

# Innovating mobile solutions for refugees in East Africa

Desk review: Selection of refugee locations for further research



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SAMUEL HALL.



# Introduction

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Literature on the use of mobile technology for migration mostly focuses on migration into Europe, with little research conducted to assess the technology uses and needs of refugees traveling to, from and within East Africa.

Whilst refugees traveling from the Middle East rely on tools such as Facebook and Google Maps to support their journey to Europe, refugees traveling within Africa are much more limited in the technology they can use. Poor, or incomplete mobile connectivity across the region, lack of access to smartphones and low levels of technical literacy are all cited as core challenges.

Funded by the Humanitarian Innovation Fund (HIF) this study will take place in Kenya and Uganda, home to some 1.7 million refugees. Both countries are two of the largest refugee hosts in East Africa (alongside Ethiopia and Sudan) and positioned at the nexus of regional migration. This study will explore how refugees in Kenya and Uganda use technology to support migration, *during their journey and at arrival*, and to what extent current solutions meet their needs. The results will open the way for innovative solutions, uniquely tailored for refugees in East Africa.

As little is known about how refugees use mobile technology (or would benefit from it) this study will collect primary data through face-to-face surveys with refugee populations in Kenya and Uganda. Surveys will be conducted in two refugee settlements, one in each country, in addition to one urban centre. Based on an initial analysis of major refugee camps/settlements in each country, the following six locations have been shortlisted:

- In Kenya:
  - Nairobi (urban)
  - Kakuma
  - Dadaab
- In Uganda:
  - Kampala (urban)
  - Nakivale
  - Bidibidi

Refugees staying in urban locations are typically spread throughout the city and are often concentrated in certain neighbourhoods according to nationality.

In Kampala Somali refugees are mainly found in Kisenyi (also known as little Mogadishu), Ethiopian refugees in Kabalagala and Congolese in Katwa<sup>1</sup>. A similar settlement trend is also common in Nairobi where most Somali refugees reside in Eastleigh, an estate that is dominated by the Kenya-Somali community<sup>2</sup>. Other refugee locations in Nairobi include: Kayole, South B, South C, Kariakor, Ngara, Hurlingham, Satellite, Kangemi, Mlango Kubwa, Kayole, Komarock, Kasarani, Zimmerman and Ruiru<sup>3</sup>.

The primary focus of this desk review (part 1) is to facilitate the selection of up to three refugee locations where further research will be conducted, and provide a logical rationale for this.

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<sup>1</sup> Naohiko Omata and Josiah Kaplan, "Refugee Livelihoods in Kampala, Nakivale and Kyangwali Refugee Settlements Patterns of Engagement with the Private Sector," n.d.

<sup>2</sup> Refugees Deeply, "What We Can Learn From The 'Little Mogadishu' Migrant Hub," Refugees Deeply, 2017, <https://www.newsdeeply.com/refugees/articles/2017/01/06/what-we-can-learn-from-the-little-mogadishu-migrant-hub>.

<sup>3</sup> Sara Pavanello, Samir Elhawary, and Sara Pantuliano, "Hidden and Exposed: Urban Refugees in Nairobi, Kenya," 2010.

# Methodology

Seven evaluation criteria will be used to select the three refugee locations for further research based on a desk review of existing reports, articles and datasets. These criteria are grouped into two broad categories as defined in Table 1.

Table 1: Description of evaluation criteria used to select refugee settlements for further research

Criteria	Category 1: Demographics
1	<p><b>Population size:</b></p> <p>Larger refugee populations reflect a greater cross-section of people in need of support. This provides a wider potential user base that could increase the impact of mobile solutions developed.</p>
2	<p><b>Diversity:</b></p> <p>Population diversity amongst refugees provides an opportunity to explore the technology needs of different nationalities and the varying routes taken to reach camps, cities, or settlements.</p>
3	<p><b>Younger age categories:</b></p> <p>Research by the Pew Research Center in 2016 suggests that, globally, Millennials (ages 18-34) are more likely than older generations to own a smartphone and access the internet<sup>4</sup>. Furthermore, the use of mobile technology by children under 18 is completely undocumented and will be a major focus of this study.</p>
Criteria	Category 2: Infrastructure and technology
4	<p><b>Access to telephony and the internet: WIFI coverage:</b></p> <p>Reliable mobile phone signal coverage is essential for refugees wishing to make voice calls or send and receive text messages. 3G and 4G cellular network coverage also provides access to more sophisticated internet services and messaging applications such as WhatsApp.</p> <p>Alongside mobile phone signal coverage, WIFI is fundamental to high speed internet access, which in turn facilitates access to relevant mobile applications, and information through websites.</p>
5	<p><b>Mobile device ownership and access (penetration):</b></p> <p>Mobile devices (either owned or shared) provide the platform on which applications and services for refugees can be delivered. Greater access to mobiles translates to a larger potential impact and rate of adoption of services developed.</p>
6	<p><b>Access to energy:</b></p> <p>Regular access to electricity is fundamental to sustained use of mobile technology and many settlements use a range of approaches to generate energy to maintain a more regular supply. Several sources of energy are therefore considered across locations, including access to off-grid solar and on-grid (mains) electricity.</p>
7	<p><b>Establishment refugee settlement or community</b></p> <p>Assumption: Older settlements have had longer to establish essential infrastructures capable of delivering services such as electricity and water. Residents and humanitarian providers have also had greater time to build skills and experiences that can maximise the use of such resources. Older settlements may therefore benefit more strongly from services delivered through mobile technology.</p>

