been described as Kenya's proudest people. They fiercely protect their traditional way of living, which includes their own language and the rejection of outside influences such as the formal education system. In Kenya, the Turkana tribe has the highest rates of poverty and the lowest rates of literacy of all tribes.

The decision to build a refugee camp in Kakuma County went largely over the heads of the Turkana people. The national government, the county government and the Refugee Agency of the United Nations spearheaded this decision, and thus the camp was set up in 1992. Now, 25 years later, the camp has grown to a semi-permanent ever-growing settlement with roughly 200,000 inhabitants by the end of the year. These days, the Turkana are heavily ingrained in the economy of the camp. The Turkana can move around freely in- and outside of the camp, and

are instantly recognizable by their traditional wear. While the refugees hardly ever wear traditional garments, a notable exception to these being Congolese women who sometimes wear dresses made from traditional Congolese cloths. The host-refugee economy is completely intertwined and mutually dependent. As the Turkana own the lands around the camp, they have set up a lively business supplying firewood and charcoal from these lands to the camp. The Turkana can either sell bags of firewood and charcoal to the refugees themselves, or the lucky few that can obtain a tender from the UNHCR are able to supply large quantities of firewood to the firewood centers in the camp.



Picture: Transporting firewood to the firewood centres

The business of obtaining firewood is heavily protected by the Turkana. For safety reasons, the refugees are not allowed to forage for firewood by the UNHCR. But there is a subsection of refugees that feels like they have no other option. We talked to a young Somali mother who said; “I go out to forage for firewood when my firewood ration runs out. I just do not have the money to buy extra firewood. It is just me and my son, so the little food and money that I have I am providing for us. I go with my friends, all Somali women, and we move in groups outside of the camp. This is for protection. I am very scared of the Turkana people out there. My friend was attacked and beaten severely. If they catch you they will rape you!”. While this is anecdotal evidence, it does show a narrative prevalent in the camp regarding gender-based violence.

There are no comprehensive statistics available on gender-based violence and other attacks around Kakuma Camp. The fact that foraging is illegal is a big hindrance to the reporting, as well as the shame surrounding Gender Based Violence. But the tension surrounding this topic can be felt in the camp. A tension that we as researchers felt strongly during one incident in Kakuma 1. While we were doing household visits, we heard gunshots. News travels nowhere faster, than in a densely populated refugee camp so we found out within seconds that the Somali refugee community was attacking the Turkana near the market. A Somali girl was attacked and raped the previous day, and this was revenge. A few people were severely injured and one Turkana man succumbed to his injuries. The Turkana men were grouped together and about to retaliate, when the Kenyan police intervened and dispersed the groups. The gunshots we heard were from the Kenyan police. This incident is very telling for the clear tensions between the refugee and host communities.

Besides these tensions, both the refugee and the host community need each other to survive. Besides providing all firewood, the Turkana women are also available for odd jobs. We have witnessed Turkana women being used as a means of transport on Firewood Collection Day, and we have heard about Turkana women cleaning homes of the refugees and doing their wash. To enhance integration and lessen the existing tension there is a compulsory mix of host-refugee labour within the camp. The UNHCR wants the majority (70%) of all beneficiaries to benefit from the activities and employment opportunities in the camp, but leaves room for the host community to benefit.

In a way the presence of the refugees is a double edged sword; it provides the host community with employment opportunities, but it also brings the value of their work down. Refugees cannot earn a salary per Kenyan law, and thus the refugees work for stipends of maximum 6000 KES (60 Dollars) per month. The host community will receive roughly the same payment for their work, bringing the actual monetary value of their work down. It is hard to compete with 100.000+ able bodied people who cannot earn salaries. When we visited the Firewood Centre, we found out that everybody except the clerk works for a stipend. It can be stated that while the Turkana and the refugees interact on a day-to-day basis, and live and work in the same areas, they have very different lived experiences. The refugees have free access to multiple resources such as healthcare, food, education, clean water and sanitation. The Turkana that live outside the camp, do not have access to any of these resources for free. It is a harsh reality to have such valuable resources, such as clean water from a borehole, in your land but inaccessible to you.

