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# Digital Access and Barriers in Displacement-affected Communities in West Darfur, Sudan

Results of a Connectivity  
Needs and Usage Assessment  
(CoNUA) by the Norwegian  
Refugee Council and the GSMA

August 2022





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The Norwegian Refugee Council is an independent humanitarian organisation helping people forced to flee. We work in crises across 35 countries, providing life-saving and long-term assistance to millions of people every year. Our overall objective in Sudan is to contribute to the survival, protection and dignity of conflict and displacement-affected people while helping them to achieve durable solutions. We seek to respond to emergencies in the aftermath of violence and disaster and to tackle long-term displacement by promoting durable solutions through impactful programs and advocacy. We stand up for people forced to flee and promote and defend displaced people's rights and dignity.

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This assessment was possible thanks to the generous support of the Norwegian Ministry of Foreign Affairs.



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# Executive summary

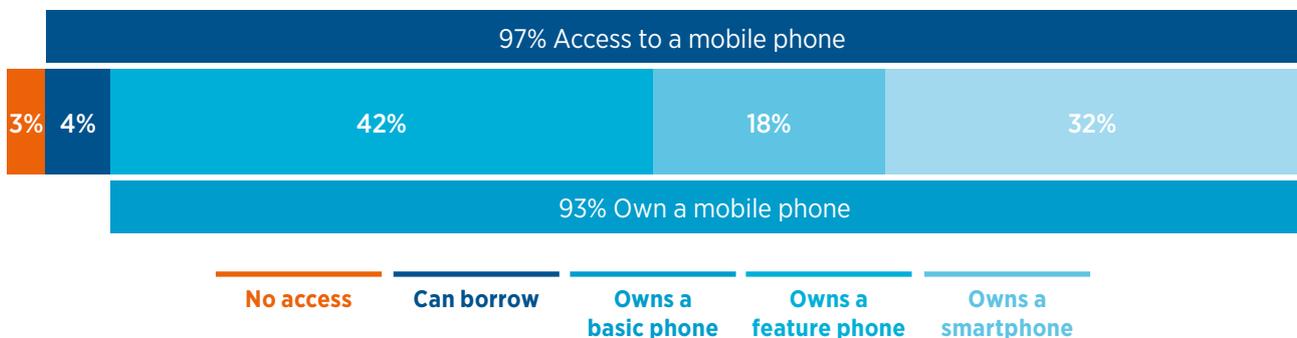
In Sudan, numerous overlapping crises have left 14.3 million people in need of humanitarian assistance in 2022. This includes roughly 5 million displaced people: 2.9 million internally displaced people, 1.2 million refugees and 0.9 million returnees. This group currently experiences significant barriers to meeting a variety of basic and essential needs and are in acute need of support.

This report shares findings on the access and use of mobile technology among displacement affected communities in six locations across West Darfur. West Darfur is a state in western Sudan that is home to nearly two million people, more than 900,000 of whom need humanitarian assistance in 2022. Roughly one in five people in West Darfur are currently or have previously been internally displaced. Some people have lived in displacement camps in the state for more than ten years. An increase in inter-communal fighting since 2021 has driven primary and secondary displacement of an estimated 250,000 people, many of whom are residing in public facilities and living in unsanitary conditions.

Findings from this assessment should be interpreted knowing that 65% of the data was collected remotely, over the phone due to insecurity and rise in COVID-19 cases during the assessment period. While the assessment team put in a lot of effort to minimise the impact of this approach, the data is skewed to over emphasise the experience of people with digital access. This has not changed the overall story of the results (see Methodology).

Understanding mobile access and ownership is essential when considering the use of digital technology for humanitarian assistance. Our research indicates that access to mobile phones is high, with 97 per cent of respondents saying that their household owns at least one handset. Personal ownership is also high, with 92 per cent reporting that they own their own mobile phone. The most prevalent barriers to owning a mobile handset are related to cost and affordability. These figures hide discrepancies based on gender, age, disability status and primary language spoken. For example, women are 57 per cent less likely to own a smartphone than men in the sample.

**Figure 1**  
**Individual access to a mobile phone**



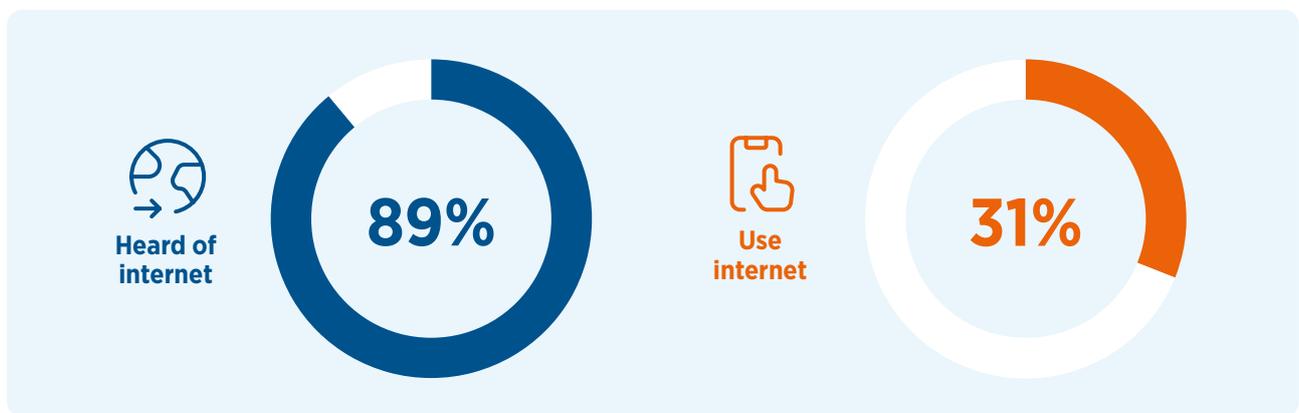
Q: What kind of phone do you personally own? (None, Basic, Feature, Smart) and Do you have access to someone else's mobile phone?  
Base: All respondents; n: 1,547



Access to a handset is only one component of accessing digital services and being digitally included, it is equally important to understand digital literacy and knowledge levels. Whilst knowledge of basic phone functions was high, less than 40 per cent of people knew how to use any service that required internet access.

Unsurprisingly, there were low levels of internet usage in the sample, but there was a considerably higher level of awareness that it existed. Perhaps logically, 90 per cent of smartphone owners use it to access the internet, a group which skews younger, male, Arabic speaking and without disabilities. The key barriers preventing people moving on from awareness of mobile internet into its use are around coverage, digital skills, and the cost of data.

**Figure ii**  
**Internet awareness and use**



Q: Have you ever heard of the internet (apps, services, and websites like Facebook, WhatsApp, Messenger)? and Do you currently own a phone and use mobile internet?  
Base: All respondents; n:1,527

Just one per cent of people reported using mobile money services. However, roughly two thirds reported sending and receiving credit between friends and family, suggesting a potentially unmet need for formal digital financial services which providers might capitalise.

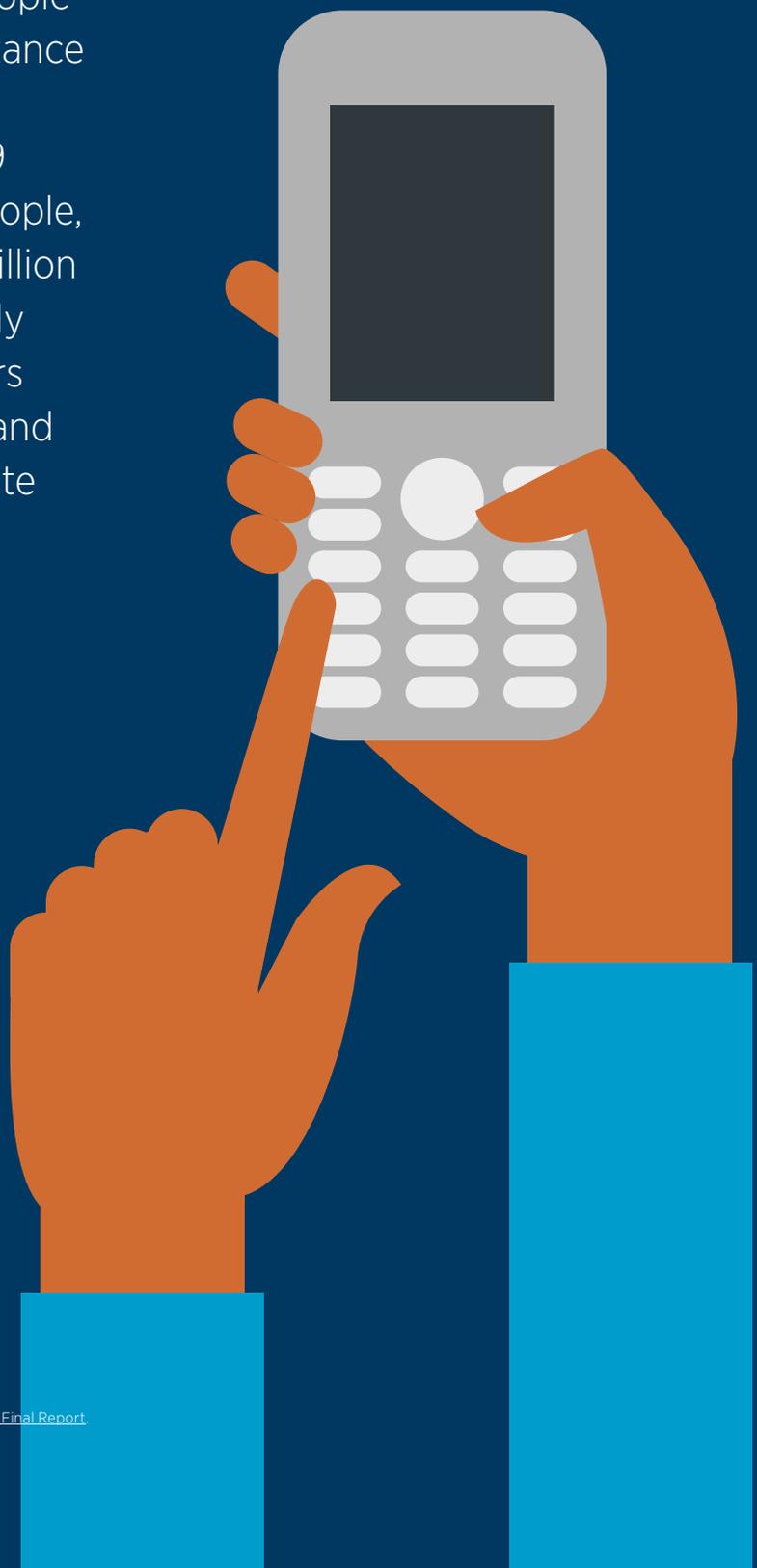
The assessment results also show the state of the digital ecosystem in the research settings in West Darfur, including the availability of networks, charging, agents and other services. Researchers were able to use a range of services across the

locations with all three networks, with varying degree of coverage. Interviews with merchants providing mobile-enabled services revealed that a range of products and support are available to users. Merchants reported selling airtime/data, providing access to charging services, and selling phones and SIM cards (to varying degrees). They also provide a range of problem-solving services and a handful of merchants repair broken handsets to extend the life of their customers' mobile phones.