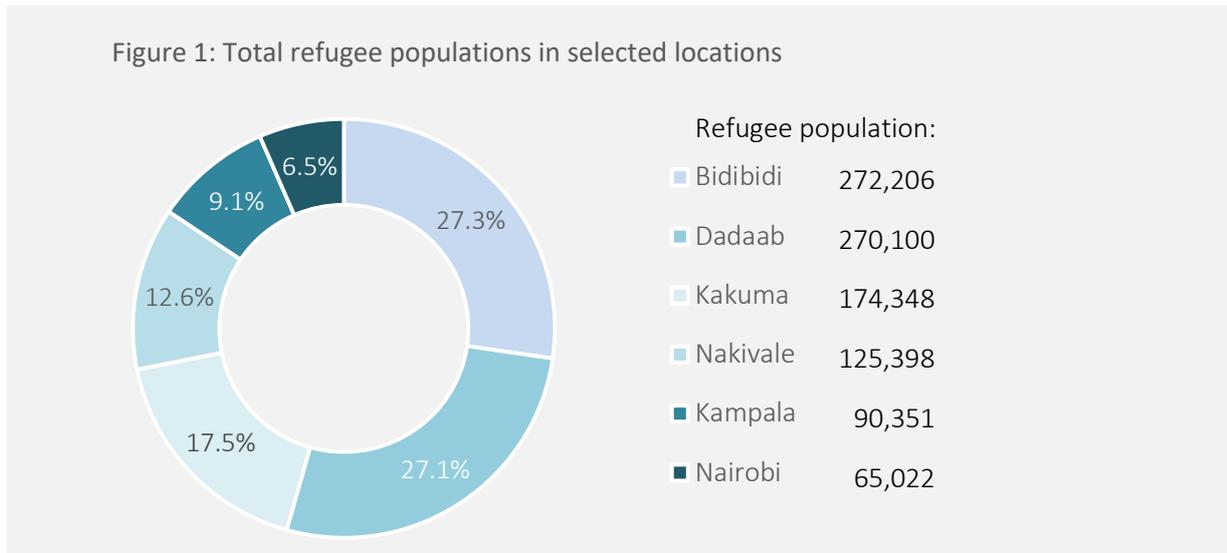
<sup>4</sup> Pew Research Center (2016), Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies

# Findings

## CATEGORY 1: DEMOGRAPHICS

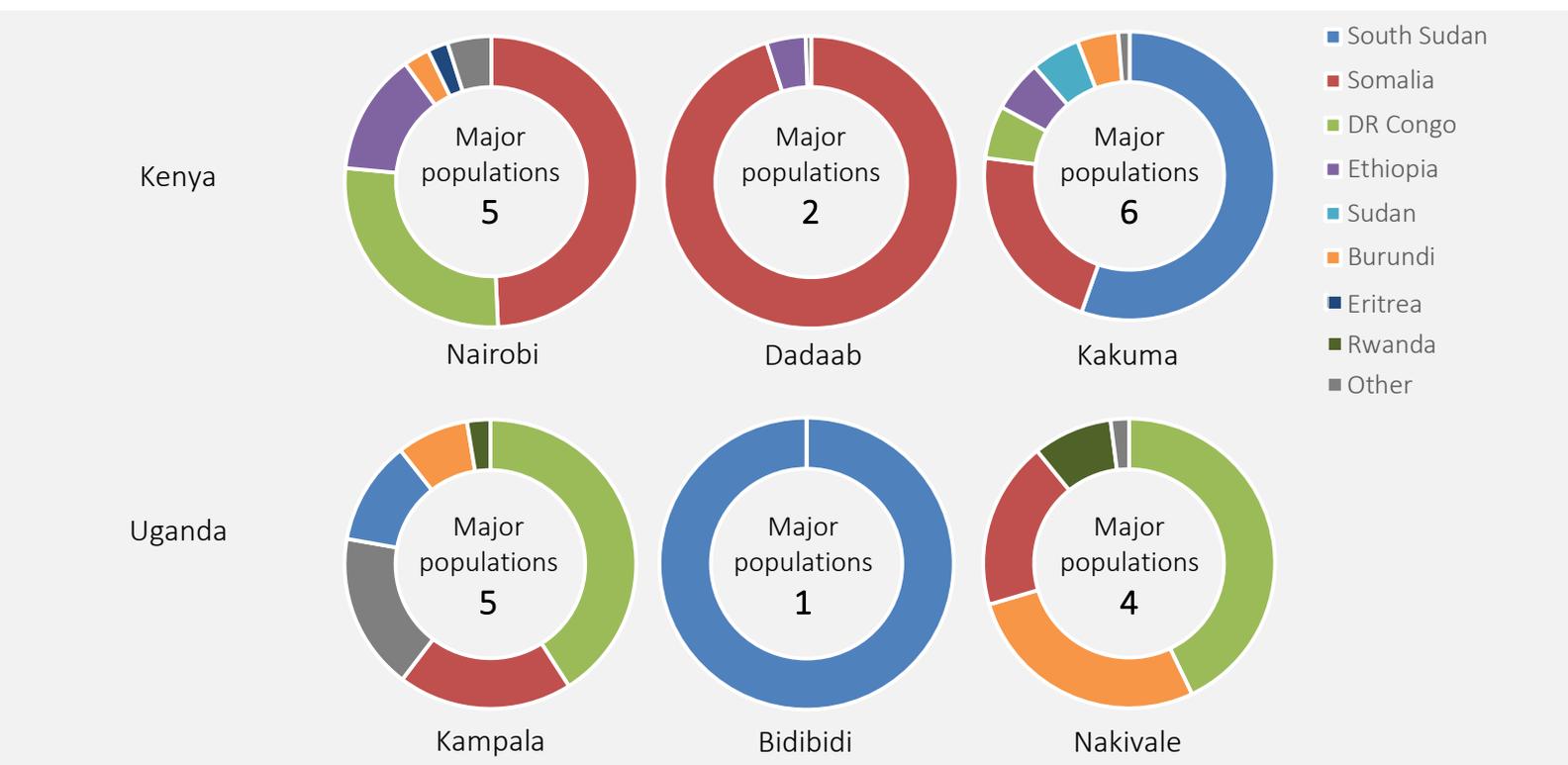
### CRITERIA 1: POPULATION SIZE

There are approximately **997,425 refugees** settled across the six locations considered in this Study. **Bidibidi** and **Dadaab** each house around 270,000 refugees. This constitutes just over 54% of the total refugee population across all six settlements.



### CRITERIA 2: DIVERSITY OF REFUGEE POPULATIONS

Figure 2: Diversity of major refugee populations (nationalities) by location



**Kakuma, Nairobi and Kampala** contain the most diverse set of refugee populations. While both Nairobi and Kampala are capital cities (in part explaining their population diversity), Kakuma’s unique position close to the borders of Kenya, Ethiopia, South Sudan and Uganda may be a factor behind the settlements population diversity.

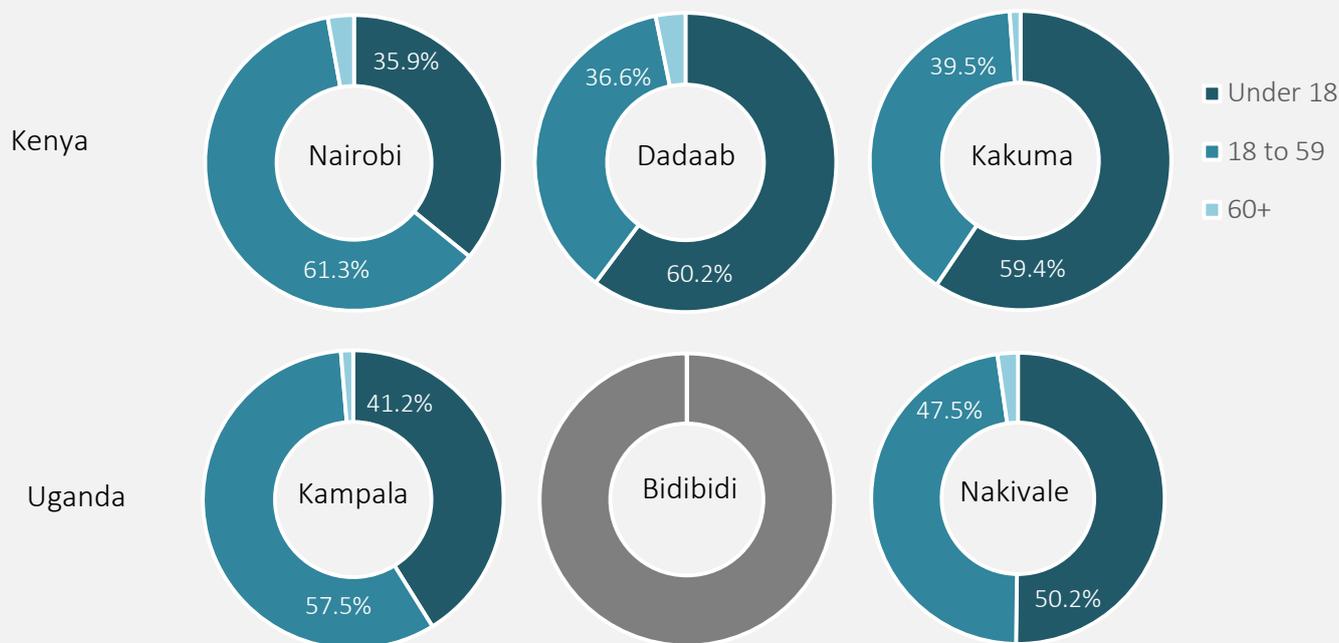
Bidibidi and Dadaab contain largely homogenous national groups – due to the recent (Bidibidi) and historic (Dadaab) inflows of refugees – as both settlements closely border South Sudan and Somalia respectively<sup>5</sup>.

### CRITERIA 3: YOUNGER AGE CATEGORIES

Over half of all refugees in **Dadaab, Kakuma** and **Nakivale** are children under the age of 18. The vast majority of refugees in all locations (over 95%) are under the age of sixty, with studies showing that most refugees are, in fact, under the age of 35.

We were unable to find verifiable information on the age categories of refugees in Bidibidi. However, recent reports from UNHCR indicate that the majority of the refugee population stemming from South Sudan (62%) is under the age of 18<sup>6</sup>.

Figure 3: Classification of refugee ages by location<sup>7</sup>



<sup>5</sup> Data sources for Table 1, Table 2 and Table 3 are as follows:

- Bidibidi: UNHCR, “Bidibidi Settlement, Yumbe UNHCR Operational Update,” 2016.
- Bidibidi: UNHCR, “UNHCR Uganda Factsheet,” 2017.
- Dadaab: “Dadaab Camp Population Statistics: By Country of Origin, Sex and Age Group,” 2017.
- Kakuma: UNHCR, “Kakuma Camp Population Statistics,” 2017.
- Nakivale: UNHCR, “Refugees and Asylum-Seekers in Uganda,” 2017.
- Nakivale: UNHCR, “Nakivale Refugee Factsheet,” 2014.
- Nairobi: RSC, “Refugee Economies in Kenya Preliminary Study in Nairobi and Kakuma Camp,” 2016.
- Kampala: UNHCR, “Refugees and Asylum-Seekers in Uganda,” 2017.
- Kampala: Alexander Betts, Louise Bloom, and Naohiko Omata, “Refugee Economies: Rethinking Population Assumptions,” 2014.