Donors have picked up on the disparity between host and refugee communities, and have implemented quotas for employment and for the beneficiaries of projects. There is for example a quota for 40% of the host populations to receive skills training at the NRC Youth Centre. This quota is however never met, as one NRC employee tells us: “we offer the trainings to them. You want to do welding? Come! You want to do woodwork or mechanical engineering? Come! But they do not come, no one of the Turkana does. They find these trainings demeaning and they also do not want to mix with the refugees”. Another skills training organizer, Swiss Contact, has stumbled upon the same difficulties and has thus decided to hold separate classes for refugees and for the Turkana. “Separation is best” one employee tells us. “The groups can speak their own language and learn in their own tempo. There are no tensions when both groups are separate”. Another option to fill the quota is to look at the definition of host community in the broadest sense. In that way every Kenyan is part of the host community. In town and in the camp one will see the jobs being filled by Kenyans who are not Turkana. One example of this is the repair work being done for the UNHCR. When their tools, like wheelbarrows, break they will be repaired in Kakuma Town by the host community. These welders are Kenyan, but they are not Turkana.

The Turkana are mostly trying to provide for their most basic necessities, in their own traditional ways. The barter trade between the host and refugee communities is the biggest

form of trade. The Turkana walk around the camp with bags of charcoal or firewood on their heads. The refugees spot them and invite them to trade their food for fuel. There is no set price and the refugees and Turkana negotiate until both parties are happy. We saw a barter trade between the Turkana and a set of refugees whereby the negotiation and following trade took up to 45 minutes to complete. The refugees said that the charcoal pieces being offered were too small, and the Turkana told them that the food bowls were not filled adequately filled with sorghum. In the end, all agreed on the quantities and the trade could take place. A small interaction between members of two communities that coexist but do not merge in terms of cultural practices.



Picture: Trading sorghum for charcoal

On the linkages between food and fuel

On the hot and busy grounds of Kakuma Refugee Camp life consists of a few certainties: the days are hot, time is plenty and the food vouchers will come. The people that call Kakuma Camp their home live in one of the four numbered zones in the camp; Kakuma 1, 2, 3 and 4 stretch out over more than 30KM of flat terrain and harbour approximately 180,000 refugees from East and Central Africa.

The first step to calling Kakuma a home is registration. The new arrivals have to report to the UNHCR office where a living space is allocated to them along with a food ration card and a firewood collection card. These cards hold the location in the camp where the recipient is to pick up food and firewood, as well as the household size that the recipient belongs to. The bigger the household, the more food and firewood the recipient will get. Food and firewood are central to the livelihoods of the inhabitants of Kakuma Camp as contact between the refugees and the refugee agencies revolve around the exchange of these two items. Food and firewood are thus simultaneously widely accessible and highly valuable items in the everyday life of the refugees. The refugees pick up their firewood bundles from the Firewood Center every two months while food exchange happens every month, both through distribution and through electronic food vouchers.

But as with any system, flaws will occur. “The food vouchers are always late” a South Sudanese woman tells us. “Sometimes they are two weeks late! Are they expecting us to not eat for two weeks?!”. We feel her indignation. “But we find a way, now we get the food from the vendors

and pay them when the vouchers arrive. So we find a way”. This too is life in Kakuma Camp; being creative in feeding yourself and your family within the limits of the system. The electronic food vouchers are a cash credit system run by the World Food Program (WFP). The recipient is eligible to receive this extra allowance, after they have picked their food ration from the distribution point. When the official food distribution ends, the electronic details of the beneficiaries are downloaded and verified. Once everyone’s details are processed, the cash is transferred to the sim card of the recipient, a process that can take anywhere from two to four weeks. And thus the food vouchers are routinely late, a fact that the food vendors are well aware of. But instead of this fact hindering their business the food vendors will still give out the food, while writing down the details of the recipient meticulously. Then when the food vouchers finally arrive, the debt shall be repaid. This informal food-credit system works seamlessly alongside the formal food distribution system of the refugee agencies, whereby staples such as maize flour and sorghum is distributed according to family size.