# Introduction

In Sudan, numerous overlapping crises have left 14.3 million people in need of humanitarian assistance in 2022. This includes roughly 5 million displaced people: 2.9 million internally displaced people, 1.2 million refugees and 0.9 million returnees.<sup>1</sup> This group currently experiences significant barriers to meeting a variety of basic and essential needs and are in acute need of support.<sup>2</sup>



<sup>1</sup> UN OCHA. (2021). Humanitarian Needs Overview: Sudan.

<sup>2</sup> REACH Initiative. (2020). [Sudan 2020 Multi-sector Needs Assessment: Final Report](#).

There is growing recognition that mobile technology and mobile network operators (MNOs) have an important role to play in delivering dignified, efficient and impactful humanitarian assistance. In a context such as Sudan, which is often insecure and where humanitarian access can be extremely challenging and unpredictable, mobile and digital assistance can help overcome these challenges.

Fortunately, the Sudanese digital ecosystem demonstrates potential for the use of digital tools. As of 2022, 70 per cent of Sudan's population were covered by a 3G network, 49 per cent by a

4G network and overall unique mobile subscriber penetration was 49 per cent, indicating that around half the population has a mobile phone. The number of mobile internet subscribers is also growing nine per cent year on year.<sup>3</sup>

However, digital humanitarian assistance remains underexplored in Sudan. The deployment of effective pilots and development of digital humanitarian strategies are hampered by a lack of evidence on current access to and use of digital technology among those in need.

## Objectives

This report highlights the findings of one of two Connectivity Needs and Usage Assessments (CoNUA)<sup>4</sup> conducted by the Norwegian Refugee Council (NRC) Sudan and supported by the GSMA and the REACH Initiative. This report focuses on findings from West Darfur state while the other focuses on White Nile.<sup>5</sup>

This assessment was conducted with three key objectives in mind:

1. To understand mobile phone use and access by refugees and the communities that host them in West Darfur.
2. To understand network coverage and strength in displacement settings in West Darfur.
3. To assess the availability and feasibility of mobile money services in West Darfur from the perspective of users.

A major theme of this assessment was identifying groups and communities at risk of digital exclusion. This was done to inform the deployment of digital technology and ensure programming does not exacerbate existing inequalities.

NRC has a regional objective to improve access to digital technology and communication for displaced populations and the communities that host them, including providing humanitarian assistance via digital platforms. NRC Sudan plans to use the findings of this assessment to design and pilot context-appropriate, evidence-based digital solutions. These pilots will be conducted through strategic partnerships and collaboration to enhance the digital ecosystem in Sudan.

It is hoped that by making the results of this assessment public, other actors, including government, humanitarian organisations and the private sector, will consider how mobile and digital technology might be used effectively in these settings and identify the work needed to facilitate equitable digital access and inclusion.

<sup>3</sup> GSMA Intelligence, Data by market (Sudan). Available at: <https://data.gsmainelligence.com/data/market-metrics> (accessed 4 April 2022)

<sup>4</sup> Baah, B., Downer, M. and Kruk, L. (2020) Humanitarian Connectivity Needs and Usage Assessment (CoNUA) Toolkit, GSMA.

<sup>5</sup> Caswell, P. and Downer, M. (2022). [Digital Access and Barriers in Displacement-affected Communities in White Nile, Sudan](#). GSMA and NRC.



## Context

### West Darfur

West Darfur is a state in western Sudan that shares a border with Chad and is home to nearly 2 million people. More than 900,000 people in West Darfur will need humanitarian assistance in 2022, nearly half of the population. Roughly one in five people in West Darfur are displaced or returnees, 300,000 of whom are internally displaced in Sudan. Some of these IDPs have lived in camps in West Darfur for more than 10 years. An increase in inter-communal fighting since 2021 has led to the primary and secondary displacement of an estimated 250,000 people, many of whom are residing in public facilities and living in unsanitary conditions.<sup>6</sup>

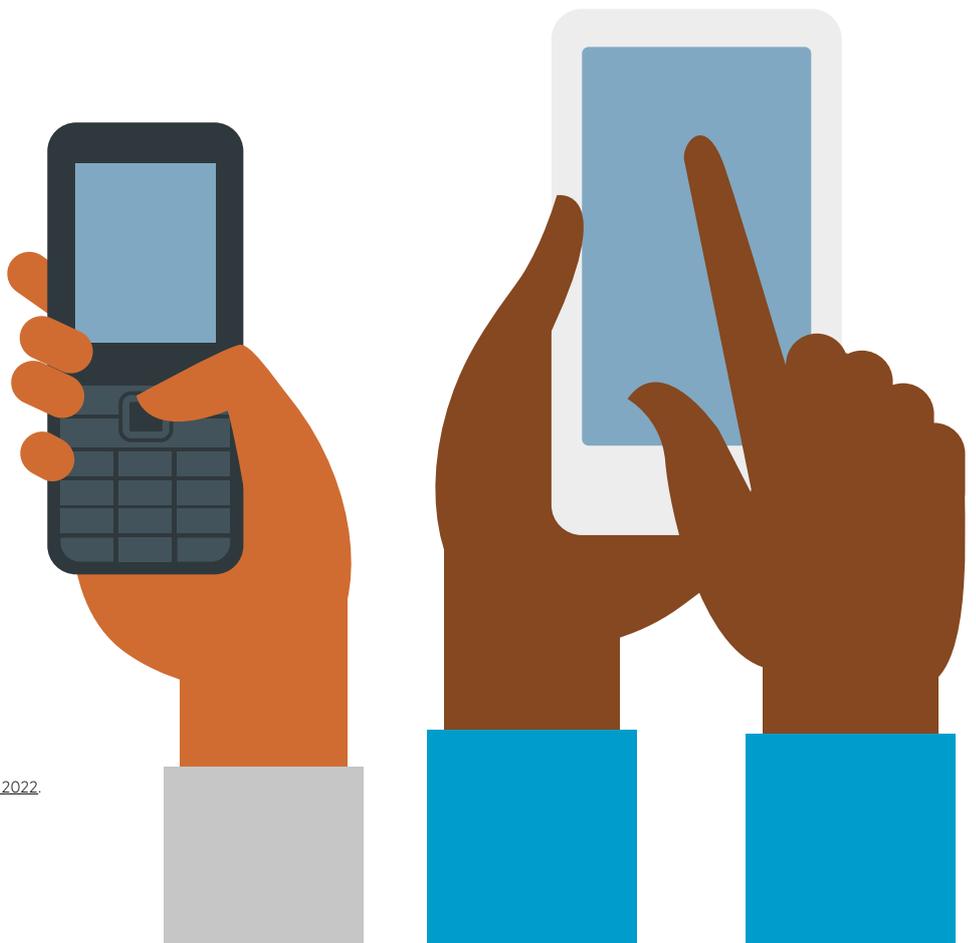
NRC fully opened its office in Al Geneina, West Darfur in June 2021 as part of a response to a large sudden influx of IDPs deploying site management programming. NRC collaborated with the state civil registry to support the issuance of legal and civil documents to IDPs to allow them to claim and exercise their rights and access essential services. NRC also contributed to improving living conditions

in areas of displacement by installing solar lights, desludging communal latrines and leading anti-cholera and cleaning campaigns.

All three of Sudan's MNOs – MTN, Sudatel (trading as Sudani) and Zain – have a presence in West Darfur, with varying degrees of coverage and market penetration. Both MTN and Sudani have mobile money deployments and Zain plans to launch one in 2022.

### Research locations

West Darfur was selected as a research location due to the scale of humanitarian coverage, the increasing level of need in the state and the current lack of available evidence on digital access for those in need. Through key informant interviews with local leaders, humanitarian actors and staff, NRC identified six administrative units and associated settlements that have experienced conflict and associated displacement. These were then selected as research locations.



<sup>6</sup> UN OCHA. (2022). [West Darfur State Profile – March 2022](#).



**Research locations and populations:**

**El Geneina, El Geneina**

Host community: **189,901** IDPs: **165,000**

**Kereinik, Kereinik**

Host community: **30,002** IDPs: **28,338**

**Misterei, Beida**

Host community: **21,455** IDPs: **10,311**

**Murnei, Kereinik**

Host community: **37,864** IDPs: **81,012**

**Sileia, Jebel Moon**

Host community: **12,351** IDPs: **11,947**

**Krinding, El Geneina**

Host community: **unknown** IDPs: **13,946**





## Methodology

This assessment used three tools from the GSMA CoNUA toolkit (Table 1) and data was collected between 18th January and 15th February 2022.<sup>7</sup>

The **end user survey instrument** was used to collect quantitative data from IDPs and the communities who host them. For the analysis, it was decided to combine these two groups, as their experiences were

found to be similar and many of the host community have also previously experienced displacement.

The **merchant survey instrument** was used to collect data from agents on the services provided in the research locations. The **signal strength mapping tool** was used to collect data on network availability.

**Table 1:**  
**Assessment sample by location**

	El Geneina	Sileia	Kereinik	Krinding	Misterei	Murnei	Total
 <b>End user survey</b>	230	204	302	320	277	214	<b>1,547</b>
 <b>Merchant survey</b>	25	1	1	4	5	8	<b>44</b>
 <b>Signal strength</b>	5	2	0	2	4	0	<b>13</b>

## Methodological drawbacks

Due to the unstable security situation in West Darfur, much of the data collection was conducted over the phone (65 per cent of survey interviews). The assessment team made significant efforts to mitigate the drawbacks of using phones to conduct an assessment related to phone use and digital access. This included the use of ‘recall interviews’ to ask displaced individuals to respond considering the situation in the place they had been displaced from; and working with colleagues in the field to provide a phone to those without one, so that NRC could still

conduct remote interviews with individuals without easy and ready access to phone by themselves. Despite best efforts, it should still be acknowledged that this modality likely influenced the results of the study and increased the likelihood that the most digitally excluded were not represented. The remote sample skews quite heavily male (71 per cent of respondents), which is likely to paint a more positive picture of digital inclusion. This is because men, both in this research and more broadly, are more likely to be digitally included.