<sup>6</sup> UNHCR (2017) South Sudan Situation. Regional overview of population of concern as of 15 April 2017

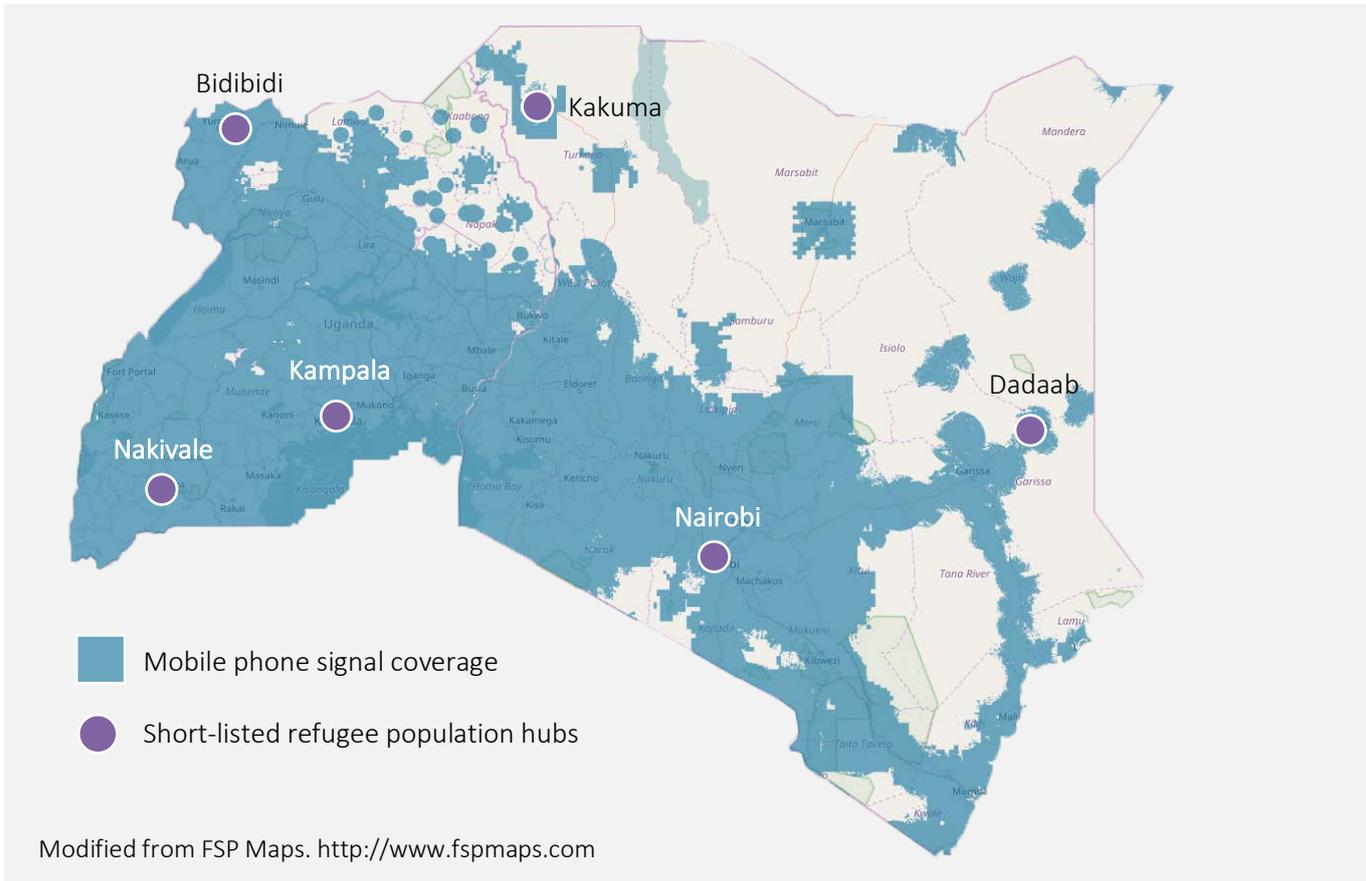
<sup>7</sup> Reliable date on Bidibidi refugee settlement is not available.

## CATEGORY 2: INFRASTRUCTURE AND TECHNOLOGY

### CRITERIA 4: ACCESS TO TELEPHONY AND THE INTERNET

As can be seen in Figure 4, signal coverage in Kenya is concentrated towards the centre and south-west of the country, with pockets of connectivity around Dadaab and Kakuma. Signal coverage in Uganda is more homogenous with good coverage across all refugee locations considered in this study.

Figure 4: Mobile phone signal coverage (2G, 3G, 4G) in Kenya and Uganda



Refugees or vulnerable migrants entering Uganda from Rwanda, DR Congo, South Sudan and Tanzania, will all have good signal coverage as they make their way into the country. However, refugees or vulnerable migrants entering Kenya from Ethiopia, Somalia or South Sudan will have much poorer mobile phone signal coverage, as they traverse the northern and eastern parts of the country. This will make receiving or sending texts or calls a challenge and access to the internet will be difficult.

