CONNECTIVITY FOR REFUGEES

Inclusive Digital Economy Alliance

Access and barriers to connectivity and digital work for refugees and host communities in Rwanda

A Connectivity for Refugees and Inclusive Digital Economy Alliance initiative: Results of a mobile network coverage mapping, connectivity needs and usage survey, and focus group discussions on digital work across refugee camps and hosting communities in Rwanda.

2026

Connectivity for Refugees Initiative[1]

Connectivity for Refugees is a multi-stakeholder initiative launched at the 2023 Global Refugee Forum by UNHCR, GSMA, ITU, and the Government of Luxembourg. The initiative is advancing the availability and affordability of connectivity for 20 million forcibly displaced people and their host communities by 2030 with partners across sectors, industries, and geographies. Connectivity for Refugees prioritizes a market-based approach to improve both individual connectivity (via a personal device) and communal connectivity (via publicly shared devices), as well as combinations of the two.

Inclusive Digital Economy Alliance (IDEA)

The Inclusive Digital Economy Alliance (IDEA) is a global initiative led by UNHCR to expand access to dignified work in the digital economy for forcibly displaced people and their host communities. The initiative aims to strengthen pathways from learning to earning by improving access to market-relevant skills, enabling services, and income opportunities, while addressing key barriers to participation and supporting scalable, inclusive models.

1 Homepage | UNHCR - Connectivity for Refugees

This report was developed through the close collaboration of partners under Connectivity for Refugees (CfR) and Inclusive Digital Economy Alliance (IDEA), both global efforts to advance digital inclusion for forcibly displaced persons and host communities.

The assessment and its findings were made possible through the leadership of the Rwanda Ministry in Charge of Emergency Management (MINEMA) and United Nations High Commissioner for Refugees (UNHCR), in partnership with the GSMA, International Telecommunication Union (ITU), Ericsson Response, and ALIGHT Rwanda.

This report was written by:

- Kyla Reid, *Principal, KPHR Inc.*
- Olly Parsons, *Senior Consultant, KPHR Inc.*
- Liddy Greenaway, *Subject Matter Expert (Data Analysis), KPHR Inc.*
- Amy Fallon, *Associate Innovation Officer (Inclusive Digital Economy Alliance), UNHCR*
- Betty Wang, *Associate Innovation Officer (Connectivity for Refugees), UNHCR*

The assessment would not have been possible without valuable input from:

- Marcellin Mugabe, Evanson Njoroge Miruru, Matthew Downer, John Warnes *(UNHCR)*
- Frederic Nshizirungu, Patrick Byishimo *(ALIGHT Rwanda)*
- Lars Ruediger, Lova Hallberg, Seán Holland, Lars Peder Svensson *(Ericsson Response)*
- Jacques Kabandana *(Ericsson Rwanda)*
- Vanessa Gray, Paul Hamilton *(ITU)*

This report also draws upon desk research conducted by Accenture on behalf of UNHCR and the Connectivity for Refugees initiative in 2024.

This report was designed by Kiunga Isaac, *UNHCR*.

This report was made possible thanks to Government of Luxembourg's support to CfR and ARM's support to IDEA.

Contents

Foreword **1**

Executive Summary **3**

Introduction **11**

Methodology **15**

Findings **18**

Conclusions and Recommendations **41**

Annexes **45**

Annex A: Methodology 45

Annex B: Connectivity Needs and Usage Survey Respondent Demographic Breakdown 47

Annex C: Limitations on Assessment Approaches 50

Annex D: Digital Divides by Camp 51

Annex E: Undertaking Digital Work, with Detailed Gender Breakdown 52

Foreword

Maj. Gen (Rtd) Albert Murasira
Minister, Ministry in Charge of Emergency Management (MINEMA)

Rwanda remains steadfast in its commitment to the protection and socioeconomic inclusion of refugees and asylum seekers. As the Ministry responsible for refugee management and emergency response, MINEMA works to ensure that refugees are not only safe, but supported, with access to education, livelihoods, financial services, and national systems on equal terms with Rwandans. This commitment sets the foundation for MINEMA and UNHCR's joint efforts to advance economic inclusion of refugees, including strategies to transition refugees from humanitarian assistance to lasting self-reliance and productive participation in Rwandan society. Digital inclusion is increasingly central to that journey. As Rwanda's digital transformation accelerates, we are committed to ensuring that refugee-hosting areas are not left behind and are active beneficiaries in the opportunities it creates.

That ambition must be matched by evidence. Made possible through the collaboration of UNHCR, Ericsson Response, ALIGHT Rwanda, and other partners, this report offers the clearest picture to date of connectivity access, usage, and digital opportunity for refugees and host communities alike.

The findings are illuminating and confirm real progress: high mobile penetration, high phone ownership, and growing digital engagement across refugee-hosting areas. They also reveal persistent gaps in coverage quality, device and data affordability, digital skills, and access to the reliable connectivity that digital work demands.

For MINEMA, these findings deepen our resolve to advance digital inclusion in refugee-hosting regions. For ministries, the private sector, civil societies, and development partners, this report provides a shared evidence base to guide where digital investments, interventions, and programs will have the greatest impact.

I invite all readers to engage with these insights and recommendations and to join us in translating them into coordinated action so that Rwanda's digital transformation leaves no one behind.

Ms. Ritu Shroff

Representative, UNHCR Rwanda

Rwanda hosts a significant and long-established refugee population, many of whom have lived in the country for decades. UNHCR's mandate here encompasses their protection, the safeguarding of their rights, and support for durable solutions that enable self-reliance and dignified lives. It is within this context that digital inclusion has emerged as an increasingly critical dimension of our work.

The evidence of opportunity is visible across refugee-hosting areas. In Kigali and across the camps, UNHCR and partners know that refugees are already leveraging digital tools to connect, learn, and earn income through remote work, coding, content creation, and more. Stories like that of Lydie, a Burundian refugee who, following digital skills training supported by UNHCR and Prison Fellowship Rwanda, now helps fellow community members access jobs and scholarships online, illustrate what becomes possible when investment in connectivity access and digital skills reaches refugee hosting areas. Rwanda's own digital transformation agenda and its progressive policy environment for refugees create genuine conditions for increased and meaningful participation in the digital economy.

This report serves as a critical evidence base to guide those investments, combining network coverage mapping, a connectivity survey across all five refugee camps and urban Kigali, and focus group discussions (FGD) on digital work. The finding that nearly one in five refugee FGD participant has undertaken paid digital work in the past year is significant, so too are the gaps identified in skills, device access, and connectivity that prevent many more from doing the same.

UNHCR, in partnership with MINEMA and all who contributed to this assessment, presents this report as a shared resource. The opportunity is clear. What is needed now is coordinated action across government, the private sector, development actors, and community organizations to turn these findings into meaningful change for refugees and the communities that host them.

Executive Summary

Rwanda hosts more than 137,000 refugees and asylum seekers, many of whom have been in the country for decades.[2] 90% of refugees reside in five camps: Kiziba, Nyabiheke, Kigeme, Mugombwa, and Mahama.[3]

The Government of Rwanda (GoR) has established a progressive legal and policy environment for refugees, affording them the rights to work, education, access financial services, and other measures to encourage active participation in Rwandan society.[4] In parallel, the GoR has made significant investments in digital infrastructure and inclusion, guided by Vision 2050, the National Strategy for Transformation, and the 2024–2029 ICT Sector Strategic Plan.[5] [6] [7] The country has already achieved 98% 4G population coverage nationwide, with 5G already live in select areas.[8] At the intersection of these two agendas lies a growing opportunity: digital inclusion and digital livelihoods as pathways to self-reliance for refugees and the host communities who live alongside them.

The report presents the findings of three assessments: a mobile network coverage mapping exercise carried out across all five refugee camps; a connectivity needs and usage survey covering all five camps and urban Kigali; and focus group discussions (FGDs) on digital work and livelihoods held in Mahama, Nyabiheke, and Kigali. The findings in this report aim to build the evidence base to better understand the connectivity landscape, including opportunities in the digital economy, for refugees and their host communities in Rwanda.

Note: The connectivity needs and usage survey sample was designed to reflect the demographic profile of the refugee population in Rwanda, with location, gender, and age distributions closely matched to official population data across the six surveyed sites. While the sample is representative at a national level for the refugee population, ensuring representative samples in every individual location would require significant additional capacity. As such, disaggregated location data is presented as some interesting differences by location found, which could warrant further exploration with other evidence, but caution is advised against using this data alone for specific location-based recommendations (particularly related to host communities).

2 https://data.unhcr.org/en/documents/details/121038
3 Ibid.
4 Rwanda National Strategy for Sustainable Graduation
5 Republic of Rwands The National Digital Inclusion Strategy p 8
6 Republic of Rwanda Vision 2050 Abridged Version
7 Ministry of ICT and Innovation ICT Sector Strategic Plan (2024 – 2029)
8 2025 – GSMA Mobile Connectivity Index (accessed February 2026)

Mobile Network Coverage

3G and 4G coverage in refugee-hosting areas is broadly available but its quality falls short of the national average. Rwanda's two mobile network operators, MTN and Airtel, achieve an estimated **98%** population coverage with 4G nationally.[9] However, the coverage mapping exercise reveal that average download speed across the five refugee camps is **21.72 Mbps**, around **75%** of Rwanda's national average of **27.0 Mbps**, with performance varying significantly between camps (**Figure 1**).

Figure 1: **3G and 4G coverage, by camp.**

Location	Download speed (Mbps)	Upload speed (Mbps)	Latency
Kigeme	33.6	16.3	54.3
Kiziba	26.3	7.8	55.5
Mahama	11.2	6.9	51.4
Mugombwa	12.4	6.1	59.9
Nyabiheke	17.4	6.0	51.7
Average for Refugee Camps	**21.7**	**8.6**	**53.6**
Rwanda Average for Rwanda	**27.0**	**9.0**	**43.7**

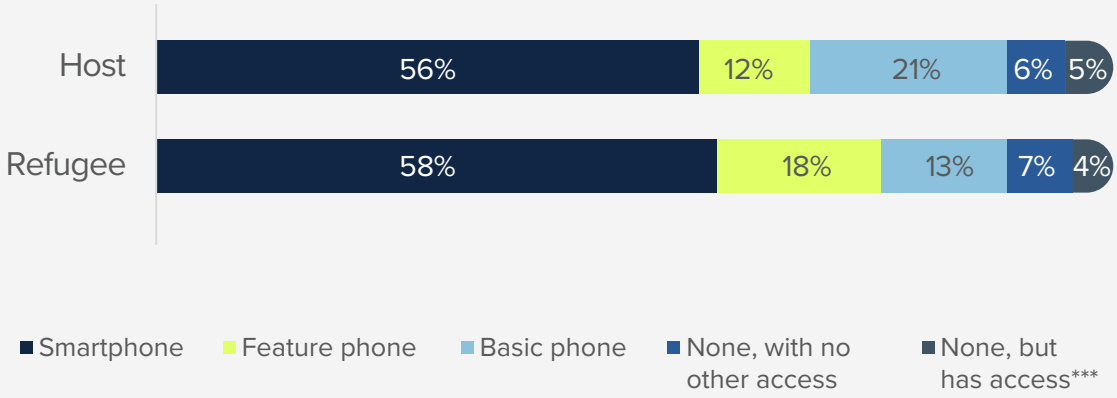
Kigeme performs above the national average; Kiziba provides adequate but uneven coverage across the refugee hosting area; Mahama, Mugombwa, and Nyabiheke are materially underserved. This variation is driven by a combination of factors including terrain, distance from towers, and radio antenna orientation, all of which affect the strength and reliability of signal reaching residents in refugee-hosting areas.