<sup>7</sup> Baah, B., Downer, M. and Kruk, L. (2020). [Humanitarian Connectivity Needs and Usage Assessment \(CoNUA\) Toolkit](#). GSMA.

To try and understand the impact this approach had on the results; key metrics were compared between the two modalities (Table 2). Except for one metric, these differences were all within 10 per cent. The one outlier was the number of people who had

personally used a phone in the last three months, where the difference was 11 per cent. This is likely because all those taking part in the survey remotely were using a phone to do so, meaning that they had all technically used a phone in the last three months.

**Table 2:**  
**Differences in key access metrics, by interview type**

	Household ownership	Personal recent use	Personal access	Personal ownership	Smartphone ownership	Internet usage
<b>In person</b>	95%	85%	94%	89%	26%	25%
<b>Over the phone</b>	98%	96%	98%	94%	35%	34%
<b>Difference</b>	<b>3%</b>	<b>11%</b>	<b>4%</b>	<b>5%</b>	<b>9%</b>	<b>9%</b>

Considering that the differences in these metrics are such that they do not change the overall story of the findings, it was decided to continue to present the findings as one sample. As already flagged, readers should consider them more indicative than representative, but we are confident they tell an accurate story relating to the digital inclusion of displacement affected communities in West Darfur.

Although much effort was made to overcome the security issues related to the sample, the final survey is largely a convenience sample. As such we cannot state with certainty how representative the figures are of the communities in West Darfur. Combined with the modality, these figures should largely be considered indicative as opposed to representative.

Finally, the security situation also meant that it was not possible to conduct focus group discussions (FGDs) in West Darfur as was possible in the concurrent assessment in White Nile.

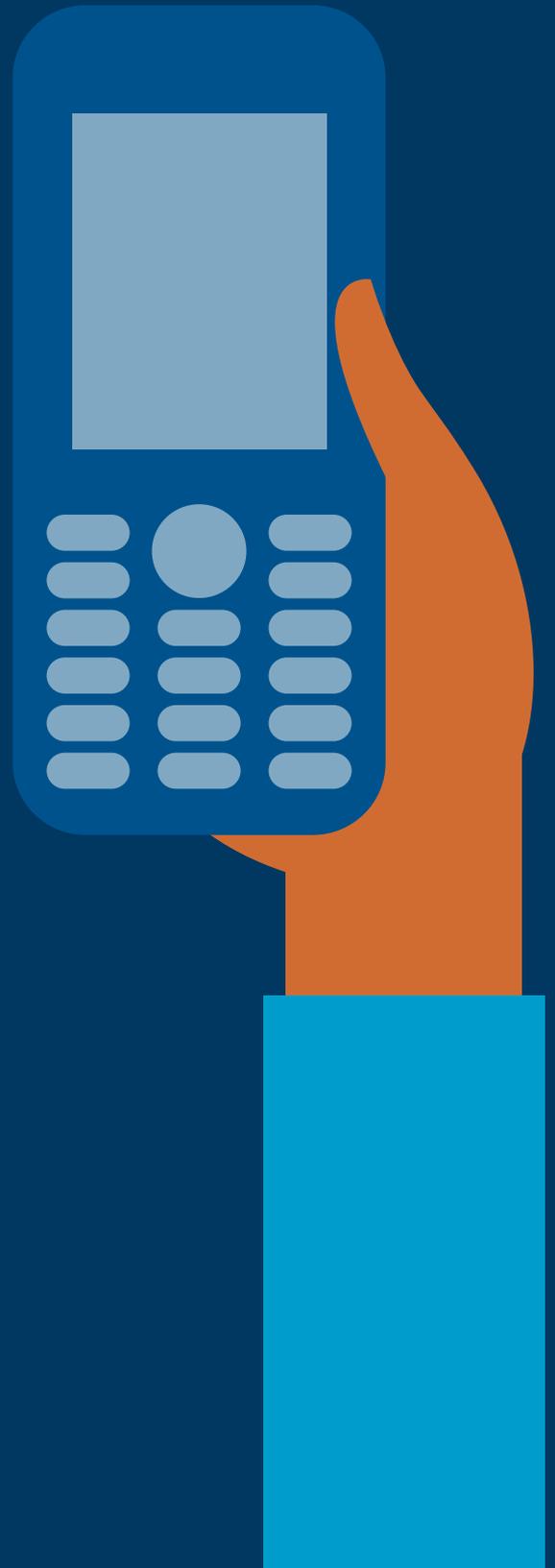
Full details on the methodology can be found in **Annex 2**.





# Mobile phone access and ownership

Understanding mobile phone access and ownership is essential when considering the use of digital technology for humanitarian assistance. This chapter quantifies mobile phone ownership by breaking it down by handset type and establishing the extent to which people can borrow someone else's handset. It also delves into the landscape of access for groups traditionally at risk of digital exclusion.





## Trends in mobile phone access

The survey data indicates that **most people in the research locations have access to a mobile phone.**

Ninety-seven per cent of respondents said that their household owns a handset, with most also saying they owned more than one (Figure 1), this was the

case for 95 per cent of those interviewed in person and 98 per cent of those interviewed over the phone. Ninety-two per cent of respondents also said that they had used a phone, for any reason, in the last three months.

**Figure 1**  
**Number of mobile phones in the household**

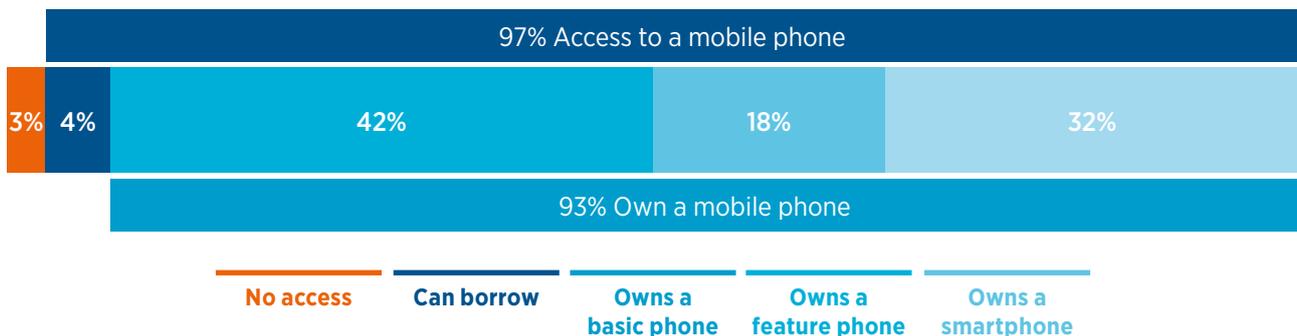


Q: How many mobile phones does your household own?  
Base: All respondents; n: 1,547

In terms of mobile ownership, 92 per cent of respondents reported owning their own phone, and when including those who reported being able to

borrow a handset, 97 per cent of people were able to access a phone (Figure 2).

**Figure 2**  
**Individual access to a mobile phone**



Q: What kind of phone do you personally own? (None, Basic, Feature, Smart) and Do you have access to someone else's mobile phone?  
Base: All respondents; n: 1,547



## Barriers to mobile phone ownership

Understanding the barriers people face to owning a mobile phone of their own can inform strategies to increase mobile access and foster digital inclusion in communities in need of humanitarian assistance. This information is often not well known by humanitarian organisations or private sector stakeholders and can highlight nuanced and interrelated issues.

Based on responses to the end user survey by individuals who do not own their own handset, cost is the greatest barrier to mobile ownership (Table 3).

**Table 3**  
**Top five barriers to mobile phone ownership**



Q: Which of the following reasons prevent you from owning a mobile phone? Base: Non-phone owners; n: 115

## SIM cards

A SIM card registered in one's own name is a prerequisite to accessing mobile services. Sudanese law requires SIM cards to be registered using a recognised identity document (ID). Nine in 10 phone owners, both displaced and from the host community, reported that their SIM was registered in their own name (Table 4). However, the survey did not provide an option for a SIM card to be unregistered. Based on a broader understanding of the context, it is likely that unregistered SIMs have been conflated with registering it in one's own name since an individual would have purchased the SIM themselves.

**Table 4**  
**SIM card registration**



Q: Whose name is registered with your main phone number? Base: Mobile phone owners; n: 1,427



## Access gaps

Mobile phone access and ownership rates often reflect existing inequalities in a community, which means the use of digital services has the potential to exacerbate these inequalities.<sup>8</sup> This section looks at differing levels of access to mobile phones based on gender, disability status, age and language. These differences represent access gaps presented as proportional differences.<sup>9</sup>

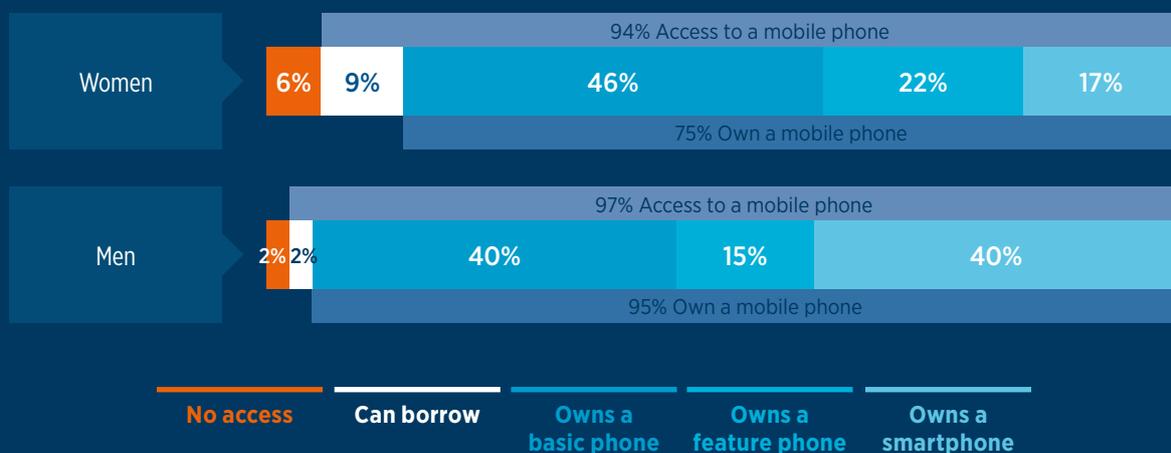


### Gender gap

Rates of mobile phone ownership differ between men and women (Figure 3), with women being 11 per cent proportionally less likely to own a phone than men. This gap was increasingly prominent when looking at smartphones, where women are

57 per cent less likely to own one than their male counterparts. In comparison, GSMA research has found that across the Middle East and North Africa, women are nine per cent less likely to own a mobile phone than men.<sup>10</sup>

**Figure 3**  
Individual access to mobile phones, by gender



What kind of phone do you personally own? (None, Basic, Feature, Smart) and Do you have access to someone else's mobile phone?  
Base: All respondents; n: Women=565, Men=981

<sup>8</sup> Casswell, J. (2019). *The Digital Lives of Refugees*. GSMA.  
<sup>9</sup> See Annex 2: Methodology for more detail on how these gaps are calculated.  
<sup>10</sup> GSMA. (2021). *The Mobile Gender Gap Report 2021*.