Once settled, refugees and vulnerable migrants that have access to high-speed WIFI can overcome limitations in 2G and 3G/4G signal coverage and access digital services on mobile devices that might not otherwise be available through 2G, or poor 3G/4G connectivity.

#### DADAAB AND KAKUMA

Both Kakuma and Dadaab have aid agencies running projects that deliver reliable and cost-effective internet through high-speed WIFI. DadaabNet, for example, provides IT services and internet access to the refugee community in Dadaab, including refugee children, to enhance their education and vocational training<sup>8</sup>. High speed

<sup>8</sup> NetHope, "DadaabNet Project Report," 2014.

WIFI networks in Kakuma have enabled UNCHR and other organisations to promote technology based learning for children and adults in the settlements<sup>9</sup>.

#### NAKIVALE

To increase internet access in Nakivale, UNHCR have established a Community Technology Access Centre (CTAC) which provides internet access and IT services to the entire settlement<sup>10</sup>. Because of the relatively stable internet connection within the camp, several refugees now run cyber cafes for local refugees<sup>11</sup>.

#### NAIROBI AND KAMPALA

Nairobi and Kampala both have WIFI hotspots throughout the city, with mobile network operators (MNOs) and other telecoms operators providing relatively low cost access. Although we were unable to find evidence of WIFI access specifically for refugee communities, we have assumed that *potential* access is relatively high. This does not mean however that refugees are able to afford such services.

#### BIDIBIDI

As a new settlement, Bidibidi does not currently have widespread WIFI infrastructure in place.

Figure 5: Potential access to WIFI by refugee communities by location



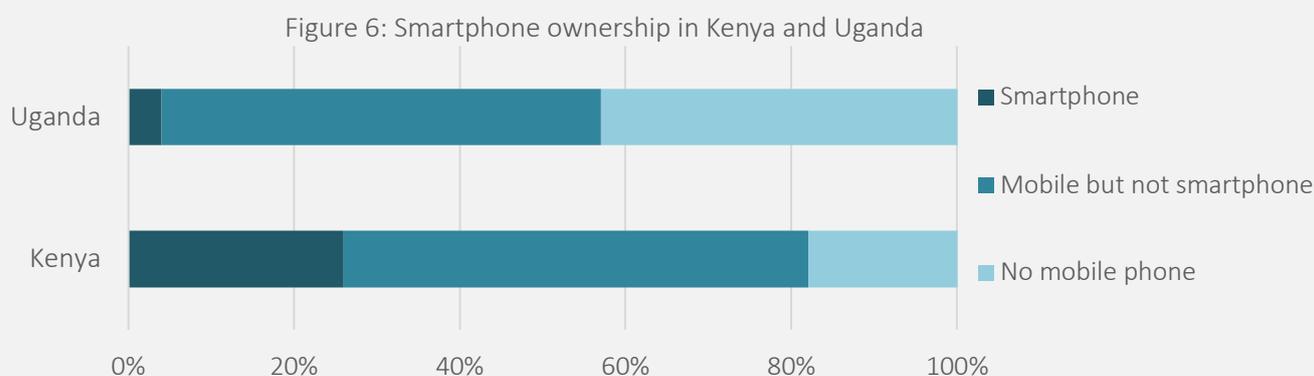
### CRITERIA 5: MOBILE DEVICE OWNERSHIP AND ACCESS

Access to digital services through o WIFI or 2G/3G/4G cellular coverage is only half the equation. Access to mobile devices which deliver such services is the other half.

We have placed mobile devices in to two categories that reflect notable differences in functionality:

- **Smartphones:** Able to run applications on platforms such as iOS and Android as well as access the internet
- **Mobile phones:** Able to make/receive calls and text messages. This also includes ‘feature phones’ which can access the internet and a limited number of mobile applications.

Mobile device ownership in Figure 6 is based on data provided by Pew Research<sup>12</sup>



<sup>9</sup> UNHCR, “UNHCR Innovation | Skype in the Classroom,” UNHCR Innovation, 2017, [http://www.unhcr.org/innovation/labs\\_post/skype-in-the-classroom/](http://www.unhcr.org/innovation/labs_post/skype-in-the-classroom/).

<sup>10</sup> Adham Sanaa, “Innovation and Refugee Camps: The Role of Innovation in Developing the Humanitarian System with Special Focus on,” 2015.