9 2025 – GSMA Mobile Connectivity Index (accessed February 2026)

Phone Ownership

Phone ownership is high and broadly comparable across communities. 89% of all respondents, refugees and host community alike, reported owning a phone of some type, with 58% owning a smartphone (**Figure 2**). Unlike many refugee contexts, there is no significant gap in phone ownership between refugee and host community respondents.

Figure 2: **Individual phone ownership, by status**



What kind of phone(s) do you personally own? (n=1,988; all respondents)
* May also have a basic phone.
** May also have basic and/or feature phones.
*** Has access to a phone via friends or family, or at a community centre.

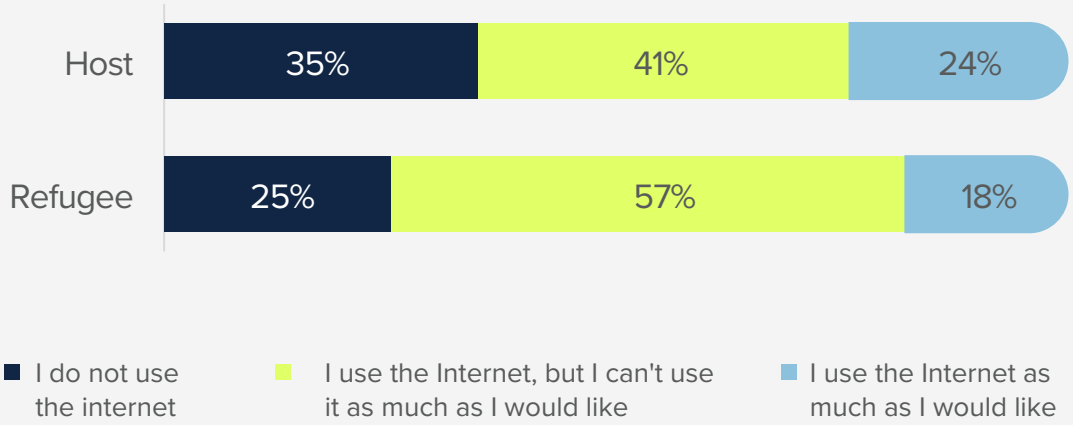
However, there are important disparities within communities. Women are less likely to own smartphones than men (55% vs. 61%) and are more likely to rely on basic phones. Among those over 50, usage drops sharply as 27% report never using a phone at all.

Cost is the dominant barrier to ownership. The upfront cost of a handset, the ongoing cost of airtime, and the expense of charging were top issues cited among both refugee and host communities, though in each case by a high proportion of refugees. While not among the top identified barriers, refugees were also significantly more likely to identify ‘limited or no network coverage in my area’ as a barrier than the host community (11% compared to just 2%).

Internet Access and Use

Awareness of the internet is high, but meaningful use remains constrained by cost, coverage, and confidence. 81% of all respondents have heard of the internet (**Figure 3**). The majority of refugees (57%) use the internet less than they would like, with only 18% able to access it as much as they need to. These figures may suggest that while refugees are largely aware of the internet, they may be consistently constrained in their ability to use it fully.

Figure 3: **Internet usage, by status**



When it comes to internet usage, cost is the defining barrier. 31% of refugees cite the cost of mobile data as a constraint, significantly more than host community members (22%), and 21% identify the cost of an internet-enabled handset as a barrier. Slow speeds, limited coverage, and skills gaps follow closely.

Wi-Fi access remains limited, with only 31% of all respondents able to access it anywhere. Where it is available, it is most commonly found at schools (17%) and workplaces (11%), with just 10% reporting home access.

Gender and age shape who gets online. Men are more likely than women to have heard of the internet (84% vs. 79%) and to have Wi-Fi access (35% vs. 28%). The age divide is more stark: while 87% of those under 50 have heard of the internet, this falls to just 53% among those over 50, reinforcing a pattern of older residents being systematically less connected across every dimension of digital access.

Access to SIM cards

Although refugees in Rwanda are legally able to access SIM cards by utilising UNHCR ID Cards, or refugee IDs issued by Rwandan Authorities, 'No registration/ID documents to buy a SIM card' was highlighted as a barrier to phone ownership by 7% of refugees compared to only 1% of the host community. This may indicate that the process of acquiring a SIM continues to present some barriers to mobile ownership and use for refugees in Rwanda.

Digital Work

Rwanda's progressive legal framework grants refugees the right to work and freedom of movement. This combined with the government's digital transformation agenda creates a favourable environment for digital livelihoods, which offers income-generating opportunities unconstrained by physical location or formal employment barriers.

UNHCR defines digital work as any income-generating activity in the digital economy, encompassing the full spectrum from traditional full-time employment conducted remotely to freelancing, platform-based gig work, digital entrepreneurship, e-commerce, and remote professional services.

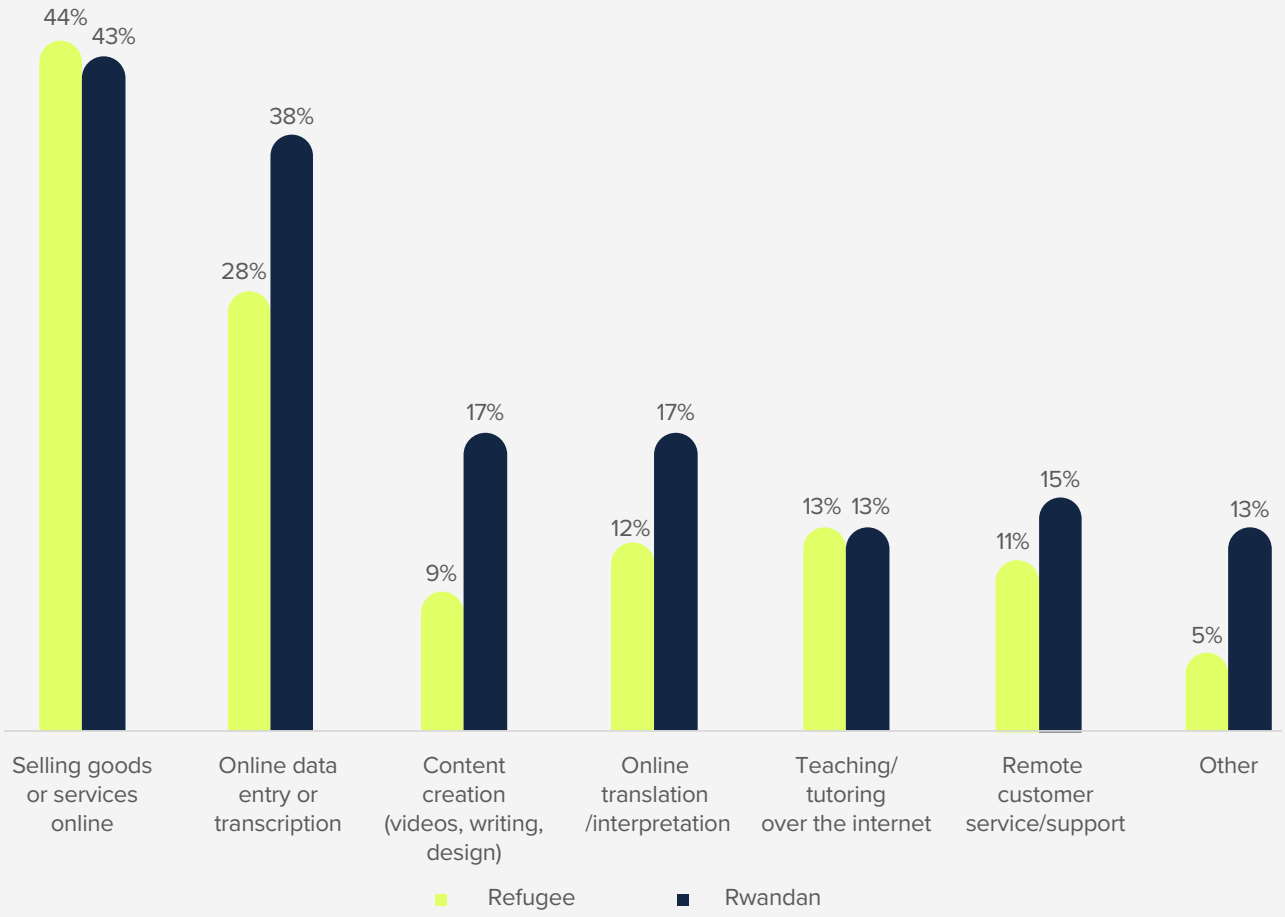
> ***"My motivation was survival and dignity. I wanted a skill that is not limited by my refugee status or physical location."*** — Digital worker, Kigali

Over two thirds (71%) of survey respondents have heard of digital work, but awareness does not yet translate into understanding, only 39% feel they know what it actually involves, and 29% have never encountered the concept at all.

Refugees are notably more aware of digital work than host community members. This likely reflects both the greater promotion of digital work within camp settings and the comparatively wider access to formal employment that host community members may have, reducing the impetus to explore alternative income streams.

Almost one in five of those surveyed have done paid digital work in the past year, a significant finding that demonstrates real demand and capability in refugee hosting areas to participate in the digital economy. Overall, 19% of FGD participants have engaged in digital work in the past year, with refugees (20%) participating at a higher rate than host community members (12%). Selling goods or services online (44%) and data entry or transcription (29%) are the most common activities types of digital work undertaken (**Figure 4**).

Figure 4: **Types of digital work undertaken**



What kind of paid work have you done online? Please indicate all that apply. (n=372, all respondents who participated in digital work in the past year)

Participation in digital work varies across key demographic groups. Men are more likely to have done digital work than women across both refugee (24% of men compared to 17% of women) and host communities (16% of men compared to 9% of women). Unsurprisingly, younger respondents participate at substantially higher rates than those over 50. Location also shapes participation considerably. Kigeme, the camp with the strongest connectivity profile, records the highest participation rates (32% of refugees, 30% of host community).

Among those who have not yet done digital work, the three most commonly cited barriers are: lack of appropriate skills (54%), lack of access to a suitable device such as a laptop or tablet (52%), and not knowing how to find opportunities (37%). Fear of scams, particularly in Mahama, also raises the threshold of confidence needed before people are willing to try.

> ***"Even those who have some skills for online work have no equipment such as smartphones or computers to perform those tasks."*** — Non-digital worker, Mahama

Conclusion and Recommendations

Coverage: While Rwanda enjoys strong national coverage, connectivity performance within refugee camps falls below the national average and gaps remain in several locations.

- Plans for infrastructure installation and upgrade should be prioritized in the camps with the weakest current performance. Based on the findings of this assessment, Mahama, Mugombwa, and Nyabiheke should be the first priorities, given their below national average download speeds.
- Where full infrastructure upgrades are not immediately feasible, deploying Wi-Fi access networks in and around refugee-hosting areas could extend connectivity from locations with stronger signal (e.g., schools) to nearby underserved residential areas.