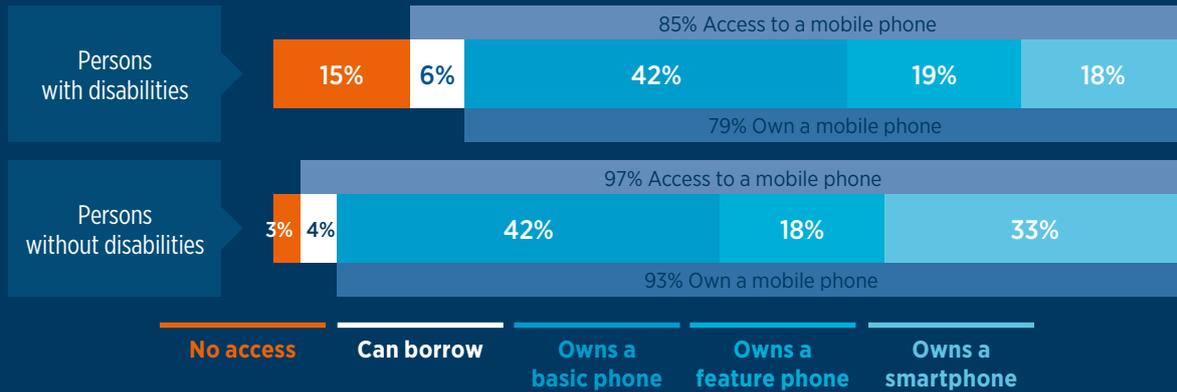
## Disability gap

Prevalence of disability is relatively low in the sample (6%)<sup>11</sup>, but even with such a small sub-sample, the differences in phone access were noticeable. Persons

with disabilities were 15 per cent less likely than those without a disability to own a mobile phone and 45 per cent less likely to own a smartphone.

Figure 4

### Individual access to a mobile phone, by disability status



Q: What kind of phone do you personally own? (None, Basic, Feature, Smart) and Do you have access to someone else's mobile phone?  
Base: All respondents; n: (Persons with disabilities=95, Persons without disabilities=1,452)



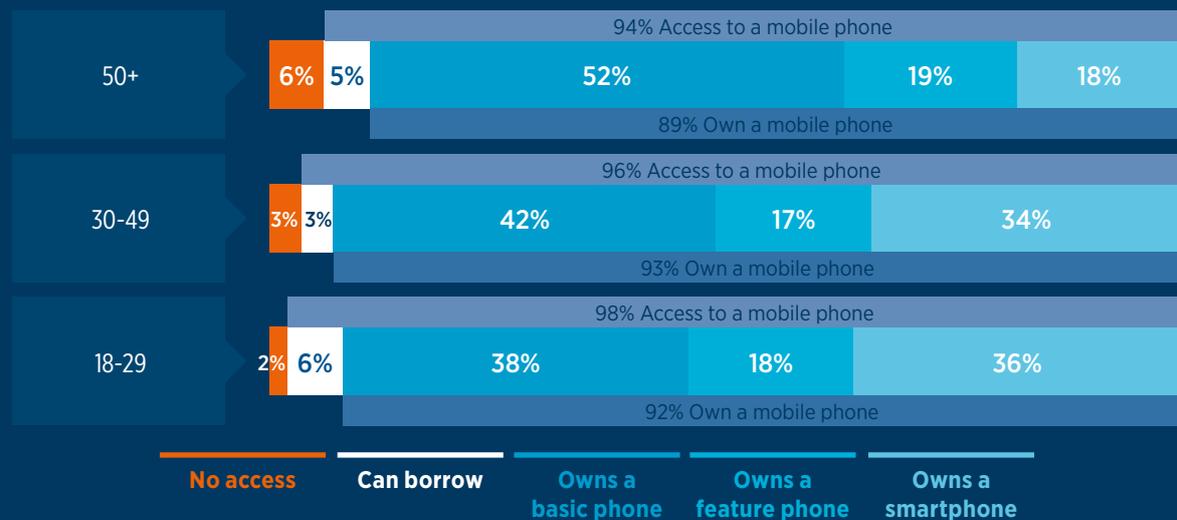
## Age gap

While overall access and ownership was relatively consistent across the age groups, the survey identified that people aged 50 and over were

49 per cent less likely to own a smartphone than those under 50, and those aged 50 and over were more likely to rely on a basic phone.

Figure 5

### Individual access to mobile phones, by age



Q: What kind of phone do you personally own? (None, Basic, Feature, Smart) and Do you have access to someone else's mobile phone?  
Base: All respondents; n: (18 to 29=532, 30 to 49=751, 50+=264)

<sup>11</sup> According to the Washington Group Short Set of Questions.

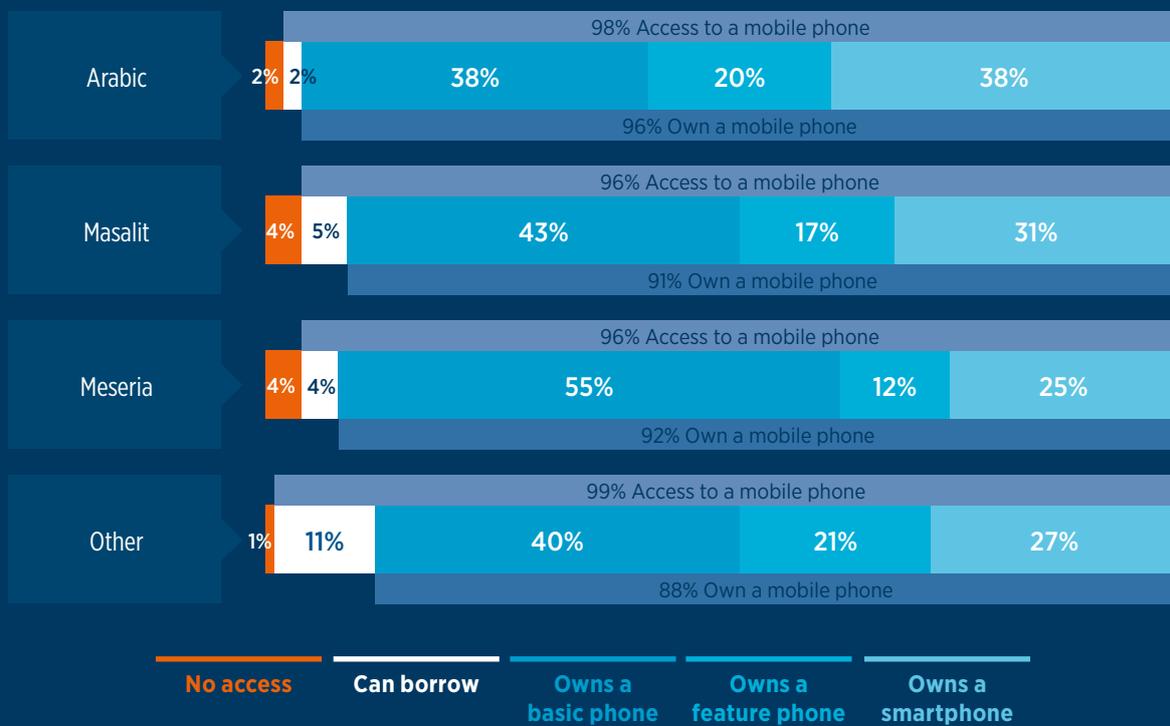


## Language gap

There were clear gaps in access to mobiles between individuals who primarily speak Arabic at home (Sudan's majority language<sup>12</sup>) and those who primarily speak minority languages. Our analysis compared Arabic, Masalit, Meseria and Other, which

includes Bargo, Dajo, Foor, Jabal, Tama and Zagawa. The data shows that Arabic speakers were most likely to have to own a smartphone, an internet enabled phone or any mobile phone at all.

**Figure 6**  
**Individual access to mobile phones, by language**



Q: What kind of phone do you personally own? (None, Basic, Feature, Smart) and Do you have access to someone else's mobile phone?  
Base: All respondents; n: Arabic=399, Masalit=937, Meseria=127, Other=81

<sup>12</sup> According to CLEAR Global (formerly Translators Without Borders), "People who speak the languages of power rarely struggle to find information in their language", which means speaking a minority or marginalised language can galvanise digital exclusion and present a barrier to accessing vital information and services. CLEAR Global, CLEAR Tech (website), <https://clearglobal.org/clear-tech/> (accessed 28 April 2022).



# Digital literacy and use of services

Access to a handset is only one component of accessing digital services and being digitally included. Digital literacy and knowledge and the ways in which people use specific services are equally important. This section looks at knowledge of mobile services, use of offline services, awareness and use of mobile internet and concerns surrounding the use of mobile phones.