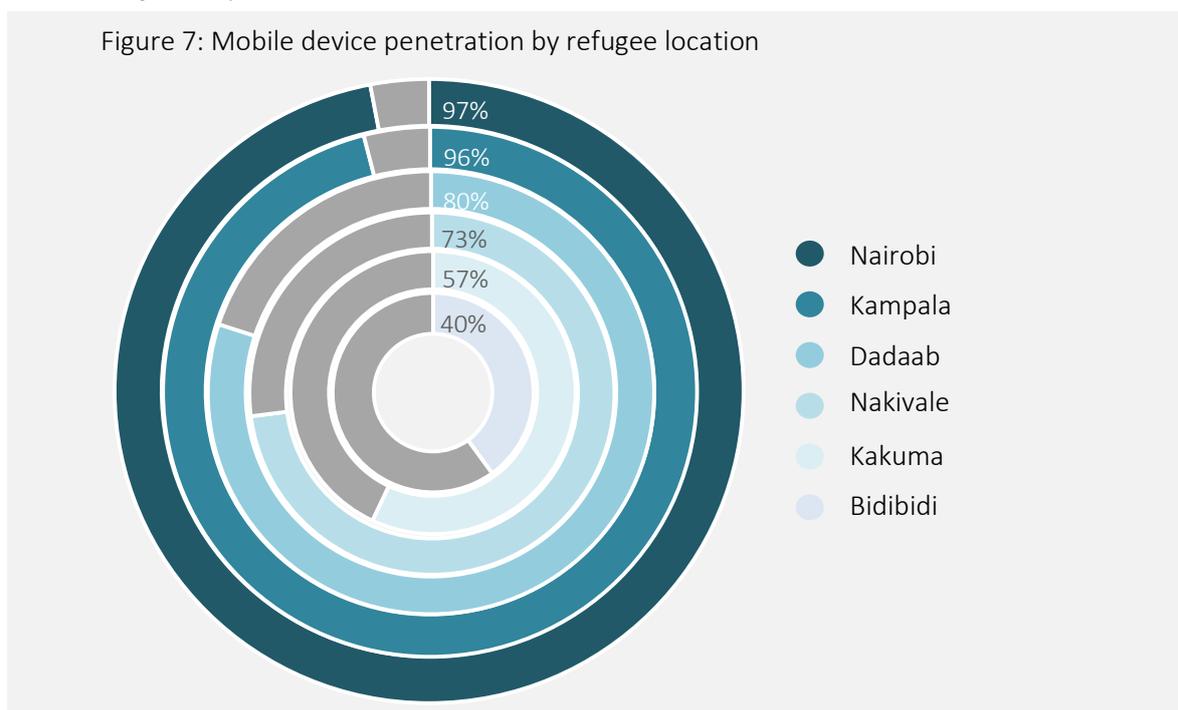
<sup>11</sup> Alexander Betts and Nina Weaver, “Refugee Innovation: Humanitarian Innovation Starts with Communities.,” 2015.

<sup>12</sup> Pew Research Center (2016), Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies

As can be seen from Figure 6 above, smartphone ownership in Kenya is over twice that of Uganda. Furthermore, overall mobile device ownership in Kenya stands at more than 80 percent, whereas over 40 percent of Ugandans do not own a mobile device.

These figures provide a good indicator of the prevalence of mobile devices in each country, which may also provide a benchmark for how easily refugees can access such devices, particularly in urban settings. This assumption can be tested by examining mobile device access/ownership in each refugee location. As shown in Figure 7, refugees in Nairobi and Kampala (both regional urban hubs) have high rates of mobile phone access, supporting our previous claim.

Mobile phone penetration seems to decrease away from urban centres. Although difficult to verify in the literature, the high number of refugees from South Sudan, present in both Bidibidi and Kampala may be a strong contributing factor to lower mobile phone access in both these locations. This is because, according to GSMA, mobile phone connections in South Sudan stand at just 31 percent<sup>13</sup>.



## CRITERIA 6: ACCESS TO ENERGY

### DADAAB AND KAKUMA

Refugees in Dadaab and Kakuma face complex challenges in reliably accessing sustainable energy sources. There is short supply of electricity in both settlements, with Dadaab relying mostly on diesel and firewood, and Kakuma dependent on diesel, solar energy, ethanol, and briquettes<sup>14</sup>. However, organisations such as UNHCR have begun providing solar alternatives and other more reliable energy sources<sup>15</sup>.

Kakuma is one of the biggest beneficiaries of sustainable energy solutions targeting refugee settlements, with many households benefiting from installation of photovoltaic solar systems and street lights<sup>16</sup>. Kakuma also has entrepreneurial refugees who have taken advantage of solar technology to provide electricity to locals for a monthly fee<sup>17</sup>. Local refugees who do not have direct access to electricity rely on these businesses to access IT services and charge mobile phones.

<sup>13</sup> GSMA "Mobile Market overview in South Sudan", <https://www.gsmaintelligence.com/markets/3906/dashboard/>. Accessed 26<sup>th</sup> June 2017

<sup>14</sup> Glada Lahn, Kofi Anna, and Owen Grafham, "Heat, Light and Power for Refugees Saving Lives, Reducing Costs," n.d.

<sup>15</sup> UNHCR, "Solar Energy Boosts Learning in Refugee Camp," UNHCR, 2017, <http://www.unhcr.org/ke/11224-solar-energy-boosts-learning-refugee-camp.html>.

<sup>16</sup> UNHCR, "EDP's Kakuma UNHCR Refugee Camp Project – Environmental Sustainable Energy Solutions for Breaking the Refugee Poverty Cycle at the Kakuma UNHCR Refugee Camp in Kenya," 2014.

<sup>17</sup> RSC, "Informal versus Formal Infrastructure Energy and Water Systems in the Kakuma Refugee Camps, Kenya," 2016.

## NAKIVALE AND BIDIBIDI

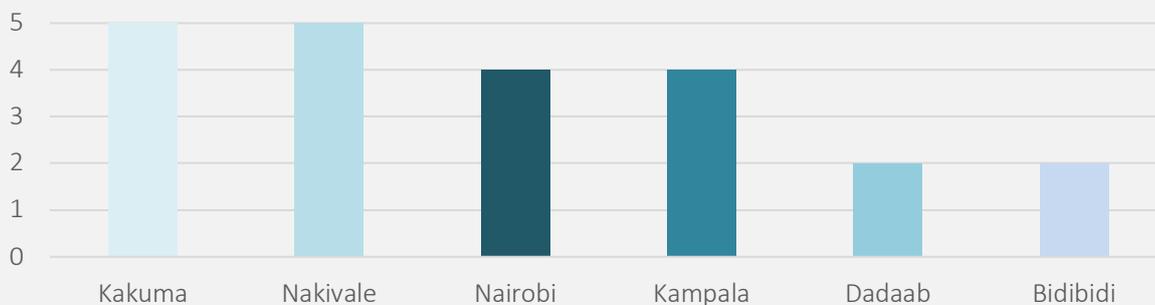
Both Nakivale and Bidibidi refugee camps are located in remote parts of Uganda. Whereas Nakivale is connected to the national electricity grid, refugee households do not have access to electricity<sup>18</sup>. Diesel, firewood and briquettes are the major sources of energy for refugee households<sup>19</sup>. Only 30% of Nakivale refugees can access electricity through solar panels and diesel generators<sup>20</sup>.