Device and Airtime Affordability: Cost is the single greatest barrier to phone ownership and internet use, and it weighs disproportionately on refugees.

- Collaboration with mobile network operators and device manufacturers to develop low-cost smartphone options and airtime bundles tailored to the financial realities of refugees and host communities.
- Financial inclusion stakeholders, including government, development actors, and the private sector, should explore instalment-based or micro-financing options for device acquisition, lowering the upfront cost burden on vulnerable households.
- Zero-rating or discounting data access for key services should be explored as a means of reducing the ongoing cost of connectivity for those least able to afford it.

Digital Divides: Women, older people, and people with disabilities are consistently less connected across every dimension of digital access and use.

- Targeted digital inclusion interventions, developed in collaboration with the private sector, government, and community organizations, should explicitly address the needs of women, people with disabilities, and older populations. Interventions should be tailored to the specific barriers each group faces rather than applying a one-size-fits-all approach.
- Outreach and support should be delivered in accessible and safe settings that reduce social and cultural barriers to engagement. Training environments and workspaces should be designed to be women-friendly, with consideration for safe space standards, female facilitators, and flexible scheduling that accounts for household responsibilities. For women in particular, the environment in which support is delivered is as important as the support itself.
- Digital literacy and skills programs should include dedicated content for older adults, women, and other underconfident users, accounting for varying skill levels and the distinct digital challenges and risks each group faces.

Digital Livelihoods: Awareness of digital work is high but significant barriers prevent participation from reaching scale, particularly outside of Kigali.

- Investment in market-aligned digital skills training should move beyond foundational smartphone literacy to sector-specific skills such as content creation, data work, and software development, with English language support embedded throughout.
- Structured linkages to work opportunities should be developed through engagement with employers, freelancing platforms, and intermediaries, alongside dedicated support for new entrants to build portfolios and client relationships.
- Digital safety and fraud awareness should be integrated into all skills programming, and peer networks of established digital workers should be supported as a trusted source of guidance for those taking their first steps into the digital economy.
- As resources allow, communal digital workspaces should be established or expanded in refugee-hosting areas, providing not only connectivity and devices but tailored support to help people use them safely, confidently, and productively.

Introduction

Rwanda. Refugee businesses in Kigeme refugee camp © UNHCR/Lilly Carlisle

Rwanda is a small, densely populated East African nation of 14 million people modernizing its economy through sustainable tourism, mining, and digital and knowledge-based services, with national policies increasingly focused on digital inclusion and service delivery.[10]

The country is also host to more than 137,000 refugees and asylum seekers, many of whom have been in the country for decades. The Government of Rwanda (GoR) has introduced policies aimed at fostering the integration and self-reliance of refugee communities, and there is growing interest in the role that digital inclusion and digital livelihoods can play in advancing these objectives as well as the gaps that must be addressed to realize this potential.

This report presents the findings of three assessments comprising a mobile network coverage mapping, a connectivity needs and usage survey and focus group discussions on digital work and livelihoods, conducted across Kigali and refugee camps and host communities in Rwanda. Together, these methods aim to strengthen the evidence base on the connectivity landscape to inform more effective policy and programming for refugees and their host communities.

10 Republic of Rwanda Vision 2050 Abridged Version

Refugees in Rwanda

As a signatory to the 1951 Refugee Convention and the Global Compact on Refugees (**Box 1**), and as a member of the East African Community (EAC), Rwanda has established itself as a significant host country for refugees and forcibly displaced persons in recent decades. As of January 2026,[11] Rwanda hosts more than 137,000 refugees and asylum seekers, with the majority coming from the Democratic Republic of Congo (DRC) (60%) and Burundi (40%) and small numbers from Eritrea, Somalia, Sudan and South Sudan. Approximately 91% of refugees reside in five camps: Kiziba, Nyabiheke, Kigeme, Mugombwa, and Mahama.

Rwanda's legal and policy framework affords refugees a comprehensive set of rights, including access to civil registration, documentation, and essential services such as healthcare, education, and social protection.[12] Refugees are further entitled to work, own property, and enter into contracts,[13] and are explicitly recognised within Rwanda's National Financial Inclusion Strategy as a priority population for financial inclusion.[14] In practice, however, many refugees continue to struggle to access decent work, education, and financial opportunities, barriers that make meaningful integration into Rwanda's society difficult to achieve.[15]

In response to these challenges, the GoR has introduced a range of policies and strategies to strengthen refugee economic inclusion and self-reliance. These include the joint Economic Inclusion Strategy,[16] which seeks to expand refugees' economic opportunities and food security, and the Refugee Sustainable Graduation Strategy (**Box 2**), which promotes access to formal livelihoods and employment with a view to transition camp-based refugees out of humanitarian assistance. [17]

11 https://data.unhcr.org/en/documents/details/121038
12 https://rimap.unhcr.org/countries/rwanda
13 Ibid.
14 https://www.bnr.rw/documents/National_Financial_Inclusion_Roadmap_2026-2030_aX40crJ.pdf
15 Ibid
16 https://rimap.unhcr.org/countries/rwanda
17 https://www.minema.gov.rw/news-detail/rwanda-showcases-leadership-and-innovation-at-the-2025-global-refugee-forum

Box 1 **Global Refugee Forum – Government of Rwanda on Sustainable Human Settlements**

The Global Refugee Forum is a gathering of states and stakeholders every four years that serves as the primary mechanism for implementing the Global Compact on Refugees through concrete pledges and progress reviews. Through participation in the Global Refugee Forum in recent years, the Government of Rwanda has signalled its intention to implement policies and approaches which move beyond traditional camps toward integrated, development-oriented settlements for refugees.[18] [19]

Box 2 **Rwanda's Refugee Sustainable Graduation Strategy**

Rwanda's Ministry in Charge of Emergency Management (MINEMA), in partnership with UNHCR and a range of development, humanitarian, and private sector actors, is advancing the Refugee Sustainable Graduation Strategy with the aim of transitioning 50% of refugee households from humanitarian assistance to self-reliance by 2030.[20] The strategy builds on the National Strategy for Sustainable Graduation,[21] launched in 2022, which was originally designed to support below-the-poverty-line households in graduating from extreme poverty to sustainable and resilient livelihoods without reliance on social protection. Subsequent efforts have extended this framework to refugees living in Rwanda, with the strategy anchored in livelihoods, skills development and integration into national systems and programs.

18 https://www.minema.gov.rw/news-detail/rwanda-showcases-leadership-and-innovation-at-the-2025-global

19 https://www.rwandainswitzerland.gov.rw/actualites/info-details/rwanda-highlights-inclusive-refugee-policy-and-national-resilience-at-unhcr-excom

20 https://www.minema.gov.rw/news-detail/rwanda-showcases-leadership-and-innovation-at-the-2025-global-refugee-forum

21 https://www.minaloc.gov.rw/fileadmin/user_upload/Minaloc/Publications/Policies/Social_Protection/National_Strategy_for_Sustainable_Graduation.pdf

Digital Ecosystem in Rwanda

Over the past decade, Rwanda has made significant investments in its information and communication technology (ICT) sector, laying the foundations for a knowledge-based, digitally driven economy.[22] Rwanda's Vision 2050 and National Strategy for Transformation identify ICT as a key engine for cross-sectoral growth, with the country targeting upper middle-income status by 2035 and high-income status by 2050.[23] The 2024-2029 ICT Sector Strategic Plan advances this agenda by accelerating digital transformation, promoting digital inclusion, and enhancing digital service delivery.[24] Accompanying these policy ambitions and investments has been a concerted effort to grow a flourishing innovation, start-up and entrepreneurial ecosystem powered by expanded connectivity and partnerships such as Kigali's Innovation City, which aims to position Rwanda as an emerging tech-hub.[25]

The progress to-date, and ambitions of tomorrow, rely on a strong basis of fibre-optic and broadband network coverage that span over 21,847 kilometres and support an estimated 98% population coverage of 4G.[26] The market is currently dominated by two mobile network operators (MNOs), Airtel Rwanda and MTN Rwanda. MTN launched the first 5G network in the country in June 2025.[27] Nation-wide, mobile phone penetration is high,[28] with a growing number of Rwandans accessing the internet through smartphones.[29]

While Rwanda's expanding digital infrastructure and growing innovation ecosystem provide a strong foundation for digital inclusion and livelihoods opportunities for refugees and host communities, this report reveals in the following sections that gaps in service, access, usage, and skills remain. Addressing these gaps in a sustained and coordinated manner can meaningfully advance the digital inclusion ambitions and policy aims of the GoR.

22 https://newminict.prod.risa.rw/fileadmin/user_upload/minict_user_upload/Documents/Strategies/The_Rwanda_National_Digital_Inclusion_Strategy.pdf p 8
23 https://www.minecofin.gov.rw/fileadmin/user_upload/Minecofin/Publications/REPORTS/National_Development_Planning_and_Research/Vision_2050/English-Vision_2050_Abridged_version_WEB_Final.pdf
24 https://www.minecofin.gov.rw/indexphp?eID=dumpFile&t=f&f=113422&token=393aadd8a3d29f4a7e58208ee524359716daba6d#:~:text=Accelerating%20Digital%20Transformation:%20The%20ICT,and%20benefit%20from%20digital%20technologies. pg. 3
25 https://www.minict.gov.rw/news-detail/the-government-of-rwanda-africa50-and-badea-break-ground-on-the-construction-of-kigali-innovation-city-kic
26 https://www.minecofin.gov.rw/index.php?eID=dumpFile&t=f&f=113422&token=393aadd8a3d29f4a7e58208ee524359716daba6d pg. 8
27 https://www.mtn.co.rw/newsabout/mtn-rwanda-powers-the-nations-digital-future-with-the-launch-of-new-5g-sites-paving-the-way-for-a-smarter-more-connected-rwanda
28 2025 – GSMA Mobile Connectivity Index (accessed January 2026)
29 https://statistics.gov.rw/data-sources/censuses/Population-and-Housing-Census/fifth-population-and-housing-census-2022

Methodology

A full methodology note is available in Annex A.

Objectives

The assessment seeks to identify barriers and opportunities to advance digital inclusion objectives for Rwanda. It aims to understand the digital realities of refugees and host communities across three areas:

- Mobile network coverage availability and quality in refugee-hosting regions
- Connectivity needs, usage patterns, and preferences
- Barriers to and opportunities for refugee participation in the digital economy

Methods

This assessment comprises of three data collection exercises:

1. **Mobile coverage mapping exercise** designed and deployed by UNHCR and Ericsson Response to understand signal strength and quality in all five camps (i.e., Mahama, Nyabiheke, Kigeme, Mugombwa, and Kiziba). Data was collected between October 24-30, 2025. In parallel, the ITU ran a nationwide crowd-sourced Speedchecker measurement campaign between October 10-31 2025, to give a national baseline against which to benchmark the coverage mapping results received from refugee camps.

2. **Connectivity needs and usage survey** adapted from the GSMA Connectivity, Needs and Usage Assessment (CoNUA) toolkit and tailored to the specific refugee context in Rwanda. The tool was deployed in Rwanda by UNHCR in partnership with ALIGHT Rwanda, collecting quantitative data from refugee and host communities at the individual level across all five camps and urban Kigali. The data was collected between November 19 – December 20, 2025. Additional data cleaning, analysis and inputs were completed by KPHR Inc.