Every month, there is food distribution week in the camp. The week is divided by family size, with the big family’s being served on Monday and the smallest family sizes on Thursday or Friday. A member of each household will go on the destined day to the distribution point to pick up their rations. Each member of the household will get the same amount of food, no matter gender or age. So when a family consisting of 4 people gets 4kg of sorghum, a family of 8 will get 8kg. “Having a child is a blessing” a young mother tells us while waiting in line for the food distribution. “Here they count your child as a family member when he is 2 weeks old. Our family size grew from 9 to 10 and my sister will have a baby soon as well. It makes a big difference in our food rations and it is truly a blessing”. The line shuffles slowly to the front as everyone awaits their turn for food. There is a biometric scanner which registers the fingerprint of the recipient to ensure that no beneficiary can pick up food with a stolen food ration card. If the fingerprints do not match, an iris scan is performed to verify that the cardholder is the rightful recipient of these rations. In theory, living in Kakuma means never living without food.

But that is theory. In practice, there are always those that go without. As with all systems there are those who benefit more, and those who benefit the least. In Kakuma the more fortunate are those living in larger family sizes. As preparing porridge in a big pot takes relatively the same amount of firewood as preparing porridge in a small pot, when both pots use the same clay stove. And as the bundles of wood are given per family size it is the larger family sizes that will get more value for firewood. The consequences of family sizes becomes apparent when visiting an Ethiopian family in the oldest part of Kakuma Camp. We are welcomed inside by a forty year old man. His house seems larger from the outside than from the inside but the shade is a welcome break from the hot surroundings. There are several mattresses covering the floor and lying on them are a 65 year old man and a 2 year old boy. Three generations living together far from their original home.

Cooking and Displacement: An Ethiopian’s story

“We used to be a family size 7 and life was good” the man explains. “It is me, my wife, my father, my son and I have three daughters. My daughters got the chance to relocate to Amerika” he states proudly. “we are going to follow. It took years for my paperwork to be in order. Now that I have everything arranged, Amerika has stopped my process. Nobody can tell me anything, the UNHCR does not know if I can join my daughters. So we are here, waiting”. The old man in the corner shifts on his mattress, he is restless. “And now we have a problem with both food and firewood. When we were a family size 7, we got 7 bundles of firewood and 7 portions of food. It was not plenty, but we could manage. We cooked twice a day. Now that we are a family size 4, the firewood runs out. We can never make it two months. We need to spend money to buy extra firewood and charcoal. Everything has changed”.



At the Firewood Center the process seems quicker than at the Food Distribution Center. Here, there is no biometric security, the recipient just has to wait in line and show their firewood distribution card at the counter when it is their turn. Numbers from 1-34 are displayed on the edge of the card, symbolising the consecutive distributions. A hole is punched in the card, after which the recipient can enter the enclosed space and receive the bundles.

Picture: Outside the home of the Ethiopian man



Picture left: A firewood distribution card with punched holes. Picture right: The bundles of firewood laying ready to be picked up at Firewood Centre 2.

All inhabitants of Kakuma Camp have to pick up their firewood bundles from their designated Firewood Centre. There are 6 Firewood Centres spread out over Kakuma and Kalobeyei, and the centre that the recipient is registered at after arrival is the firewood pick-up point for the duration of their stay in Kakuma Camp. This means that when a recipient is allocated to Kakuma 2 after arriving to the camp, registration will take place at Firewood centre 2. Which means that when moving homes within the camp, for example to join forces and become a larger family size, the recipient cannot move Firewood Centres. It can thus happen that someone who is now living in Kakuma 4 will still have to get their firewood from Kakuma 2, some 20KM further away. Here one can see a sharp difference arise between those with and without means. The poor walk, however long they have to, to collect their firewood from the centres. While the more affluent families can afford to send someone to pick up their firewood by wheelbarrow or bike and deliver it to their doorstep.