There is limited literature on status of infrastructure in refugee settlements in Northern Uganda such as Bidibidi, as many were opened recently to accommodate the ongoing influx of South Sudan refugees.

## NAIROBI AND KAMPALA

Despite Nairobi and Kampala being host to many urban refugees, there is very limited refugee focused data on access to on-grid (mains) electricity and alternative source of energy. An assumption can only be made that refugees in Nairobi and Kampala have access to electricity on the premise that they are both developed capital cities and busy commercial hubs in East Africa. Furthermore, Kenya's GPOBA Electrification Programme, led Kenya Power and supported by the World Bank, aims to provide on-grid electricity to 150,000 households in informal settlements across the country; many of which are based in Nairobi and home to urban refugees<sup>21</sup>.

Figure 8: Access to energy



## CRITERIA 7: ESTABLISHMENT OF REFUGEE SETTLEMENTS OR COMMUNITIES

The age of a refugee settlement (based on the year it was established) may provide a useful indicator as to how well established infrastructures are to support essential services such as electricity, water and education. The older the settlement, the more established the infrastructure. Table 2 below provides a summary of the year each refugee settlement was established. Nairobi and Kampala have not been included as refugee communities are spread throughout both cities making it difficult to determine when specific infrastructures were first installed. It is however assumed that both Nairobi and Kakuma have relatively advanced and well maintained infrastructure compared to refugee settlements.

Table 2: Year of establishment of selected refugee settlements

Refugee settlement	Year Established
Nakivale	1958
Dadaab	1991
Kakuma	1992
Bidibidi	2016

<sup>18</sup> Lahn, Anna, and Grafham, "Heat, Light and Power for Refugees Saving Lives, Reducing Costs."

<sup>19</sup> Mohamed Halima, "What It's Like to Live in a Refugee Settlement without Energy," Medium, 2016, <https://medium.com/@unfoundation/what-its-like-to-live-in-a-refugee-settlement-without-energy-57d24e21b9ca>.

<sup>20</sup> HEDON, "Energy in Emergency Settings," 2016.

<sup>21</sup> Ministry of Energy and Petroleum, "GPOBA Electrification Programme." <http://www.energy.go.ke/index.php/projects/247-gpoba-electrification-project.html>. Last visited 26 June 2017.

## Selection of refugee locations

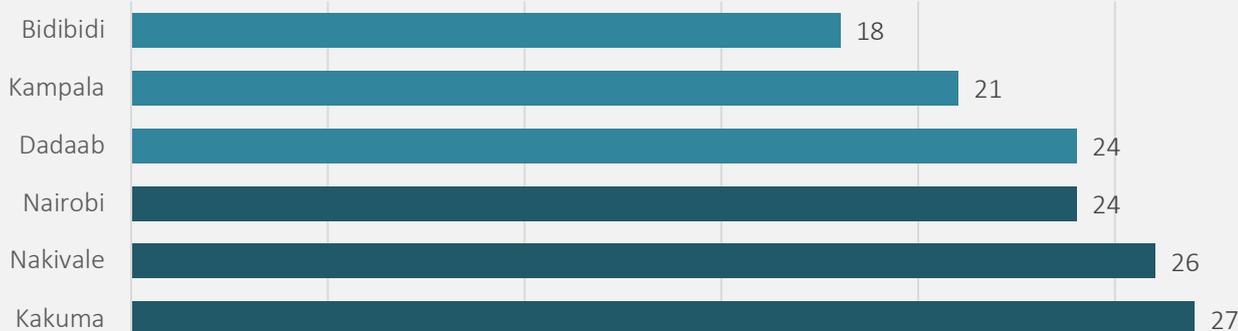
Each criterion presented in Table 1 has been evaluated based on the findings presented above. The evaluation has been made by ranking criterion relative to each location. A maximum score of six is allocated to the most relevant location, with a descending score assigned to subsequent locations. For example, Bidibidi has the largest refugee population under review, and so scores six; Nairobi has the smallest refugee population and therefore scores one. The results are shown in Table 3.

Table 3: Scoring of evaluation criteria to aid in selection of refugee locations for further study

Camp / settlement	Demographic			Infrastructure				Total score
	Population size	Diversity	% Under 18	Access to energy	Signal & WIFI coverage	Access to mobile devices	Camp age	
Kakuma	4	6	4	5	2	2	4	27
Nakivale	3	3	3	5	2	4	6	26
Nairobi	1	5	2	4	3	6	3	24
Dadaab	5	2	5	2	2	3	5	24
Kampala	2	4	1	4	3	5	2	21
Bidibidi	6	1	6	2	1	1	1	18

The final score for each location is visualised in Figure 9. **Kakuma** and **Nakivale** rank the highest against the evaluation criteria used, followed by Nairobi and Dadaab. Because this study will focus on two dedicated refugee settlement and one urban settlement, **Nairobi** has been selected as the third location for further study.