3. **Six focus group discussions** (FDGs) conducted by ALIGHT Rwanda in 3 locations (Kigali, Mahama, Nyabiheke) of refugee and host community digital workers and non-digital workers. These were interpreted to identify common themes and patterns and explore differences by location. The FGDs were hosted between November 19 – December 20, 2025.

Demographics for Connectivity Needs and Usage Survey and Focus Group Discussions

The survey was carried out in 6 locations, of which each location had two categories of respondents, refugee and host community (**Figure 5**). For a detailed breakdown of respondent demographics see Annex B.

Note that the connectivity needs and usage survey sample was designed to reflect the demographic profile of the refugee population in Rwanda, with location, gender, and age distributions closely matched to official population data across the six surveyed sites. While the sample is representative at a national level for the refugee population, ensuring representative samples in every individual location would require significant additional capacity. As such, disaggregated location data is presented as some interesting differences by location found, which could warrant further exploration with other evidence, but caution is advised against using this data alone for specific location-based recommendations (particularly related to host communities).

Limitations of the data collection exercises are outlined in **Box 3**.

Figure 5: **Demographics Breakdown for Survey and Focus Group Discussions**

Location	Refugee survey sample size		Host survey sample size		Focus Group Discussions
Kigali	152	9%	38	10%	2
Kigeme	185	11%	43	11%	0
Kiziba	171	11%	46	12%	0
Mahama	799	50%	176	47%	2
Mugombwa	150	9%	35	9%	0
Nyabiheke	154	10%	39	10%	2
Total sample	**1611**	81%	**377**	19%	

Box 3 Summary of Limitations

Mobile coverage mapping: Connectivity mapping collects a snapshot in time, reflecting network performance on a specific day and is influenced by factors such as user volume, user activity, and temporary site outages. The data also reflects outdoor coverage conditions, meaning indoor signal strength may be lower due to building materials absorbing radio frequency energy. For these reasons, results should be interpreted with caution, as actual connectivity experiences may vary by location, time, and environment.

Connectivity needs and usage survey: Issues with the skip logic used during data collection resulted in participants being asked irrelevant questions and providing contradictory answers. To correct this, questions were filtered to relevant participants only during the analysis. Whilst the methodology aimed to collect responses from a representative sample of refugees by location and demographic, this sometimes resulted in small sample sizes for specific user groups. Data should therefore be interpreted as an indication of likely trends.

Focus group discussions: Participants were purposively selected and may reflect those already engaged with ALIGHT or more motivated to participate, introducing potential selection bias. Differences across locations may also reflect local contextual factors not fully captured in the analysis. As such, the findings are indicative rather than generalizable.
For a full overview of limitations, see Annex C.

ALIGHT Coding School - Mahama Camp

Findings

The following section combines key findings from the three data collection exercises: mobile network coverage, connectivity needs and usage survey, and focus group discussions on digital work.

Mobile Network Coverage and Quality

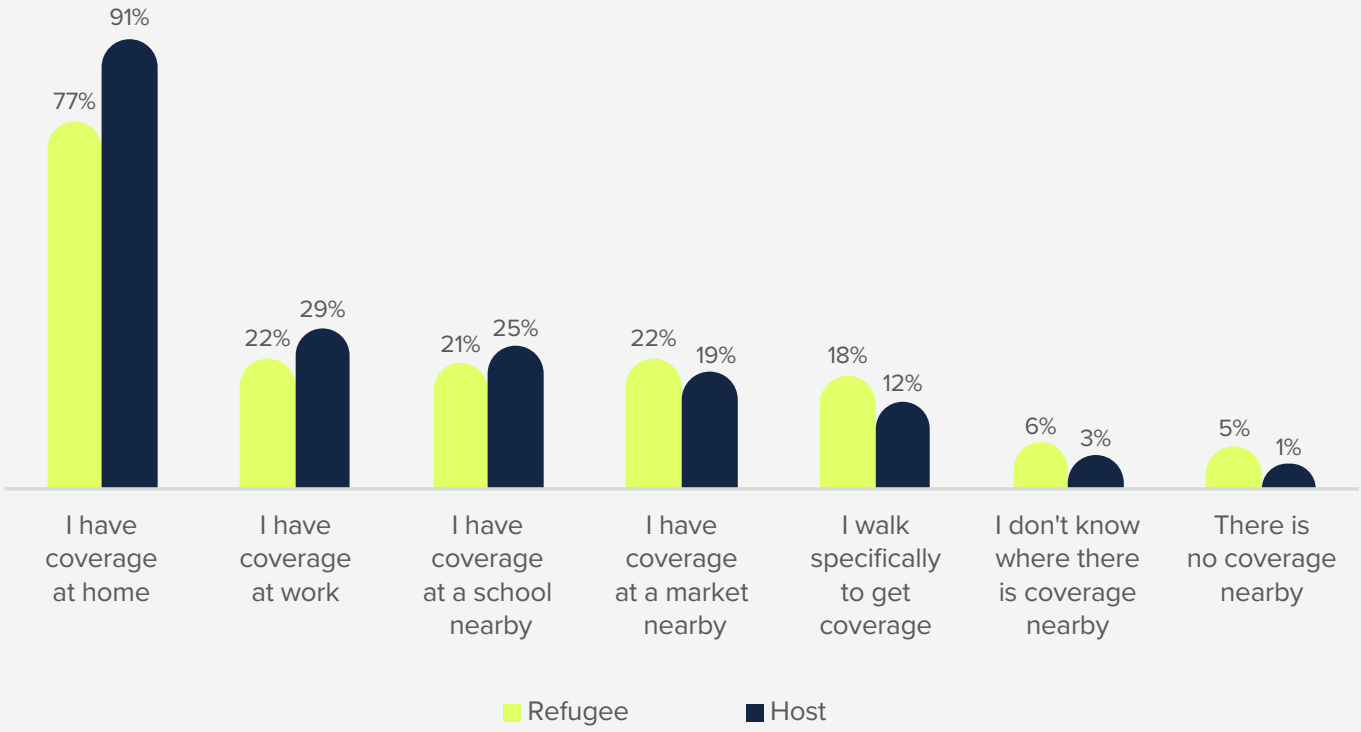
MTN and Airtel Rwanda are the market leaders in the country, and collectively they have an estimated 98% population coverage with 4G networks.[30] Data from the connectivity needs and usage survey shows that while 4G is the most commonly used network among respondents (65% overall; 66% refugees, 60% Rwandans), a significant share rely on older network generations, with 33% using 2G and 37% using 3G. A very small minority make use of 5G. These patterns may be influenced by a range of factors including the availability and quality of coverage across different locations as illustrated in more detail below.

The mobile coverage mapping exercise found that 3G and 4G signal availability across Rwanda's five refugee camps varied considerably, with Kigeme benefiting from strong coverage due to the close proximity of radio towers and Kiziba maintaining reasonable outdoor coverage mainly along its main ridgetop given the area has a clear line-of-sight to mobile towers close by that allows signal to travel with little obstruction. IIn contrast, Mugombwa, Nyabiheke, and parts of Mahama all experience meaningful all experience meaningful coverage gaps driven by terrain, tower distance, and radio antenna orientation. As such, portions of residential areas in these camps are receiving weak or inconsistent signal.

Beyond the mobile coverage mapping exercise, the connectivity needs and usage survey reveals disparities between refugee and host communities (**Figure 6**). Refugees were less likely to report having access to coverage at home compared to host community respondents (91% of host communities to just 77% of refugee respondents) with refugees being more likely to report needing to walk to access connectivity (18% compared to 12% of host community respondents) or live in an area with no nearby coverage (5% to 1%). The reasons behind this gap warrant further investigation, but the data suggests that refugees may be more likely to reside in areas where coverage is limited or harder to reach.

30 https://www.minecofin.gov.rw/index.php?eID=dumpFile&t=f&f=113422&token=393aadd8a3d29f4a7e58208ee524359716daba6d (pg. 8)

Figure 6: **Network coverage access, by status**



Do you have network coverage to make calls and send text messages (SMS) with your mobile phone at home or anywhere else? Of all respondents that answered the question; excludes 323 who said 'Not applicable'

Beyond coverage availability, the quality of that connection tells an equally important story. Coverage does not necessarily mean having a good connection. For example, a phone may show a 4G signal, but in practice the internet can still be slow, unreliable, or struggle to load basic content. To address this gap, a mobile coverage mapping exercise was conducted to measure not only how strong but also how reliable mobile connections are in practice.

The mapping exercise revealed that connectivity performance within refugee camps falls below the national average. Cellular connectivity for the whole of Rwanda was an average download speed of 27.3 Mbps. The assessment of 3G and 4G networks in all five camps found that the average connectivity for all five refugee camps is lower than the average for the whole of Rwanda (**Box 4**). The camps recorded an average download speed of 21.7 Mbps – around 80% of Rwanda's national average of 27.0 Mbps. Both mobile operators had a similar performance.

Box 4 **Download Speeds, Upload Speeds, and Latency**

Mbps, or megabits per second, is the standard unit for measuring internet speed; the higher the number, the faster the connection.

Download speed (Mbps) refers to how quickly a device receives data, such as loading a webpage or streaming a video. Upload speed (Mbps) refers to how quickly a device sends data, such as making a video call or sharing a file. Latency (ms) measures the delay in a connection; the lower the number, the more responsive the experience.

Together, these three metrics provide a comprehensive picture of real-world network quality beyond simple coverage statistics.

Network performance also varied significantly across each camp (**Figure 7**). Kigeme had better performance than the national average (download speed of 27.3 Mbps) while Mahama, Mugombwa and Nyabiheke refugee camps were below the national average.

Figure 7: **Average 3G and 4G performance, by camp**

Location	Download speed (Mbps)	Upload speed (Mbps)	Latency
Kigeme	33.6	16.3	54.3
Kiziba	26.3	7.8	55.5
Mahama	11.2	6.9	51.4
Mugombwa	12.4	6.1	59.9
Nyabiheke	17.4	6.0	51.7
Average for Refugee Camps	**21.7**	**8.6**	**53.6**
Rwanda	**27.0**	**9.0**	**43.7**

Through both the mobile mapping exercise and survey responses, camps fall into three tiers: Kigeme performing well on both coverage and quality, Kiziba adequate but uneven, and Mahama, Mugombwa, and Nyabiheke all materially underserved

- **Kigeme** has the strongest performance of all camps. Signal availability from the operators is high, driven by radio towers just 1 km away from the camp. This is reflected in survey data, where 96% of residents report having mobile coverage at home, the highest of any camp. The only meaningful gap is on the western hillside shielded by the central ridge.

- **Kiziba** has adequate but uneven signal availability. Outdoor coverage is strong along the main ridgetop but drops off in downslope areas and densely constructed neighborhoods. Survey data reflects this unevenness, while 71% of refugee respondents report home coverage, this drops to just 62% among the host community, one of the lower figures across all groups.

- **Mahama** has strong signal availability across most residential areas of the camp due to a tower placed in the middle of the camp. However, the south-eastern corner is underserved due to terrain despite the tower being less than 2km away, suggesting that target adjustments to the tower may help expand coverage. Network performance is also a concern, with average download speeds of just 11.2 Mbps, the lowest of any camp, likely reflecting the strain of serving Rwanda's largest refugee population of almost 70,000 residents. Adjustments to radio orientation or network capacity could help ameliorate both gaps.