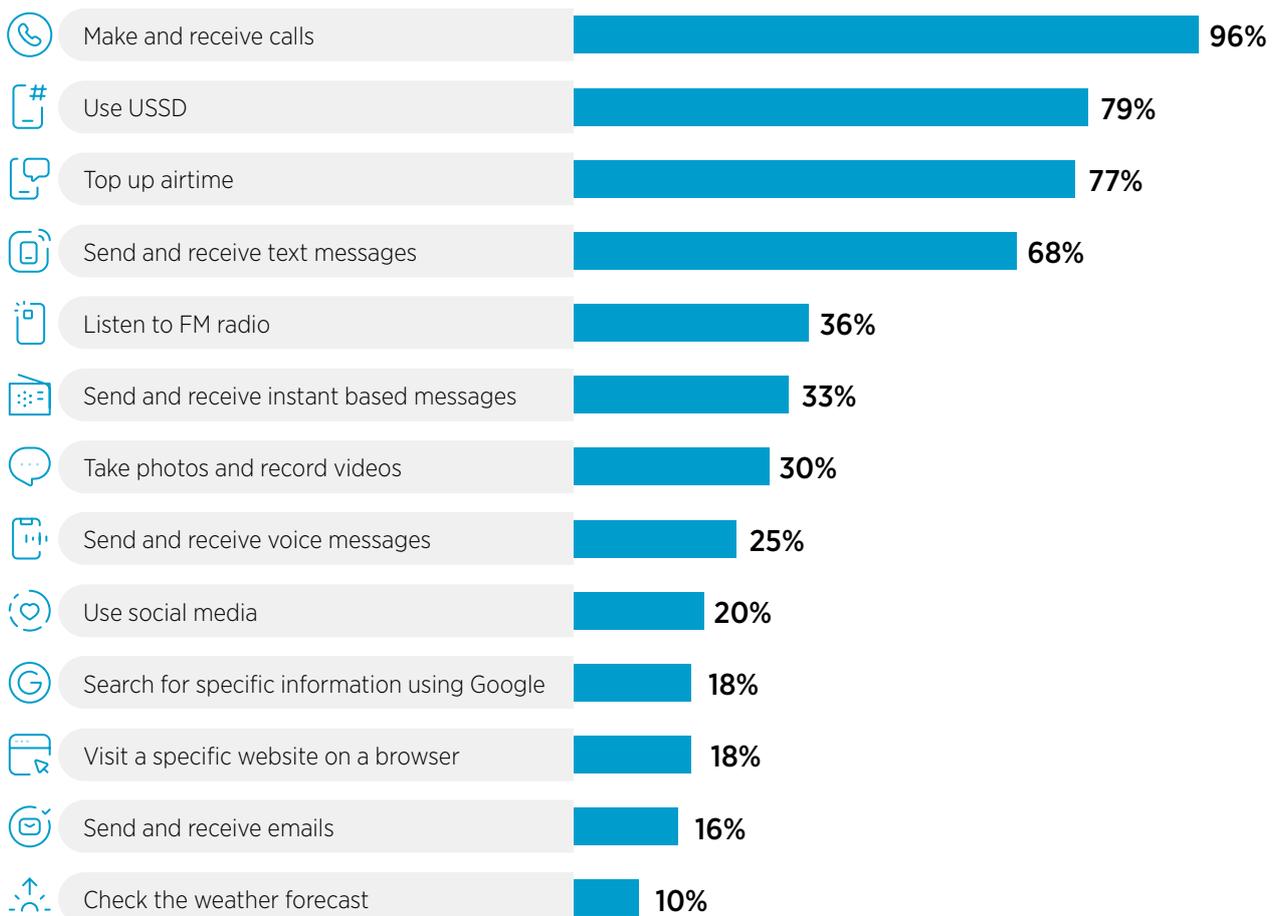
## Knowledge of mobile phone use

Knowledge of the basic functionality of a mobile phone was generally high. Respondents (less than one per cent) said they did not know how to turn a phone on and off, and people (90 per cent) said they knew how to charge a phone and how to remove and insert a SIM card (91 per cent). Slightly fewer people knew how to lock and unlock a mobile phone (63 per cent). Unsurprisingly, smartphone owners were much more likely to know how to do this (96 per cent).

Virtually all respondents knew how to make and receive calls, and many knew how to use USSD, top up airtime and send/receive SMS messages. Importantly, less than 35 per cent of people knew how to use any service that required internet access (Figure 7).

Figure 7

### Knowledge of mobile services



Q: Do you know how to use a phone to....?  
 Base: All respondents; n: 1,547



## Use of mobile phones

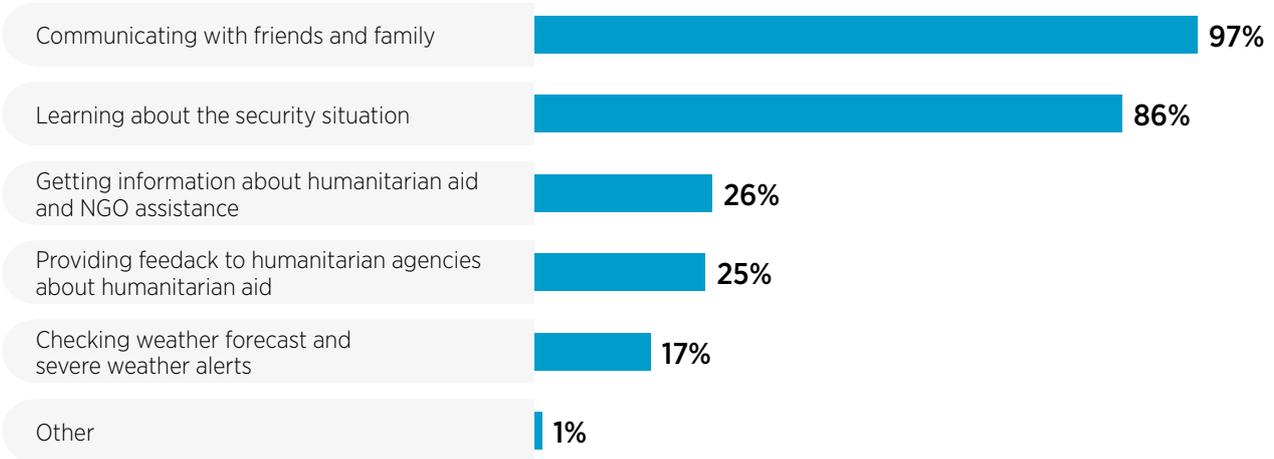
Everyone who said that they use a mobile phone (owned or borrowed) were asked what they use it for. This section presents the findings for use cases and services that do not require internet access and it does not look at mobile money.

Less than one per cent of respondents said that they did not use their phone to make and receive phone calls, and the majority also said they use their phone to send and received SMS messages (77 per cent).

Most mobile phone users in the sample reported using their phones to both communicate with loved ones and to monitor the security situation (Figure 8). Roughly a third of phone users (34 per cent) also reported using their phone to get information about and/or provide feedback on humanitarian aid, suggesting that at least some people are comfortable using their phones as a way to communicate with humanitarian organisations.

Figure 8

### Mobile phone use cases



Q: What do you use your mobile phone for? Base: Mobile phone users; n: 1,410

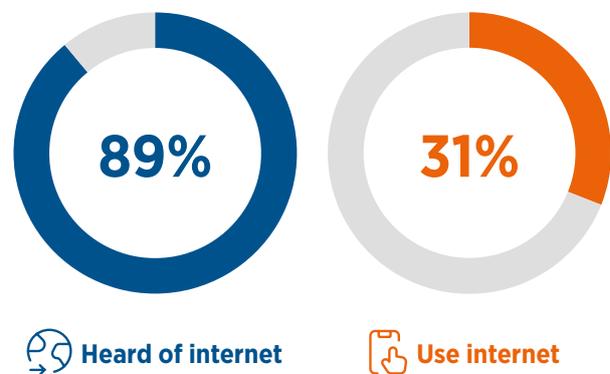
## Mobile internet

Most respondents (89 per cent), said that they had heard of the internet. The figures were similar for both those interviewed in person (85 per cent) and those interviewed over the phone (91 per cent).

This high level of awareness does not, however, translate into high levels of use. Among owners of internet-enabled mobile phones, 61 per cent that they use it to access the internet. This translates to **just three in 10 people using mobile internet on a phone that they own** (31 per cent). Unsurprisingly, nine in 10 smartphone owners reported using it to access the internet (90 per cent), a group which skews younger, male, Arabic speaking and without disabilities.

Figure 9

### Internet awareness and use



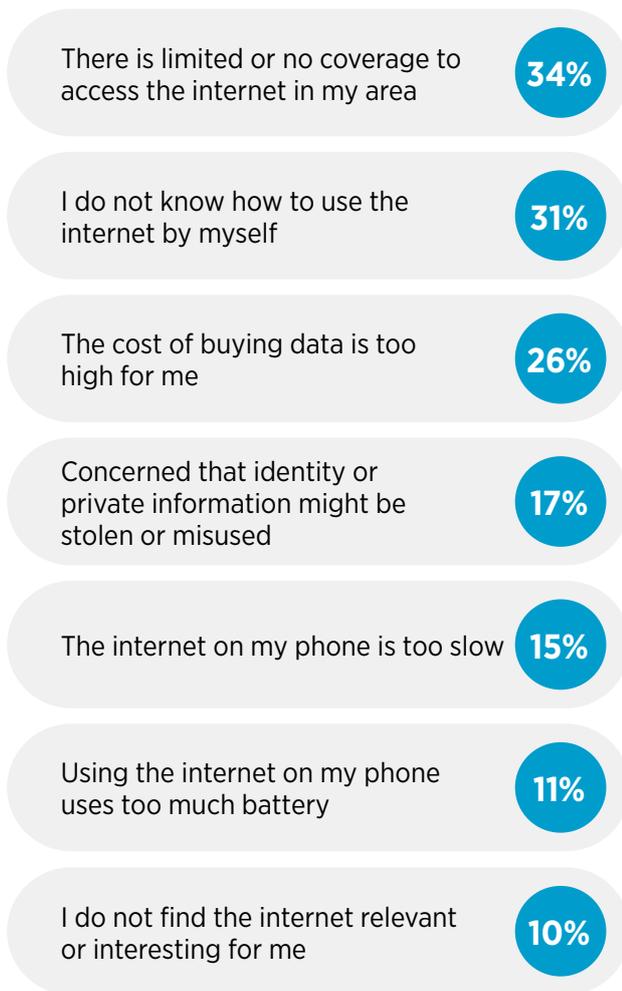
Q: Have you ever heard of the internet (apps, services, and websites like Facebook, WhatsApp, Messenger)? and Do you currently own a phone and use mobile internet?

Base: All respondents; n:1,527



Owners of internet-enabled handsets who were not using the internet were asked what was preventing them from doing so. Six barriers were selected by 10 per cent or more of respondents, with coverage, cost and digital literacy identified as the primary barriers (Figure 10).