Figure 9: Scoring for selection of refugee locations for further research



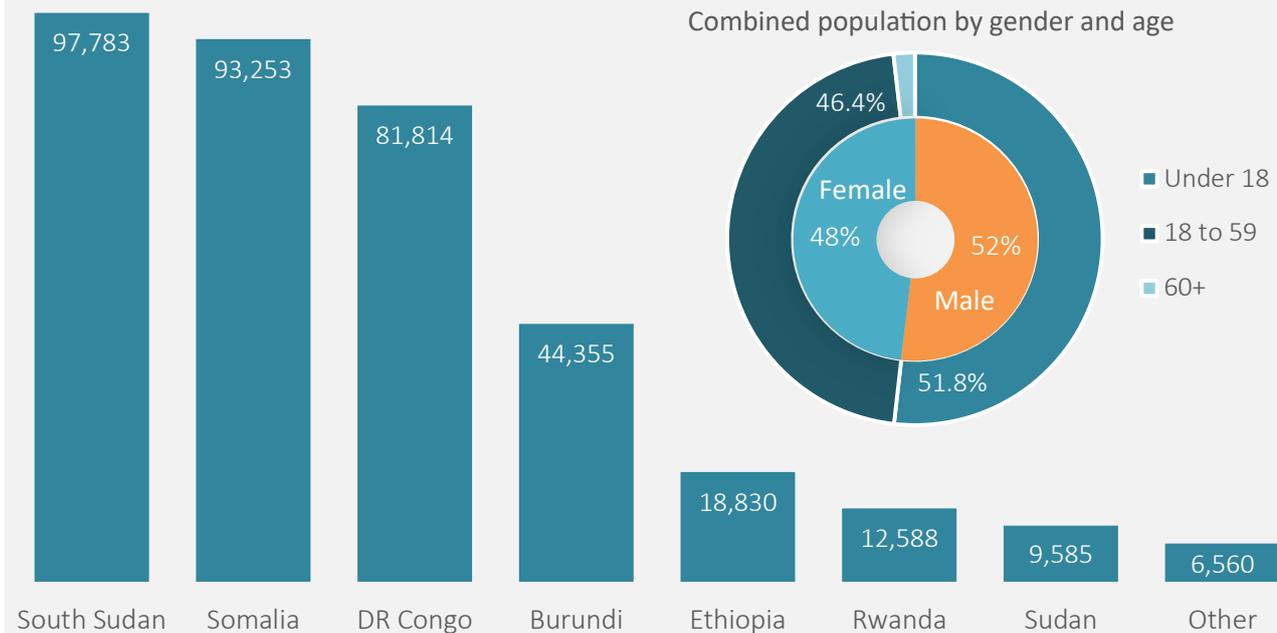
### SUMMARY OF SELECTION

Kakuma in Northern Kenya and Nakivale in Southern Uganda host a diverse range of nationalities from across the region, including refugees from Somalia in the East, to DR Congo in the West. Their diversity provides an opportunity for us to better understand the role mobile technology plays for refugees traveling to, from and within the region, and how it can support the lives of refugees once they reach settlements.

Given the size of Nairobi and the number of refugee communities it hosts, our study must be narrowed to take account of the limited resources available for the research. As almost 50 percent of refugees in Nairobi are Somali, this study will focus primary data collection in **Eastleigh**, which is where most Somali refugees reside. This will also allow us to understand any connections in technology use between Somali's living in Eastleigh and those hosted in Dadaab.

Based on the three locations selected, combined refugee demographics for population diversity, age and gender are summarised in Table 10 below.

Figure 10: Combined refugee populations across Kakuma, Nairobi (Eastleigh) and Nakivale



## Conclusion

Literature on the use of mobile technology for migration mostly focuses on migration into Europe, with little research conducted to assess the technology uses and needs of refugees traveling to, from and within East Africa. This study was developed a means of researching innovate mobile solutions for refugees in the region.

As little is known about how refugees use mobile technology (or would benefit from it) this study will collect primary data through face-to-face surveys with refugee populations in Kenya and Uganda. Surveys will be conducted in two refugee settlements, one in each country, in addition to one urban centre

This brief desk review has analysed seven evaluation criteria (detailed in Table 1) across six refugee settlements to determine which locations across Kenya and Uganda are most suited for further research through primary data collection.

**Kakuma** in Northern Kenya, and **Nakivale** in South Western Uganda were selected as the most suitable refugee settlements for further research based on the evaluation criteria presented. Nairobi – specifically the District of **Eastleigh** – was selected as the most suitable urban location.

Between them, these locations host a large and diverse range of refugees with nationalities from across the region. They also contain significant numbers of refugees with access to mobile devices, supported with relatively good mobile phone signal coverage and access to internet through WIFI. These factors provide a strong basis on which to explore how refugees traveling within East Africa use mobile technology to support migration, and to what extent current technology solutions meet their needs.

# Acknowledgements

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This study was made possible through the kind support of the Humanitarian Innovation Fund, ELRHA, DFID and Sida.

The research team at Samuel Hall would also like to thank UNICEF and IOM for their unfailing support in helping the team access Kakuma refugee camp and Nakivale settlement, as well as their support in conducting the field study and their hospitality in providing accommodation in both locations.

We would also like to thank the many academics and subject experts who supported the development of the quantitative survey and who donated their valuable time to participate in key informant interviews.

Finally, we would like to recognise the contribution of our team of refugee enumerators in Kakuma and Nakivale, without whom our data collection would not have been possible.

## Authors:

Project Director: Dr Benjamin Hounsell

Senior Research Assistant: Mr. Jared Owuor



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This report has been produced by Samuel Hall's Implementation Research Pillar.