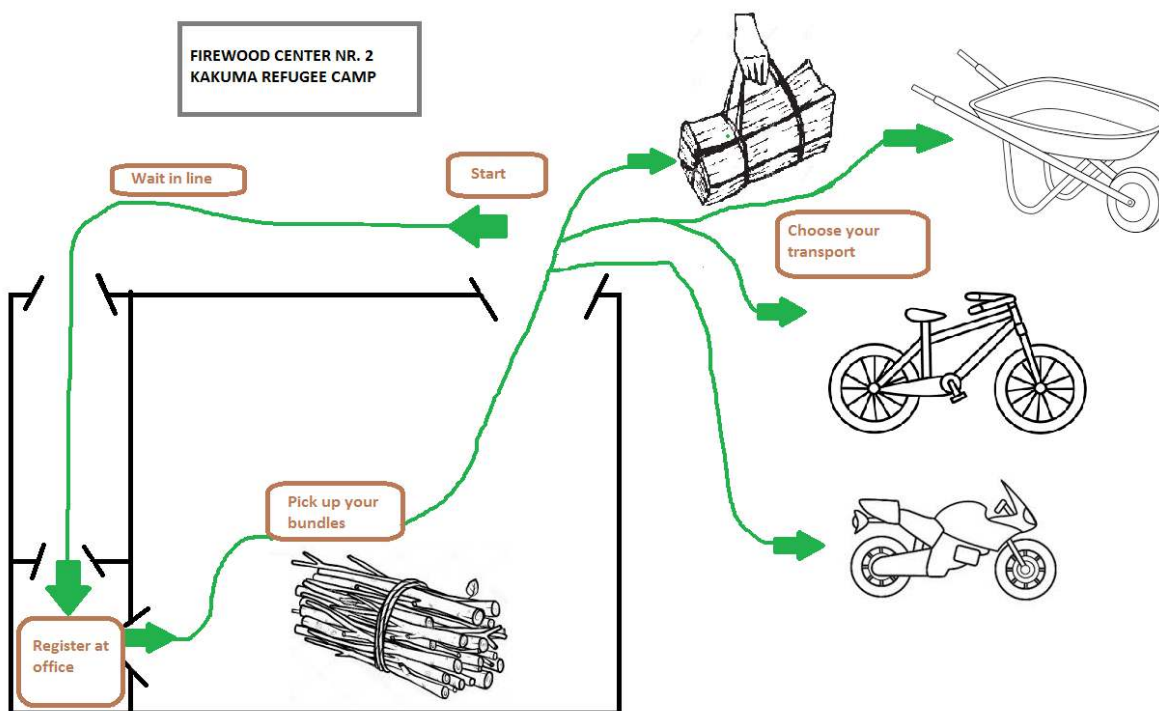


Diagram: The route taken by the recipient to obtain there firewood bundle(s).



Picture: Transporting wood outside the Firewood centre

When firewood runs out there is the option to buy more from the Kenyan host community, the Turkana, who gather wood from their lands and sell the bundles in the camp. The Turkana also sell charcoal, but when paying cash charcoal is more expensive and thus a less favourable option. But in Kakuma Camps inhabitants have found another way to pay, whereby the food they receive through distribution or vouchers is traded for fuel. And strange enough, when trading food for fuel, one will get more charcoal than firewood. So in the food-fuel exchange economy, charcoal is the preferred choice. And in the more formal cash-fuel exchange economy, firewood is the more obvious choice. A South-Sudanese woman told us: “we always run out of firewood, how can we last two months with 5 bundles?! This is impossible. The Turkana are walking around selling charcoal. I trade three bowls of sorghum for one basin of charcoal. It is a good deal”. This woman receives five bundles of wood because her family consists of five people. She cooks three times a day and one bundle lasts her family two days. Which means that the distributed firewood will last this family just ten days. The remaining fifty days this South-Sudanese family has to trade in part of their food portion to fuel, in this case charcoal.