- **Mugombwa** has weak 3G and 4G signal availability across most of the camp, with valley topography blocking line-of-sight to the nearest 3G towers for many of residents. Survey data also shows that this is most acute for the host community, where only 53% report mobile coverage at home and just 20% report home internet coverage, the lowest of any group across all camps. This may also explain why 2G remains the most used network among host community residents.

- **Nyabiheke** has the weakest 3G and 4G signal availability of all five camps. Towers located nearly 3 km away on both sides of the camp, combined with a central ridge that fragments signal reach, leaving residential areas in the central, eastern, and north-western corner of the camp with poor coverage. Survey data confirms this reality as just 56% of refugee respondents report mobile coverage at home, the lowest of any camp, and only 49% report home internet coverage. This may also explain the predominant reliance on 3G across the camp.

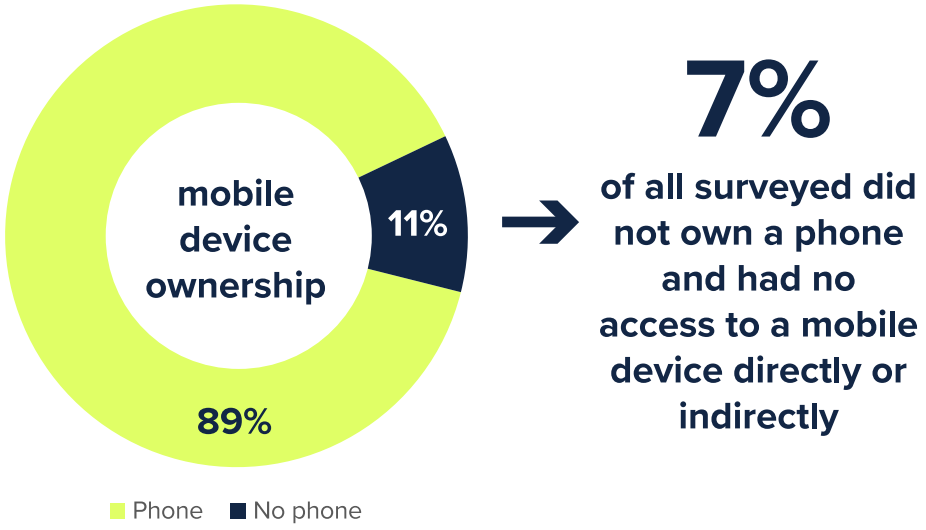
For a more detailed breakdown of network coverage by camp, see Annex D.

Phone Access and Ownership

Access to a device is a fundamental enabler of digital connectivity. Without one, individuals cannot access mobile networks, use internet services, or participate in the digital economy regardless of what infrastructure exists around them. This section draws on the connectivity needs and usage survey to examine patterns of phone ownership, SIM access, and frequency of use, with particular attention to disparities across population groups and demographics.

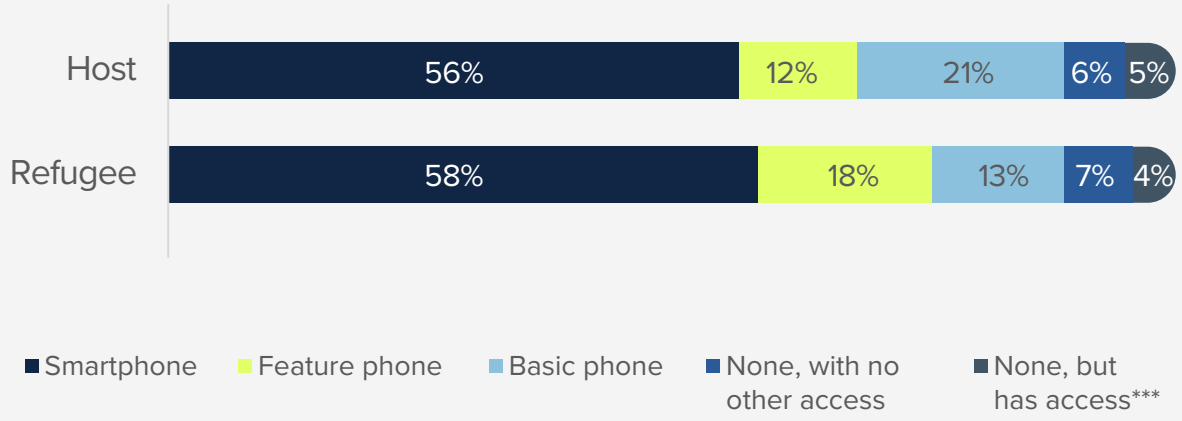
1. Phone Ownership

Ownership rates were found to be high among both refugees and host communities (**Figure 8**). 89% of both refugee and host community respondents reported owning a phone of any type. Only 7% of total respondents had no phone and no access to a device through friends, family or community centre. No significant difference in access to a phone was seen between refugees and host communities.



Smartphones are prevalent, with 58% of all respondents owning a smartphone. As with overall ownership rates, smartphone ownership was similar between refugee and host communities. Refugees have slightly higher levels of ownership to feature phones over basic phones, compared to host communities. Percentages of those not owning a phone were similar across both communities.

Figure 8: **Individual phone ownership, by status**



What kind of phone(s) do you personally own?

* May also have a basic phone.

** May also have basic and/or feature phones.

*** Has access to a phone via friends or family, or at a community centre.

Digital Divides

While ownership rates between refugees and host communities are broadly comparable, a closer look at the data reveals disparities across gender, age, disability status, and nationality. Women have less access to smartphones (55% of women own a smartphone compared to 61% of men), with women more likely to own basic phones (17% of women own a basic phone only compared to 12% of men). Age, disability, and literacy compound this further, with ownership of any phone type, and smartphones in particular, dropping significantly among those aged 50 and above, people with disabilities, and those who are illiterate. Refugees from DRC are more likely to have a smartphone than those from Burundi (65% of refugees from DRC had a smartphone compared to just 46% from Burundi), though ownership levels of a phone of any type overall was broadly similar.

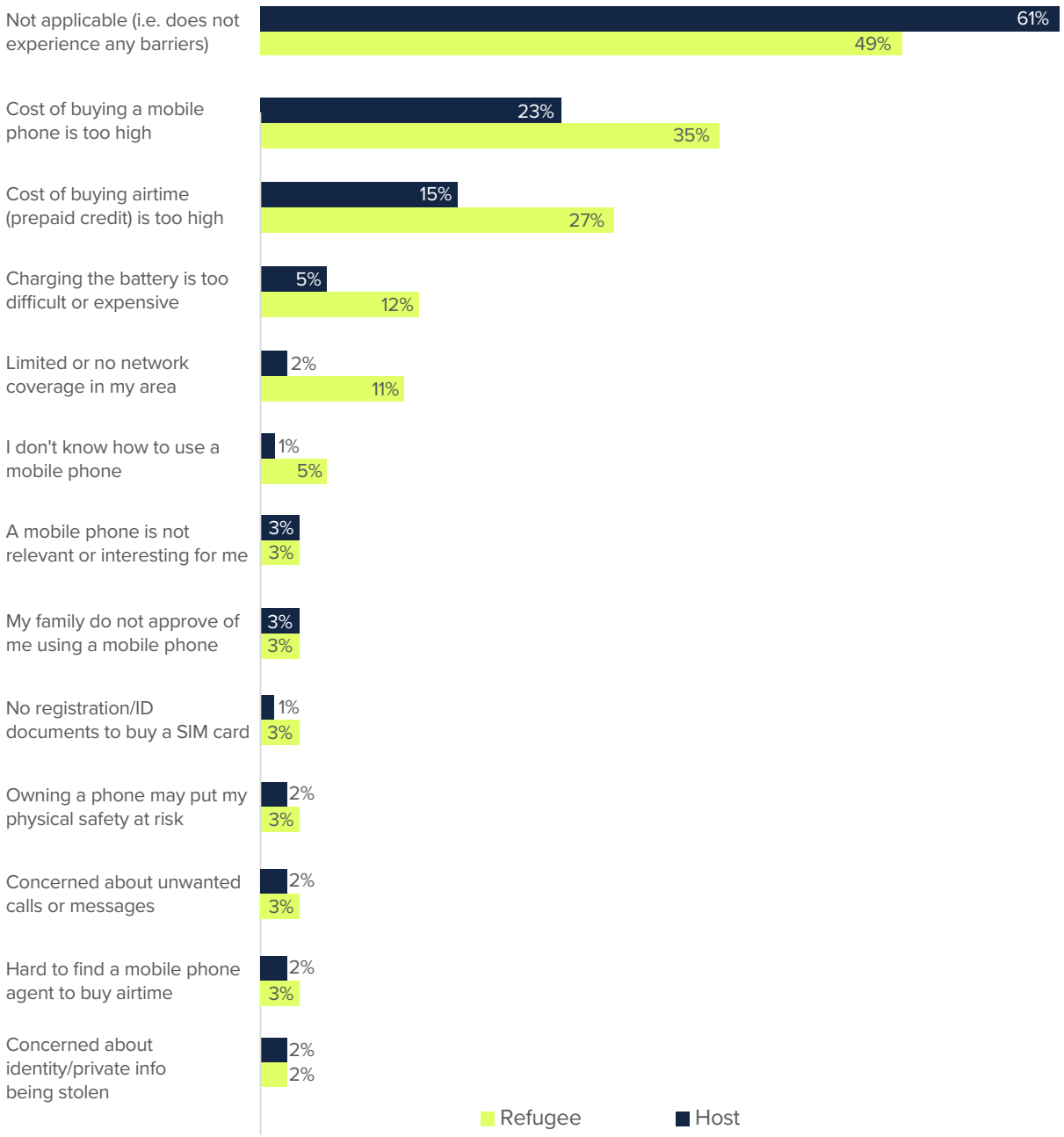
For a detailed breakdown of phone and device ownership by camp, see Annex D.

2. Barriers to Phone Ownership

All respondents were asked what prevents them from owning a mobile phone (**Figure 9**). Airtime cost, device cost, and charging issues were the top three barriers cited among both the refugee and host communities.

Note on figures: All survey respondents were asked this question, including those that had answered that they owned a mobile phone. Whilst some of these individuals selected 'Not applicable' others selected one or more other barriers, possibly indicating barriers that they had to overcome to buy a phone, or that they perceived as barriers to phone ownership for others. Data should therefore be interpreted as an indication of likely trends in the different experiences and perceptions between refugee and host communities.

Figure 9: **Barriers preventing phone ownership, by status**



Which of the following reasons prevent you from owning a mobile phone? (n=1988, all respondents)

3 Top Barriers To Phone Ownership

Airtime costs

Device costs

Charging costs and convenience

Digital Divides

Barriers to phone ownership vary across different populations and their subgroups. Women are slightly more likely to report facing barriers than men. In particular, the cost of purchasing a phone was cited more frequently as a barrier by women (36%) than men (30%). Age also plays a significant factor, with older respondents (50+) most likely to report barriers of any kind. The cost of a phone weighs more heavily on this group (42%) than on those aged 25 to 49 (28%) or 18 to 24 (36%), and unfamiliarity with how to use a phone is almost exclusively among older respondents, reported by 16% of those over 50 compared to just 1 to 2% of younger respondents.