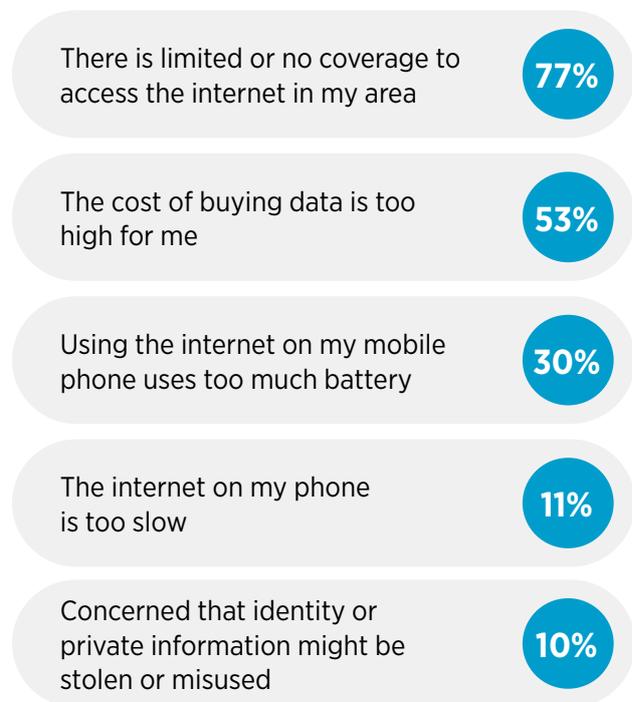
**Figure 10**  
**Barriers to mobile internet use**



Q: Which of the following reasons limit your use of mobile internet?  
Base: People with feature phones and smartphones who do not use the internet; n: 296

Only three in ten (30 per cent) of owners of internet-enabled handsets said they used the internet as much as they would like to, compared to 32 per cent who use it less than they would like and 38 per cent who do not use it at all. Those who used the internet less than they would like were asked what prevented them from doing so. Looking at those barriers cited by ten per cent or more of this group, it indicates that **availability of networks, the cost of data and charging are the most important barriers.**

**Figure 11**  
**Barriers limiting internet use**



Q: Which of the following reasons limit your use of mobile internet?  
Base: People who do not use the internet as much as they would like; n: IDP=116, Host community members= 132



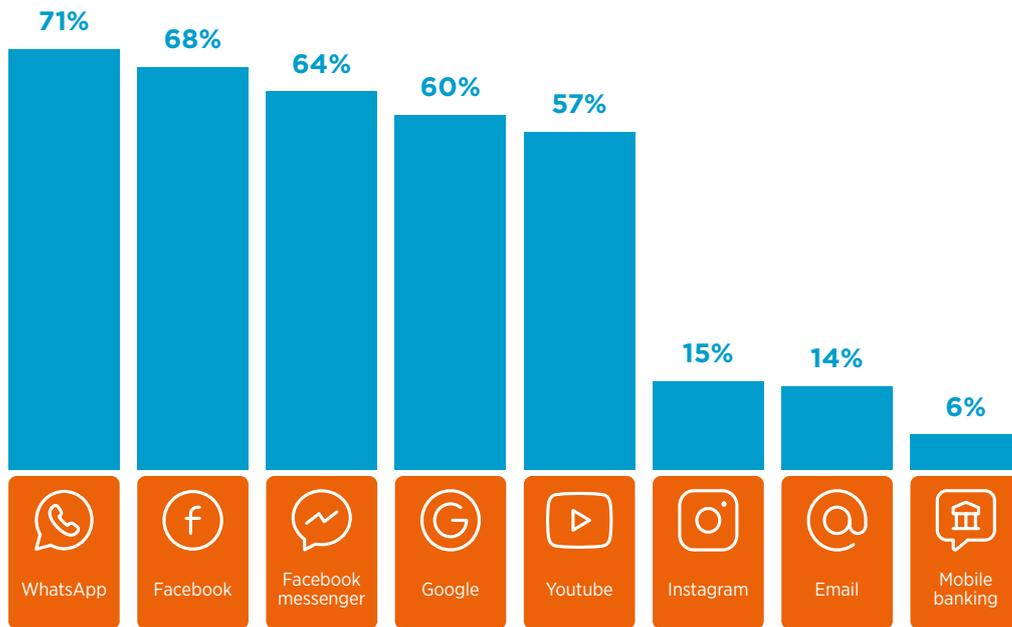
## Services and use cases

Internet users highlighted a range of online uses for their mobile phones, including messaging, video calling or talking with friends and family (69 per cent); sharing information and content over apps and social media (56 per cent); and consuming the

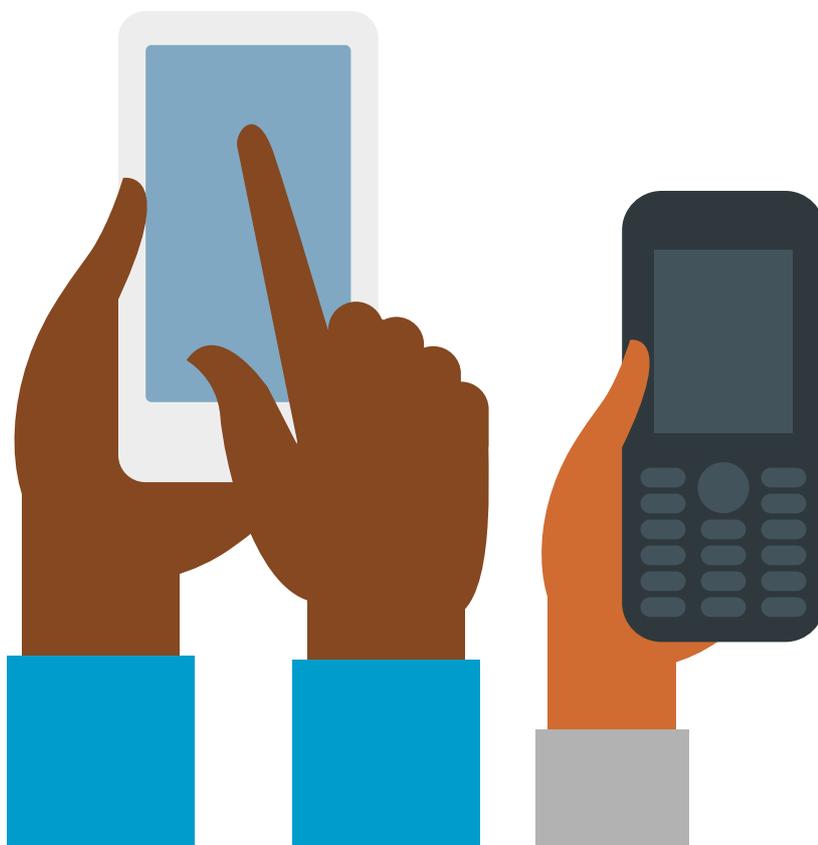
news (65 per cent). A minority also reported using the internet to access education (39 per cent) and searching for specific information on browsers (26 per cent).

Figure 12

### Use of internet-enabled services by feature phone and smartphone owners



Q: What do you use your mobile phone for?  
Base: Internet users; n: 771





## Internet access gaps

The survey data highlights notable differences in mobile internet awareness and use by gender, age and disability status.



### Gender gap

Women were 15 per cent less likely to have heard of the internet and 56 per cent less likely to use it than men (Figure 13).

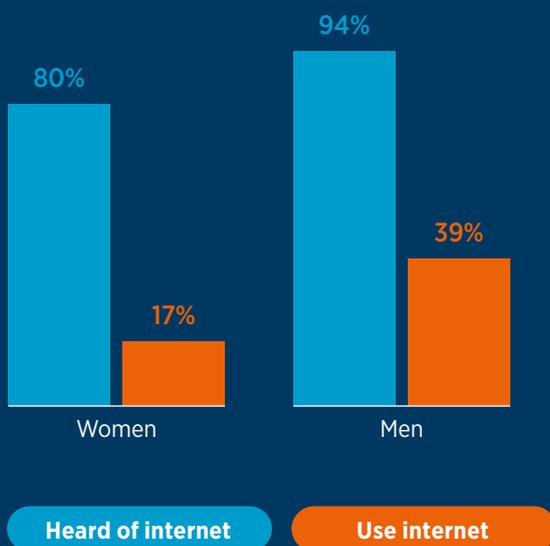


### Disability gap

Persons with disabilities were 22 per cent less likely to have heard of the internet and 32 per cent less likely to be using the internet compared to respondents who did not report having a disability (Figure 14).

Figure 13

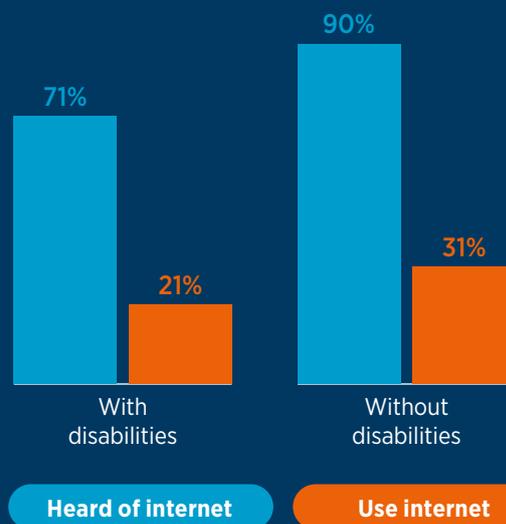
#### Internet awareness and use, by gender



Q: Have you ever heard of the internet (apps, services and websites like Facebook, WhatsApp, Messenger)? and Do you currently own a phone and use mobile internet?  
 Base: All respondents; n: Women=681, Men=574

Figure 14

#### Internet awareness and use, by disability status



Q: Have you ever heard of the internet? and Do you currently own a phone and use mobile internet?  
 Base: All respondents; n: Persons with disabilities=94, Persons without disabilities=1,452



## Age gap

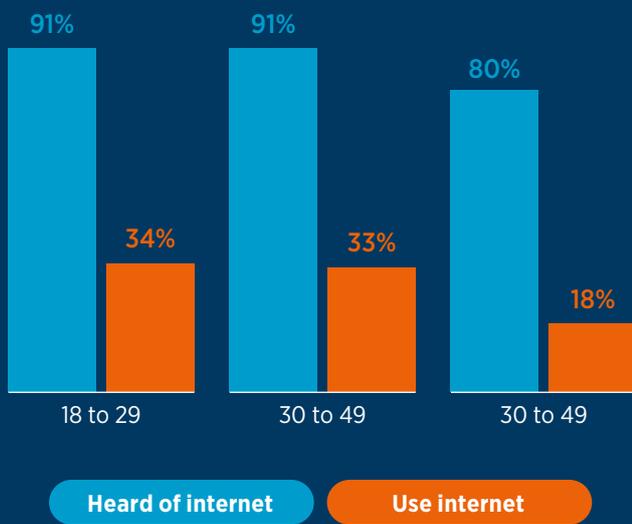
Older people (those aged 50 and above), were 12 per cent less likely to have heard of the internet and 45 per cent less likely to be using it than respondents aged between 18 and 49 (Figure 15).



## Language gap

There was no notable difference in awareness and use of mobile internet based on the primary language spoken.