Picture: "Three bowls of sorghum....

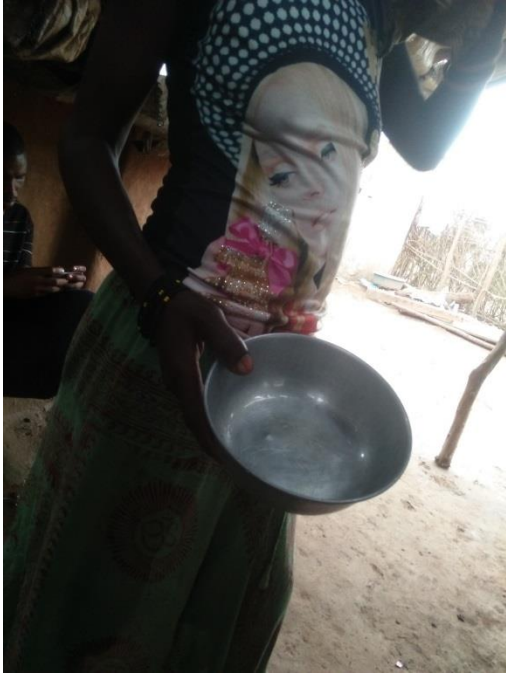
.....for one basin of charcoal"

Food and fuel are undoubtedly interlinked in Kakuma Camp. When a beneficiary runs low on firewood, they will not have the possibility of preparing enough food. And when this beneficiary exchanges a portion of their food for fuel, they will again not be able to prepare enough food. It is a cycle that hits those that cannot mitigate these adverse effects the hardest. The poorest people in Kakuma Camp, are in real danger of lacking food. As another South Sudanese woman told us: "We now cook once a day. I just do not have the food to prepare more. I need firewood to keep my child warm in the colder months. In the northern part of Kenya the coldest months are July and August, and the temperature generally does not drop below 24 degrees Celsius. In the warmer months the temperature hovers above 40 degrees Celsius. But one must not forget that a large portion of the inhabitants in Kakuma Camp have their origins in places like Sudan and Somalia, which are much hotter all year round. So a family burning precious firewood to keep their child warm, is a family that prioritises protection for their child over food for themselves.



Picture: "We now cook once a day"

Obtaining energy in the camp costs time. Trading food for fuel is not a simple transaction. Turkana women are walking through the neighbourhoods with charcoal on their heads. When a refugee is willing to trade their rations for charcoal, the ladies are called to the compound. Then the bartering starts. The Turkana women will want the as much food as possible for their charcoal, and they also have a preference for types of food. Porridge and beans and peas are the preferred staples, and Sorghum is the least popular food for trade. But both parties are dependent on which food has been distributed this month. The refugees barter for the quality of charcoal. The quantity is always one basin, but the quality of charcoal differs whereby the bigger pieces are preferred. We witnessed a barter trade whereby a Congolese woman traded 3 bowls of sorghum and 1 bowl of yellow peas against 1 basin of charcoal. The bowl used are part of the welcome package for refugees, and have grown to be the standardized measuring item for barter trade. The entire transaction took 45 minutes, and the Turkana women had walked for 3 hours before this transaction took place as they do not live near to the camp.



Picture: The standard measuring size for barter trade.

But also for the refugees living in the camp, obtaining food and fuel costs a lot of time. In the biggest food market in Kakuma Camp, the Ethiopian Market, we observed beneficiaries with electronic vouchers waiting to shop. The electronic voucher comes in the form of a simcard. The shopkeeper has to verify the amount on the card by inserting the simcard in his phone and using the USSD connection to connect to the World Food Programs automatic response system. This system verifies the recipient by requesting a PIN number, and transfers the chosen amount from the simcard to the shopkeepers electronic account. This process takes about 5-10 minutes per customer, so the waiting times can add up. Because of these long waiting times and because nearly all shops sell the same products, the shopkeepers have to give out incentives to attract customers. A great example of this is the owner of the largest supermarket in Kakuma, and self-proclaimed richest man in the camp, who sends a car to pick up his customers in the furthest areas of the camp. His customers are driven about 30km to his store, and brought back with their purchased goods. Other shopkeepers are not in the position to do this, but will offer a free soft drink or cold water for their waiting customers, a welcome refreshment in the Kakuma heat.