While limited or no network coverage was not among the most frequently cited barriers overall, refugees were significantly more likely to raise it than host community members (11% compared to just 2%). This may reflect the uneven coverage landscape within camps as documented in the *Mobile Network Coverage and Quality* section earlier in the report.

This is particularly pronounced in Nyabiheke and Mahama, where 17% and 16% of respondents respectively identified coverage gaps as a barrier, compared to less than 6% in all other locations. This aligns closely with the mobile network mapping findings, which identified both camps among the most underserved in terms of signal availability and network performance, with Nyabiheke recording the lowest home mobile coverage of any camp and Mahama the lowest download speeds.

3. SIM Access

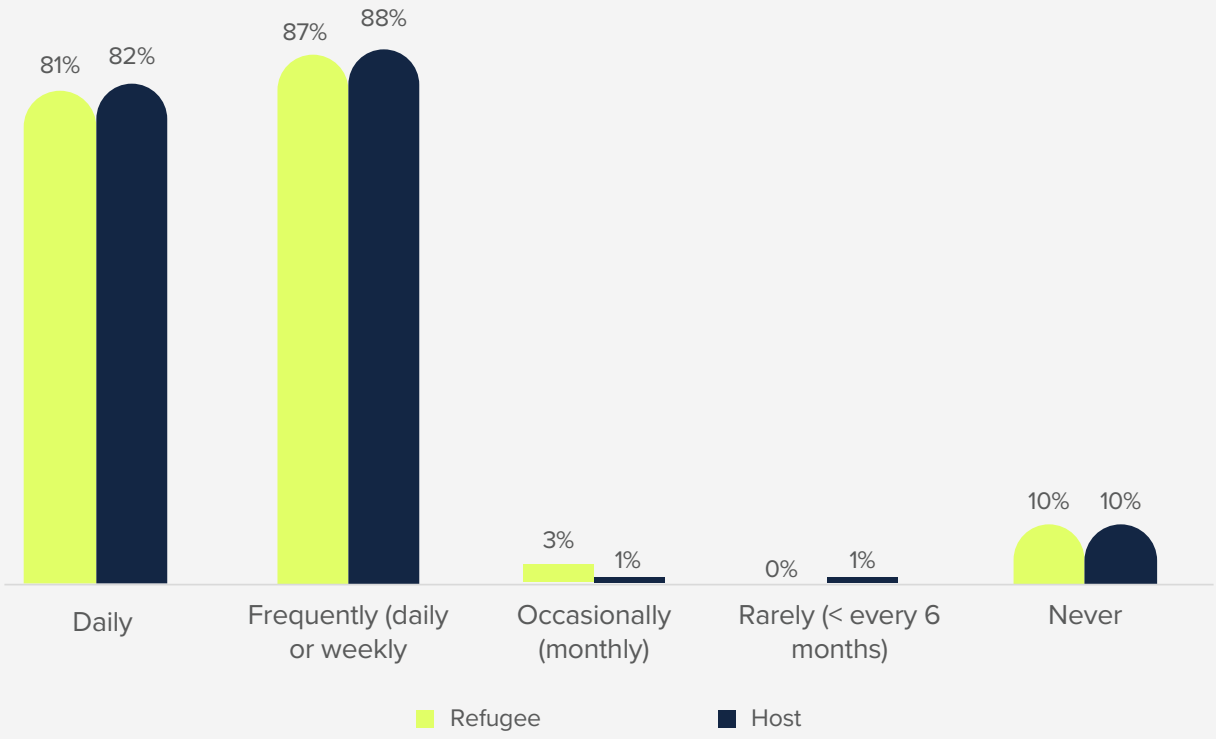
Refugees in Rwanda are legally able to access SIM cards by utilising UNHCR ID Cards, or refugee IDs issued by Rwandan Authorities. While this reduces potential lack of access to SIM cards as a barrier for displaced populations, 'No registration/ID documents to buy a SIM card' was highlighted as a barrier to phone ownership by 7% of refugees compared to only 1% of the host community. It was the sixth most frequently cited barrier for refugees, whilst it was at the bottom of the list (12th) for host communities.

This may suggest that while structural barriers to SIM access have been intentionally lowered for refugees in Rwanda through relevant policy change, friction continues to exist when compared to host community access. Though the precise reasons for this gap warrant further investigation, it is possible that contributing factors include refugees not having their valid ID Cards required for registration or lower levels of digital literacy leading to difficulties navigating and understanding SIM registration processes. Further intervention here could ultimately enhance mobile ownership of refugees, particularly those with additional access challenges.

4. Phone Use

With high mobile penetration rates in Rwanda, both refugee and host communities reported high use of mobile (87% reporting using a phone at least once a week), with only 10% of respondents saying that they never use a phone at all (**Figure 10**).

Figure 10: **Frequency in mobile phone usage, by status**



*Includes daily users (row above)
How often do you use a mobile phone, for any purpose, if at all? (n=1,984, all respondents excluding blanks)

There was no significant difference between the frequency of phone use between refugees and host communities, with 81% and 82% of refugees and host community (respectively) using a phone on a daily basis.

When it comes to topping up, mobile money and mobile agents are the two dominant methods, used by 73% and 72% of phone users respectively. However, preferences differ between communities. Host community respondents are more likely to use mobile money (80% compared to 71% of refugees), while refugee respondents are more commonly topping up through mobile agents (76% compared to 54% of host community members). Among refugees, men are more likely to use mobile money (76% men compared to 67% of women) but buy from mobile agents at similar rates (76% of women, 75% of men).

Digital Divides

Disaggregated mobile usage data reveals disparities across key subgroups. Men are slightly more likely than women to use a phone daily (84% compared to 79%), though this gap narrows at the weekly use level (88% of men and 86% of women). Age is a more pronounced differentiator. While 18-24 year olds and 25-49 year olds use a phone at similar frequencies, frequency of use is notably lower among older people. While 92% of adults under 49 use a phone at least weekly, this falls to just 66% among those over 50. 27% of those over 50 never use a phone at all.

5. Barriers to Phone Usage

In barriers to phone use, 11% of all respondents who owned a phone reported expensive charging as a barrier. Among phone-owners, this barrier was noted by 12% of phone owners from refugee communities and 4% from host communities. However, 98% of phone and/or internet users reported being able to charge their phone somewhere, with little difference by gender, age or citizen status. That said, there are significant differences in where different user groups charge their devices. 88% of Rwandans charge at home compared to 59% of refugees, and 66% of refugees use commercial charging points (compared to 27% Rwandans) indicating poorer electricity coverage in camps.

Overall, this suggests it may be the expense of the charging services at commercial points that represents the barrier, rather than lack of access to charging at all. This interpretation is consistent with insights shared during focus group discussions with community members.

Other barriers cited by respondents who owned a phone include the high cost of buying airtime (24%) and limited or no network coverage in their area (10%).

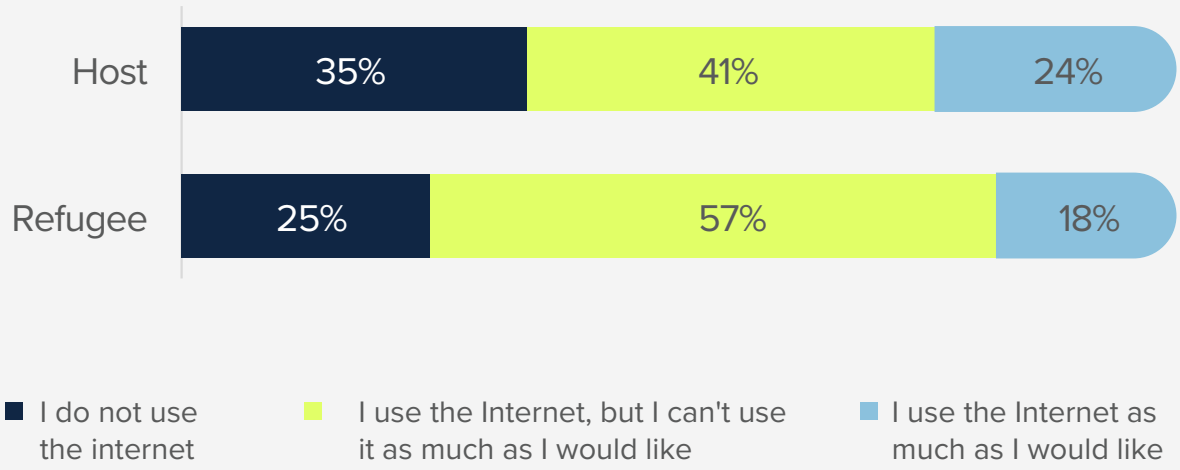
Use of Internet

Understanding whether people are getting online, how often, and what is stopping them from doing so is essential to building a complete picture of digital inclusion across refugee and host communities. Internet use reflects not just infrastructure availability, but also affordability, digital confidence, and more. This section draws on the connectivity needs and usage survey to examine awareness and use of the internet, access to Wi-Fi, and the barriers that prevent people from getting online as much as they would like.

1. Knowledge and Use of the Internet

Internet awareness is high across both communities, with 81% of total respondents having heard of the internet (**Figure 11**). However, awareness alone does not translate into meaningful use. The majority of refugees report using the internet less than they would like (57%), only 18% feel they can access it as much as they need to. In host communities, 24% of respondents use the internet as much as they would like, though a greater proportion report not using it at all (35%). These figures may suggest that while refugees are largely aware of the internet, they may be consistently constrained in their ability to use it fully.

Figure 11: **Internet usage, by status**



Which of the following statements best describe your current use of Internet (social media, apps, and websites like WhatsApp, Messenger, Facebook, etc)? (n=1,974, all respondents excluding blanks)

Wi-Fi access remains limited, with only 31% of respondents able to access it anywhere at all. Where it is available, it is most commonly found at schools (17%) and workplaces (11%), with just 10% reporting home access.

Digital Divides

Age and gender shape knowledge and use of the internet further. Of all respondents, men are slightly more likely to have heard of the internet than women (84% compared to 79%). The gap by age is considerably more pronounced. 87% of those under 50 have heard of the internet compared to just 53% of those over 50, reinforcing the pattern of the older population being less connected across multiple dimensions.