Figure 15  
Internet awareness and use, by age





## Mobile money

Very few people who were mobile phone users reported using mobile money; just one per cent of survey respondents. However, the research revealed potential unmet consumer demand, given that roughly two-thirds of phone users (68 per cent) reported sending and receiving phone credit between friends and family as a form of money transfer.

While phone credit functions similarly to mobile

money for the user, it is an informal workaround that does not have consumer protections or the potential for financial inclusion built in. There are also barriers for users, such as a legal daily cap on transfers of SDG 1,000<sup>13</sup> (\$2.24). For mobile money to succeed in these communities, awareness-raising and sensitisation efforts would be needed. Ninety per cent of mobile phone users who do not use mobile money were not aware that the service existed.

## Trust and concerns

As humanitarian organisations consider how to use digital services to deliver information and assistance, it is essential that they understand the concerns that communities have about the information they receive through digital channels.

Asked about several possible concerns, respondents were most likely to say that they were concerned about “being a target of a scam or other unfair

practice through your mobile phone” (58 per cent); “receiving wrong information or fake news” (43 per cent); and “using the internet or a mobile phone could be harmful for children in your household” (28 per cent).



13 As reported by merchants who were interviewed in a concurrent assessment in White Nile.



# Digital ecosystem

An essential part of using mobile and digital services in humanitarian settings is a well-functioning digital ecosystem, including the availability of networks, ability to charge devices, provision of services by agents and merchants and much more.<sup>14</sup> This section highlights assessment results related to the digital ecosystems in the research settings in West Darfur.



<sup>14</sup> Baah, B. and Hamilton, Z. (2021). Building and strengthening digital ecosystems in humanitarian contexts.

## Mobile networks

MNOs are a vital service provider and essential for the use of mobile technology. This section highlights the availability and use of Sudan's three MNOs in the research locations.

### Network coverage

This assessment uses data from the end user survey as well as signal strength mapping to assess the availability of networks in each research location (see Annex 2: Methodology). However, due to security constraints in West Darfur, it was not possible to conduct signal strength mapping systematically and had to be adapted. Still, researchers were able to take 13 signal strength measurements in four locations (El Geneina, Jebel Moon, Krindig and Misteri) and from all three operators.

From these 13 measurements researchers were able to get signal, send an SMS, make a clear phone call, and receive data in every single one. The survey data also suggested that there was a good degree of network coverage to enable the making and receiving of calls in all the research locations (which were urban centres, so it is likely that this does not extend into rural areas).

### Customers

All mobile phone owners were asked which of the three Sudanese MNOs they were a customer of. Interestingly, across the sample only 55 per cent said they were a customer of just one, with 34 per cent a customer of two and 11 per cent of all three. MTN had the largest share, with 83 per cent. Both Zain and Sudani had 36 per cent of customers.

Researchers were able to use WhatsApp to send a message for twelve of the thirteen measurements and make a clear voice call over for eleven. They were able to stream a YouTube video for seven measurements (four of which were in El Geneina and none of which in Jebel Moon). This indicates availability of mobile internet is more sporadic in West Darfur outside of the more urban capital, but there is still a fair spread of availability in the locations measured (important to note that none of these were in particularly rural areas). One exception was Jebel Moon, where internet coverage was unreliable and seemed to vary depending on the time of day; this is likely related to when community members most regularly access the internet and use up bandwidth.

There were notable differences by the location of the interview, which likely corresponds with the availability of networks and merchants for each of the operators.



## Merchants and agents

Forty-four merchants and agents who provide mobile products and services in the research locations were interviewed as part of this assessment. Excluding three large outliers (200, 275 and 300), agents reported serving an average of 47 customers a day. Across all locations, they serve a mix of IDP and host community customers and provide a range of enabling services to help them stay connected.

### Airtime and credit

The most common service provided by merchants is airtime sales, which enable customers to top up their balance. This is clearly an important service, as nearly all mobile phone owners (99 per cent) reported topping up directly with an agent or via a scratch card, which would also have been purchased from a merchant. None of the agents interviewed reported providing mobile money services.

### Problem solving

As in many settings, merchants and agents in West Darfur are a key resource for solving customer issues with mobile phones. Most of the agents interviewed reported teaching people how to use their handsets, talking them through how to top up their balance and replace SIM cards and batteries. A few agents mentioned providing more advanced services, such as repairing handsets, which is important for extending the life of mobile phones and helping people stay connected for longer, especially where the price of handsets is seen as a barrier to digital inclusion as in West Darfur.

### Charging

Of the 44 merchants interviewed, 29 said they provided charging as part of their business. This is important in these locations as **only 25 per cent of phone users can reliably charge at home.**

### Sales

Fewer than half of agents reported selling handsets as part of their business, which is not surprising given that demand for a new handset is likely to be lower than for services that a mobile phone user would access regularly. Similarly, fewer than half reported selling SIM cards, but this is likely low since regulation in Sudan requires SIM cards to be registered at a specific location that was outside the research sites.

## Digital humanitarian services

Humanitarian organisations and other providers of vital services can play a key role in the development of digital ecosystems as they can enable the development and deployment of digital products and services.<sup>15</sup> The end user survey indicated that people are using their phones to some extent to engage with humanitarian organisations

(25 per cent of phone users said they use their phone to get information related to humanitarian assistance and 26 per cent to provide feedback to providers of aid). However, as access to and use of mobile phones is relatively high amongst these groups, it seems there is an opportunity to increase these figures.

<sup>15</sup> Baah, B. and Hamilton, Z. (2021). Building and strengthening digital ecosystems in humanitarian contexts.

# Conclusions and recommendations



## Mobile phone ownership

### Conclusion

Individual access to phones is high in West Darfur. However, access to internet-enabled phones, especially smartphones, is notably lower among women, older people, persons with disabilities and those who do not speak Arabic as their primary language. Overall access to internet-enabled phones, especially smartphones, remains low. The main barrier people face to owning a mobile phone is cost, however, digital literacy and network coverage also are significant barriers.

### Recommendations

**Humanitarian organisations** should investigate ways in which they might enable traditionally marginalised groups to own smartphones or smart feature phones<sup>16</sup>. This should be done in partnership with **local private sector actors** and **donors** should be open to financing new solutions which make access easier.

Past solutions have included long-term financing models where people can make small, regular payments to pay off a handset over time. However, this model has been found to be less suitable for low-income or rural segments.<sup>17</sup> **Humanitarian organisations** could also look at creating partnerships with local device suppliers to design handset distributions that support those most in need without adversely impacting local businesses selling handsets. This would likely involve detailed mapping of the existing market.

All solutions should ensure that handsets are suitable for the context in which they will be used (for example, being confident that batteries will not swell in the heat and render the phone unusable).

<sup>16</sup> Smart feature phones provide a more affordable alternative to smartphones. While they do not have the full capabilities of a smartphone and retain the form factor of a feature phone, they typically support popular apps, such as YouTube and Facebook.

<sup>17</sup> Carboni, I. (2022). *M-KOPA: Applying the pay-as-you-go model to smartphones in Africa*. GSMA.



## Charging

### Conclusion

Very few people have access to charging at home, making them reliant on the availability of other solutions, such as merchants with charging stations in the local market. Knowing that many people in the sample are sensitive to the cost of mobile phones, it is likely that energy solutions will need to heavily tailor their business and finance models to adequately support these groups.

### Recommendations

Providers of off-grid energy solutions should investigate whether they could bring existing services such as pay-as-you-go (PAYGo) solar home systems into West Darfur. Similar services have demonstrated commercial sustainability in other displacement contexts in Africa.<sup>18</sup> **Humanitarian organisations** and **donors** can work on encouraging market expansion with market-based programming that both enhances population access and information for these providers.

**Humanitarian organisations** should identify potential partnerships with energy service providers to tailor their programming to suit the needs of displacement-affected communities. Partnerships can lead to adaptations of payment plans, for example, Altech in the Democratic Republic of Congo, are investigating how removing down

payments might increase access and uptake of solar home systems in camps hosting Burundian refugees.<sup>19</sup>

**MNOs** and **humanitarian organisations** might work together to expand the number of multi-purpose merchants that can provide affordable charging solutions in marketplaces. This can be done through incentives and subsidies for strong agents that partner with humanitarian organisations and provide alternate energy solutions for clients as well as certain digital literacy and product sensitization campaigns.

**Donors** might consider providing some humanitarian funding to reduce the costs of innovative energy solutions for low-income customers and potentially marginalised groups in displacement-affected communities.

<sup>18</sup> Casswell, J. (2019). *Mobile-enabled energy for humanitarian contexts: The case for pay-as-you-go solar home systems in Kakuma Refugee Camp*. GSMA.  
<sup>19</sup> GSMA. (2022). *Mobile for Humanitarian Innovation Fund: Portfolio 2017–2022*.



## Digital literacy

### Conclusion

Digital knowledge and skills are a key barrier to accessing and using both mobile internet and mobile money services. If this barrier is not tackled it is very likely they will present a barrier to any future digital humanitarian services.

### Recommendations

**Humanitarian organisations** and **MNOs** should investigate ways to collaborate on delivering regular and comprehensive digital skills training that is tailored to the local context, focuses on the needs of the most marginalised groups and leverages existing community networks, such as mobile agents.<sup>20</sup>

The GSMA Mobile Internet Skills Training Toolkit (MISTT), a set of free resources to teach people the basic skills they need to access and use mobile internet, could provide a foundation for this work.

The toolkit uses a train-the-trainer approach that could be used by local networks.<sup>21</sup>

**Service providers** could investigate how to galvanise existing services to offer digital skills training. In Uganda, where a Grameen Foundation programme helps people set up a new mobile money business, participants are required to train 100 community members in digital financial skills before they receive start-up capital and business skills training.<sup>22</sup>



## Mobile money

### Conclusion

Mobile money use is very low, with the main barrier being that people are simply unaware of specific services. However, given that a large proportion of people reported sending credit as a P2P transfer indicates there is potential unmet demand for mobile financial services.

### Recommendations

**Mobile money providers** should investigate how they might raise awareness and expand service provision into West Darfur. Although none of the agents interviewed reported providing mobile money services, they are likely to be some of the best placed to encourage mobile money uptake and provide skills training. This, in turn, may help drive demand for formal financial services. As demand increases, providers might consider how tailored products and services may maximise potential commercial benefits from new users.

**Humanitarian organisations** should collaborate with **mobile money providers** to support communities they serve in West Darfur to learn about and adopt mobile financial services. This could either be part of

a sensitisation campaign for cash programming or a standalone financial inclusion effort. In Somaliland, when voice identification was being introduced to existing cash programming, CARE and Telesom found that combining sensitisation with registration and providing ongoing recorded instructions were effective at building the digital skills of cash recipients.<sup>23</sup> This would likely need to be combined with ongoing training support when people are being introduced to an entirely new service.