We observed the majority of the customers in the shops buying items with cash, which they overwhelmingly received through remittances. With cash, the recipient can buy any item on sale. But with the electronic vouchers it is strictly forbidden to buy anything other than food items. We did hear people in the camp talking about how some traders will take the electronic vouchers and exchange them for fuels such as charcoal, these traders will ring up a food item in the store to mask this transaction. The World Food Program strictly forbids these transactions, and has enlisted the help of local people in the camp to catch these traders in the act. It is for this reason that when we asked shopkeepers in the Ethiopian Market about the practice, they

all vehemently denied it. There was just one shopkeeper, a young man who was filling in for his father, who paused...looked around, leaned in and whispered: “yeah, maybe. But only if my father agrees. We can make a deal”.

We have witnessed that in Kakuma Camp it is a guarantee that your firewood will run out before the next distribution. This is a very dangerous option, but still one that many families have to choose. Foraging for firewood is a task done by women. When leaving the protection of the camp, these women are very vulnerable. We have seen people obtain extra fuel, both firewood and charcoal, through cash purchases, through the trade with food and in some instances through the use of their electronic food vouchers. But when all above methods are not feasible, there is also a fourth way to obtain firewood which is to leave the camp and forage the surroundings for dry wood. This is a very dangerous option, but still one that many families have to choose. Foraging for firewood is a task done by women. When leaving the protection of the camp, these women are very vulnerable. We were told a couple stories of abuse and Gender-Based Violence. One Somali woman said: “I have no option. I need the food and I need the wood. I do not have money to buy anything additional. We move in groups when we exit the camp, we will be attacked otherwise”. A South Sudanese woman recounted when one of her foraging experiences went wrong: “I was attacked. I ran away but they got me and they beat me severely”. According to the UNHCR the number of reported incidents has gone down drastically because of the introduction of the Firewood Centres in the camp. But it is to be noted that the explicitly stated illegality of foraging wood could be seen as a hindrance in reporting any incidents.

Food and fuel are intertwined in the refugee economy and play a central role in the day to day lives of the inhabitants of Kakuma. While every refugee receives the same quantities of these two high valued items, economies of scale ensure that there is a strong divide between the more and less fortunate. Firewood lasts a longer time when you the recipient is part of a larger family size. But eventually every recipient will run out of firewood before the next distribution. This is when food will be used in barter trade with the local host population. When the electronic food vouchers are late, the beneficiaries will get the food on credit and the food-fuel trade can continue. We are struck by the inventiveness and reach of this informal trading economy supplementing the existing donor distribution system. But while this system works for most, it is essential to not forget the most vulnerable among the refugees. There is a section of refugees who do not have the means or connections to supplement the traded food, and their only option to obtain more firewood is to put themselves in harm’s way and forage. In this thriving refugee economy, it is essential to focus on the most energy poor in Kakuma Camp, so they too will be able to “find a way” and access enough food and fuel to sustain their livelihoods.



Picture: A food for fuel transaction between members of the host community and refugees in Kakuma Refugee camp.

Conclusion and Discussion

This paper has presented an overview of the lived experience of refugees in Kakuma refugee camps in Kenya. Several themes, including technology, consumption and exchange, have been considered throughout this paper. We have covered several dimensions of the lived experience of energy access in situations of displacement can including, why people use energy: what are their priorities and perspectives; How people use energy: when is energy used and what for what purposes; What relationship is there for people between energy, food and fuel and their situating environment; What cultural preferences influence people's energy choices and priorities; How much does it cost households and businesses: people's own estimates of value and costs as well as market data and evidence on prices. Further examination of these issues will be considered in additional papers and reports produced by this project.

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