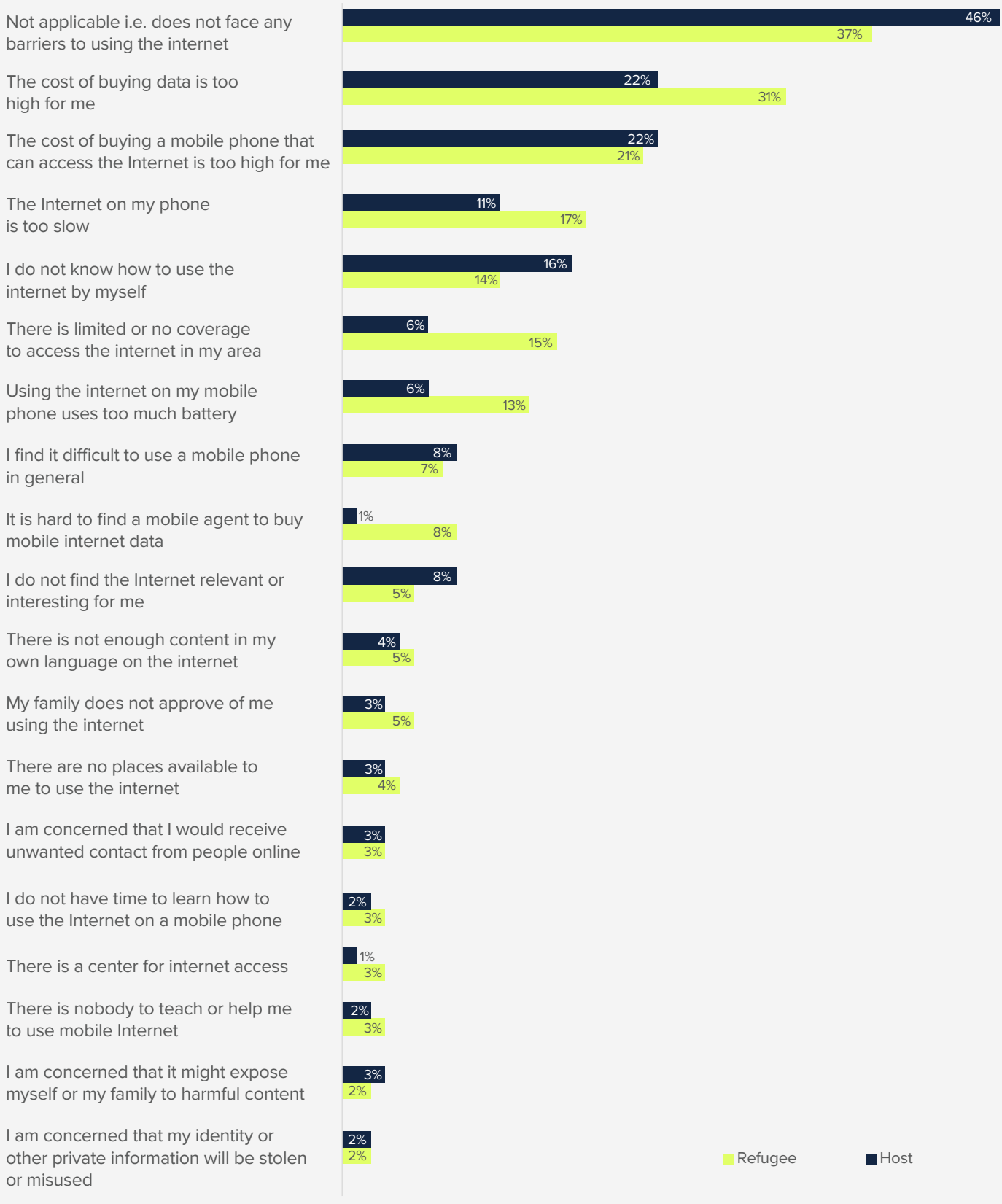
In terms of Wi-Fi access, men are slightly more likely than women to report Wi-Fi access (35% compared to 28%). This gap is most pronounced at the workplace, where male respondents are more likely to report accessing connectivity at work than women.

2. Barriers to Internet Use

In terms of barriers to internet use (**Figure 12**), cost is the defining barrier. The cost of mobile data is the most frequently cited constraint overall (29%), cited significantly more by refugees (31%) than host community members (22%), and the cost of purchasing an internet-enabled handset follows closely (21% across both groups). Slow internet speeds, skills, and limited coverage also feature prominently.

By contrast, barriers related to family disapproval, privacy concerns, and harmful content were rarely cited, each registering below 4% overall.

Figure 12: **Barriers preventing internet use, by status**



Which of the following reasons prevent you from using the Internet (social media, apps, and websites like WhatsApp, Messenger, Facebook, etc...)? (n=1,988, all respondents)

Digital Work

Rwanda's progressive legal framework grants refugees the right to work and freedom of movement, and the government's broader digital transformation agenda creates a genuinely favourable policy environment for digital livelihoods. Against this backdrop, digital work holds real promise, offering income-generating opportunities that are less constrained by physical location or formal employment barriers than traditional work.

UNHCR defines digital work as any income-generating activity in the digital economy, encompassing the full spectrum from traditional full-time employment conducted remotely to freelancing, platform-based gig work, digital entrepreneurship, e-commerce, and remote professional services. The defining characteristic is that the work is facilitated through digital tools and connectivity, enabling people to participate in economic opportunities regardless of their physical location.

Yet significant barriers stand between this potential and its realization. Limited access to devices, reliable connectivity, financial services, and the digital literacy needed to compete in local and global markets all prevent digital work from reaching meaningful scale among refugees and host communities alike. To understand these barriers and opportunities more fully, this section draws on both the connectivity usage and needs survey and supplementary focus group discussions held with refugees and host community members who are already working online or exploring how to enter the digital economy.

1. Understanding of Digital Work

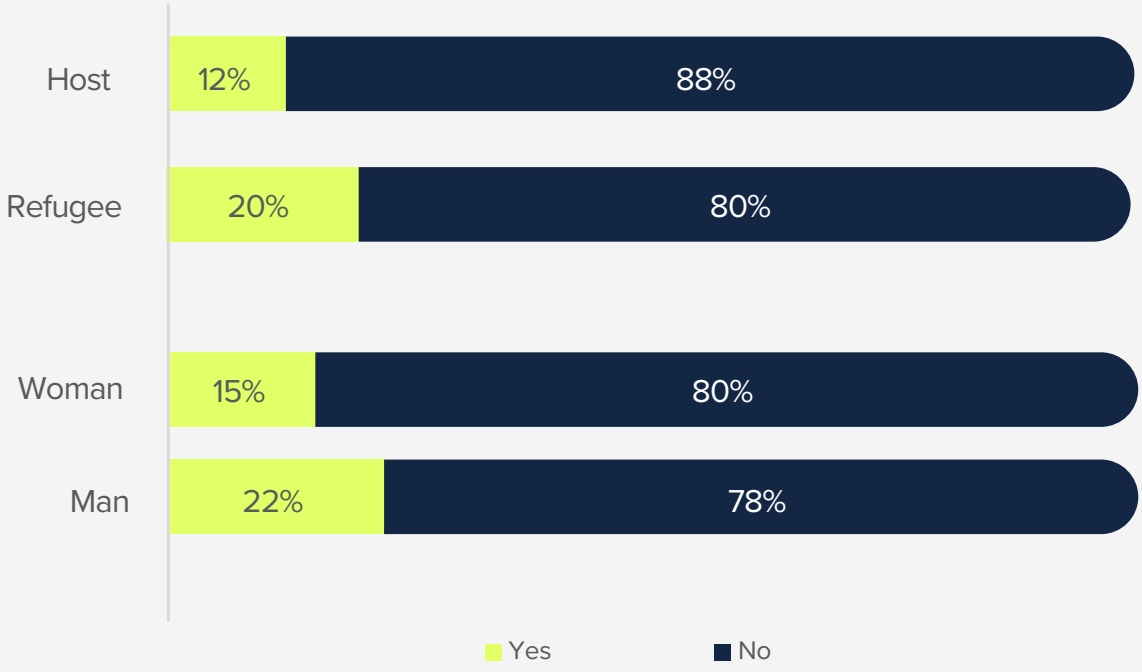
Over two thirds (71%) of respondents have heard of digital work, but awareness does not yet translate into understanding, only 39% feel they know what it actually involves, and 29% have never encountered the concept at all.

Refugees are notably more aware of digital work than host community members: 75% of refugees have heard of it compared to 53% of Rwandans, and 40% understand it well compared to 35%. This likely reflects both the greater promotion of digital work within camp settings and the comparatively wider access to formal employment that host community members may have, reducing the impetus to explore alternative income streams.

Awareness and understanding also vary across demographic groups. Men report a slightly stronger grasp of digital work than women (44% understand it well compared to 34%), and the gap widens considerably across age and literacy lines, older respondents (50+), people with disabilities, and those who cannot read or write all report notably lower awareness, reinforcing the pattern of compounding disadvantage seen elsewhere in this report.

2. Undertaking Digital Work

Figure 13: **Undertaking digital work**



During the past year, have you done paid work online (e.g. E-commerce, data tasks (entry/transcription) or content creation) for payment etc.)? (n=1,980, all respondents excluding blanks). For a more detailed breakdown, see Annex E.

Overall, almost a fifth (19%) of those surveyed have done paid digital work in the past year (**Figure 13**). A greater proportion of refugees (20%) have participated in digital work than the host community (12%).

For a more detailed breakdown of digital work engagement, see Annex E.

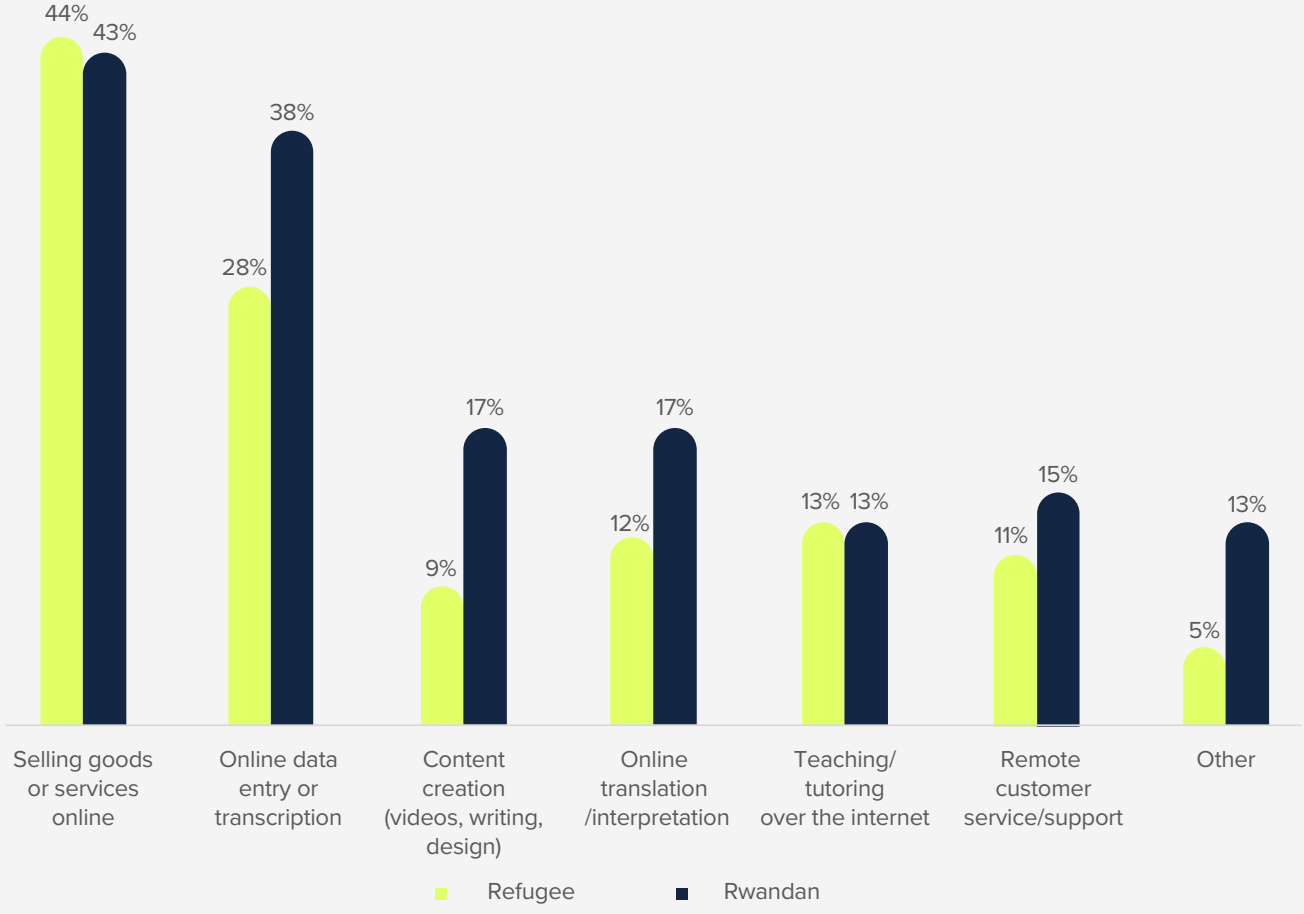
Digital Divides

Participation in digital work varies across key demographic groups. Men are more likely to have done digital work than women across both refugee (24% of men compared to 17% of women) and host communities (16% of men compared to 9% of women). Unsurprisingly, younger respondents participate at substantially higher rates than those over 50. While people with disabilities reported lower awareness and understanding of digital work, participation rates among those

who are aware are broadly comparable - 17% of people living with disabilities have done digital work compared to 20% of those without, suggesting that once aware, people with disabilities are broadly able to engage.