**Humanitarian organisations** and **mobile money providers** will need to continue working together as services expand to understand and ensure products are tailored to the specific needs and preferences of people in need of humanitarian assistance.

20 Downer, M. (2021). "Digital skills development for equitable and dignified humanitarian assistance." *ITU Digital Skills Insights 2021*. ITU.

21 GSMA. *Mobile Internet Skills Training Toolkit*.

22 Downer, M. (2021). "Digital skills development for equitable and dignified humanitarian assistance." *ITU Digital Skills Insights 2021*. ITU.

23 GSMA. (2021). *Verifying recipients of cash assistance through Voice ID: Pilot project lessons and outcomes*.



## Communicating with communities

### Conclusion

Most people reported knowing how to use mobile phones for calling and using USSD, and around half also knew how to send and receive SMS messages. Additionally, a sizeable minority of phone owners reported already using their phone to interact with humanitarian organisations about current or potential assistance. This demonstrates there is potential for humanitarian providers to increasingly engage with service users in this way. It was also clear that people are wary of information they receive on social media, as they are aware of issues related to disinformation.

### Recommendations

**Humanitarian organisations** should investigate other ways to use calls and USSD to communicate with the communities they serve. One way to reach people through voice calls might be through interactive voice response (IVR) technology, which NRC is using as part of their Digital Community Hub (DCH). People can call a toll-free line and listen to pre-recorded audio messages in English, Arabic, Tigrinya and Amharic, and navigate the IVR using their mobile phone keypad to access information on legal civil documentation or leave a voice message requesting additional information or details. This is being used alongside other channels such as SMS.

It may also be appropriate for certain groups to use SMS or WhatsApp, although it is important to ensure that alternative channels are available for those who do not already use these channels.

Like any communication effort, **all stakeholders** will need to understand individuals' broader communication and information needs to determine the best way to contact them and to ensure they trust the information being provided.



## Network coverage

### Conclusion

While it appears that overall network coverage in West Darfur is good, several people identified existing coverage as a barrier to greater digital inclusion. Outside of El Geneina, internet connectivity was found to be patchy at times (especially in Jebel Moon), and it is likely this increases in more rural areas that researchers were not able to access.

### Recommendations

**MNOs** operating in Sudan already have systematic approaches to extending their coverage that consider unmet customer demand. They might also consider investigating whether they could expand coverage to areas where humanitarian organisations are interested in delivering assistance digitally.

**Humanitarian organisations** should engage with **MNOs** to discuss needs and, as much as possible, pool demand to make a commercial business case for expanded coverage. Where this is not possible, donors or **development finance institutions** might investigate how they could provide de-risking capital to support expansion into areas where the potential for commercial sustainability is less evident.

# Annex 1: References

**Baah, B. and Hamilton, Z. (2021).** Building and strengthening digital ecosystems in humanitarian contexts.

**Baah, B., Downer, M. and Kruk, L. (2020).** Humanitarian Connectivity Needs and Usage Assessment (CoNUA) Toolkit. GSMA.

**Carboni, I. (2022).** M-KOPA: Applying the pay-as-you-go model to smartphones in Africa. GSMA.

**Casswell, J. (2019).** The Digital Lives of Refugees. GSMA.

**Casswell, J. (2019).** Mobile-enabled energy for humanitarian contexts: The case for pay-as-you-go solar home systems in Kakuma Refugee Camp. GSMA.

**Caswell, P. and Downer, M. (2022).** Digital Access and Barriers in Displacement-affected Communities in White Nile, Sudan. GSMA and NRC.

**CLEAR Global. (n.d.). CLEAR Tech.** Available at: <https://clearglobal.org/clear-tech/> (accessed 28 April 2022).

**Downer, M. (2021).** “Digital skills development for equitable and dignified humanitarian assistance.” ITU Digital Skills Insights 2021. ITU.

**GSMA. (2021).** Verifying recipients of cash assistance through Voice ID: Pilot project lessons and outcomes.

**GSMA. (2022).** Mobile for Humanitarian Innovation Fund: Portfolio 2017–2022.

**GSMA Intelligence.** Data by market (Sudan). Available at: <https://data.gsmaintelligence.com/data/market-metrics> (accessed 4 April 2022).

**GSMA. (2021).** The Mobile Gender Gap Report 2021.

**GSMA.** Mobile Internet Skills Training Toolkit. Available at: <https://www.gsma.com/mobilefordevelopment/mistt/>.

**REACH Initiative. (2020).** Sudan 2020 Multi-sector Needs Assessment: Final Report.

**UN OCHA. (2022).** West Darfur State Profile – March 2022.

**UN OCHA. (2021).** Humanitarian Needs Overview: Sudan.

**Washington Group on Disability Statistics. (2020).** The Washington Group Short Set on Functioning (WG-SS).



# Annex 2: Methodology

## End user survey

The end user survey used a tailored version of the tool provided in the CoNUA toolkit, which considered both the local realities and the priorities of NRC. This was coded into Kobo and used to collect data in January 2022.

Due to security and access issues and the lack of formal IDP registration, the sampling frame was created through multiple approaches. Random sampling was possible in El Geneina and Krinding by randomly selecting IDP settlements and neighbourhoods to sample from, however, NRC still relied on community leaders and government representatives to provide guidance, as they did for all locations. In El Geneina and Krinding, staff were able to conduct interviews in person, however, the list and sampling population were identified through focal points. For all other areas, surveys were primarily conducted over the phone.

To mitigate the quality issues that can arise with remote assessments, NRC decided to also include a recall sampling group. This recall group consisted of

individuals living in El Geneina who were originally from the administrative units targeted. Through a recall version of the CoNUA assessment, this group represented the host community population. Additionally, NRC requested focal points in remote locations such as Jebel Moon and Kereneik to identify respondents without a phone and to provide them with a phone temporarily, so NRC staff could conduct the interview.

Since reliable demographic data on populations was not readily available, the final sample has not been assessed for representativeness (Table 4). However, the sample is skewed male.

There had been an intention to draw analytical distinction between internally displaced people and the host community, however it became increasingly clear that this would be a meaningless distinction when understanding their experiences both of displacement and access to digital technology, so the sample was ultimately treated as one group.



Table 4

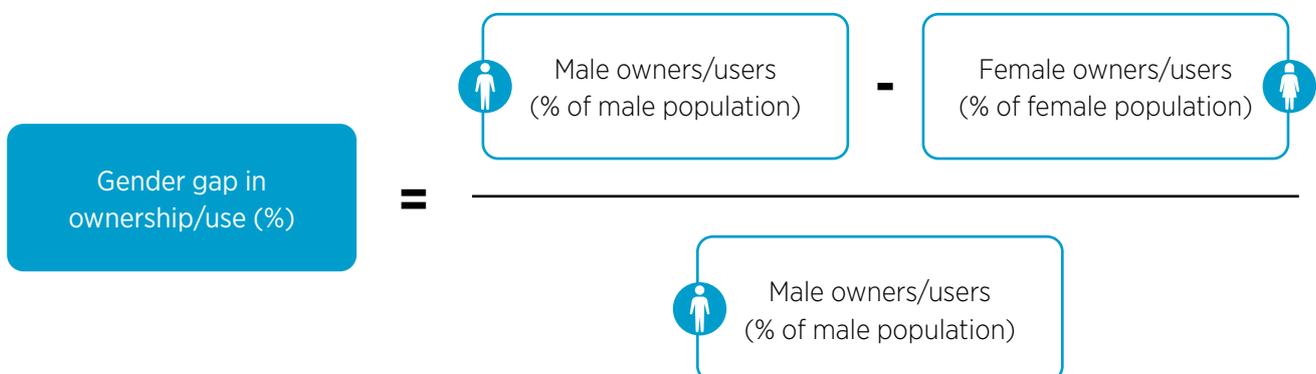
**Demographics of samples**

		In person	Phone	Total
<b>Gender</b>	Male	49%	71%	63%
	Female	53%	69%	61%
<b>Disability status<sup>24</sup></b>	with a disability	11%	4%	6%
	without a disability	89%	96%	94%
<b>Age</b>	18 to 29	36%	34%	35%
	30 to 49	44%	51%	49%
	50+	20%	16%	17%
<b>Main language spoken at home</b>	Arabic	24%	27%	26%
	Masalit	69%	56%	61%
	Mesiria	5%	10%	8%
	Other	2%	7%	5%

All questions in the survey were voluntary and respondents could choose not to answer any of the questions. This means that questions have fluctuating base sizes depending on whether individuals chose not to answer. Most of the analysis is based on those who provided an answer.

This report pays close analytical attention to patterns of digital exclusion, conducting analysis of groups traditionally at higher risk of being excluded, including women, older people, persons with disabilities and those who speak a minority

language. Often, this analysis is presented by sizing “gaps”, such as the “mobile gender gap” or “mobile disability gap”. Each gap is presented as how much less likely a member of a potentially marginalised group is to own/access a mobile phone compared to those outside the group. For example, a mobile age gap can show how much less likely an older person is to own a mobile phone than a younger person. This assessment uses the Washington Group Short Set of Questions (WGQs) to identify people with a disability.<sup>25</sup>



24 Disability was determined based on the Washington Group Short Set of Questions. Anyone who answered “a lot of difficulty” or “cannot do” to any of the questions were analysed as a person with a disability.

25 Washington Group on Disability Statistics. (2020). [The Washington Group Short Set on Functioning \(WG-SS\)](#).



## Merchant interviews

Using the CoNUA tool, this assessment collected quantitative data from merchants that provide mobile services (such as airtime sales or charging services) across the six locations. Using an interview to collect structured data, this exercise identified the types of services available, with customers helping to create a picture of the market in each of the

locations. This exercise uses convenience sampling of merchants who were operating at the time of data collection and willing to speak to researchers. As such, it is not necessarily a comprehensive mapping of service availability, but an indicative understanding of the state of commercial service provision in the research locations.

## Signal strength mapping

The assessment used the CoNUA signal strength mapping tool to assess the availability of mobile networks in each of the six research locations. At a central location, such as a marketplace, and using a SIM card from each of Sudan's three MNOs (MTN, Sudani and Zain), researchers attempted to send an **SMS**, make a **phone call**, send a **WhatsApp message**, make a **WhatsApp call** and stream a **YouTube video** and then recorded whether it

was successful. Although an indicator of network availability, it is a relatively crude one as it does not account for variable access in each location outside the central marketplace, and does not consider atypical outages or disruptions experienced at the time.

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