Location also shapes participation considerably. Kigeme stands out with the highest rates across both communities (32% of refugees, 30% of host), consistent with its stronger connectivity profile. The refugee-host gap is most pronounced in Kiziba and Mahama, where 23% and 19% of refugees respectively have participated compared to just 7% and 6% of host community members. Kigali reverses this trend - 37% of Rwandan nationals have participated compared to just 13% of urban refugees, though the sample size in Kigali is small and findings should be interpreted with caution. If indicative, this could suggest that camp-based promotion of digital work is reaching refugees more effectively than equivalent outreach in urban settings, where NGO support is more limited and informal networks harder to access, a gap that warrants further investigation.

Figure 14: **Types of digital work undertaken**



What kind of paid work have you done online? Please indicate all that apply. (n=372, all respondents who participated in digital work in the past year)

The types of digital work being undertaken reflect both the opportunities available and the skills and resources people have access to. Among those who have done paid digital work in the past year (**Figure 14**), selling goods or services online is the most common activity (44%), followed by online data entry and transcription (29%). There are no significant differences between refugees and host communities in the types of work undertaken, though important to note that the host community sample of digital workers is significantly smaller. A small number of respondents listed activities such as trading, agriculture, mobile money agency work, and phone charging under 'other', suggesting some may perceive adjacent economic activities as part of the digital economy.

Focus group discussions reveal a richer and more varied picture. In camps, workers described engaging in content creation, social media work, online sales, and coding, with one worker in Mahama also mentioning cryptocurrency and forex trading. In Kigali, the range and sophistication of work was notably higher, with workers describing web design, user-interface design, and front- and back-end software development.

How workers find clients varies as much as what they do. Many use freelancing platforms such as Upwork and Fiverr, or professional and social networks including LinkedIn and Facebook, while others rely on referrals and word of mouth, a reminder that trust and reputation remain as important in the digital economy as in any other sector.

Where people work is shaped largely by where they can get a reliable connection. Most workers work from home, but this is not always by choice. Workers in Nyabiheke described moving between libraries, internet cafes, and friends' houses depending on connectivity, while the contrast between the two Mahama workers below captures the range of circumstances that can sit behind the same label of 'digital worker':

> ***"I work from home or leave around the camp and host community to search for a good location depending on the content we are going to create."*** – Worker, Mahama

> ***"I work at Kabeza center in Mahama sector and I have an office, I use laptops, desktop, printers, and other many things which help me in my job and every month I receive the salary based on all services I provided to clients and my employer give me commission on every service I help the client to get."*** – Worker, Mahama

3. Phone and Internet Access for Digital Work

Access to appropriate devices and reliable connectivity emerges as a clear dividing line between those who do digital work and those who do not. Focus group discussions reveal that workers almost universally own smartphones and, in many cases, additional devices such as laptops, while non-workers are far more likely to rely on basic phones or have no device at all, a gap that directly shapes their ability to get online and engage with digital work opportunities.

For non-workers, device type largely determines internet behaviour: those with basic phones tend not to use the internet at all, while those with smartphones connect primarily through data bundles, with occasional access to Wi-Fi at schools or community centres. Workers, by contrast, use the internet more regularly and through a broader range of means - data bundles, Wi-Fi, and occasionally internet cafes, which were mentioned by workers in both Kigali and Nyabiheke. This pattern is consistent with the connectivity usage and needs survey findings: only 31% of all respondents can access Wi-Fi anywhere at all, and among those who do not use the internet, the cost of data (29%) and the cost of an internet-enabled handset (21%) are the most commonly cited barriers. Among non-digital workers specifically, lack of a suitable device is the second most cited barrier to participation in digital work (52%), reinforcing what focus group participants described: without the right device, engagement with the digital economy is effectively out of reach.

Even among those already doing digital work, connectivity quality is a daily consideration rather than a given. Experiences vary considerably within the same camp and are shaped by location, time of day, and whether workers can access Wi-Fi, as these workers in Nyabiheke illustrate:

> ***"The connectivity is generally good, I rarely face interruptions."*** – Worker, Nyabiheke

> ***"The connection is average, it can work but video calls sometimes lag."*** – Worker, Nyabiheke

> ***"The network is not very strong in my area, I experience frequent interruption."*** – Worker, Nyabiheke

4. Drivers of Digital Work

Awareness of digital work appears to be driven primarily by social networks. During FGDs, most workers stated that they found out about digital work through friends and family or through NGOs in their local area. Some also noted finding out through social media and YouTube. Motivation for undertaking digital work is strongly attached to seeing others earning, suggesting a strong role for pioneers already working online to inspire and sensitize the opportunity for their peers.

> ***"I saw my elder brother doing it and earning good money … I got interested and inspired to study and [pursue] it …" –*** Worker, Kigali

> ***"I learned about online work from friends who were already doing it." –*** Worker, Nyabiheke

> ***"I learned about online work from training program I attended." –*** Worker, Nyabiheke

> ***"I learned about online work during university through social media and LinkedIn. I wanted flexible work and a career that allows continuous learning." –*** Worker, Kigali

The motivations workers describe go beyond income alone. While financial necessity and limited formal employment opportunities are common drivers, many workers also speak of self-determination, skills development, and the specific freedom that location-independent work can offer people whose options are otherwise constrained by their refugee status.

> ***"My motivation was survival and dignity. I wanted a skill that is not limited by my refugee status or physical location." –*** Worker, Kigali

> ***"I was motivated by curiosity and the desire to learn skills that could help me earn independently." –*** Worker, Kigali

Skill development pathways are diverse amongst workers, with NGOs playing a strong role, particularly for camp based refugees. Those in Mahama and Nyabiheke have largely relied on training through organizations including ALIGHT, Caritas, and Maison Shalom. Trainings covered a range of topics at varying levels, from coding or online marketing to basic computer skills. Workers in Kigali, by contrast, draw on a more varied mix of university education, structured programs such as the Andela Fellowship and SheCanCode, and self-directed learning through Coursera, YouTube, and AI tools.

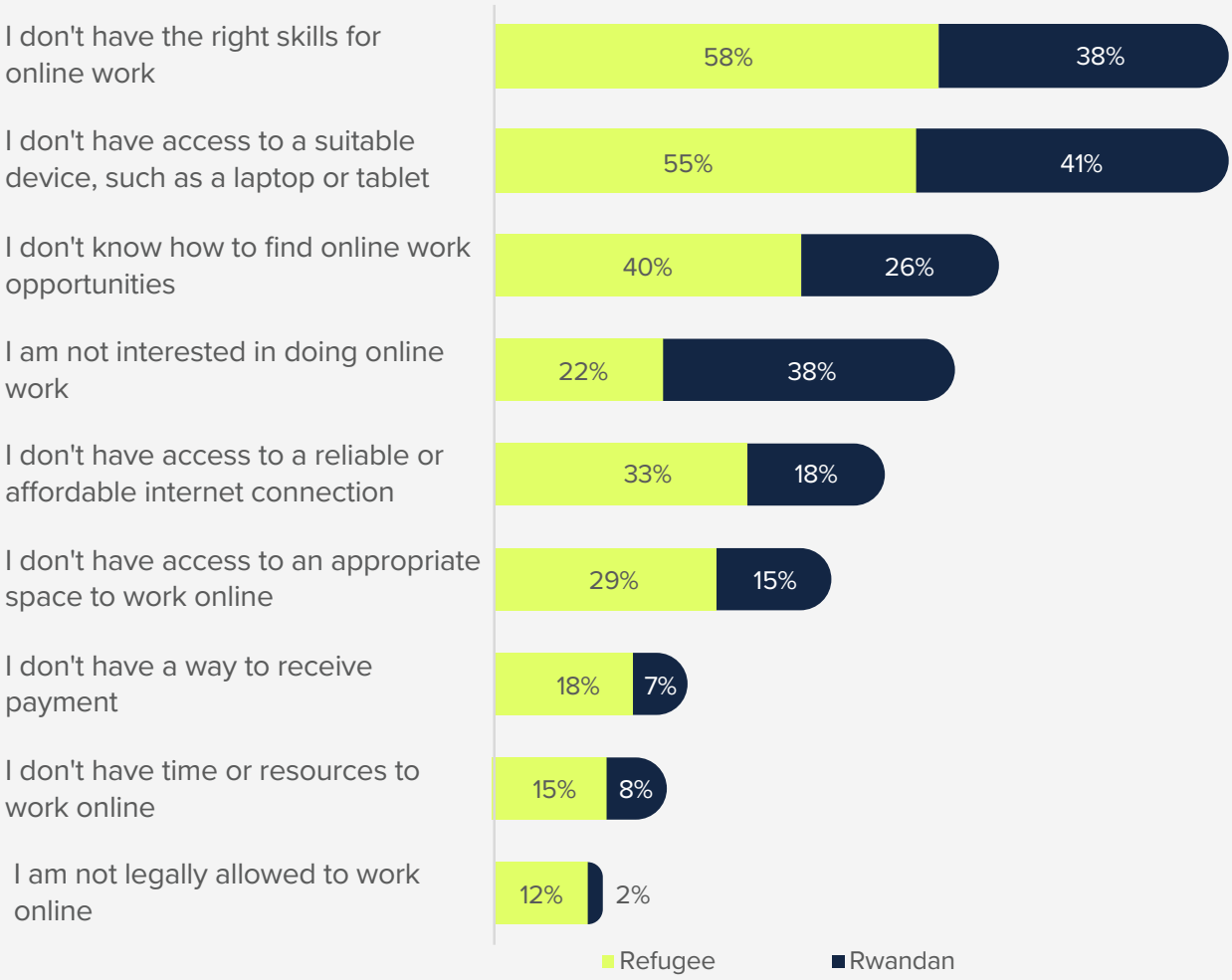
> ***"I discovered online work while studying IT and seeing developers working remotely for international companies."*** – Worker, Kigali

> ***"I have received training from CARITAS RWANDA for around 3 months."*** – Worker, Mahama

> ***"I didn't receive any official courses or training, but I trained by my husband about how online business works and overtime I gained experiences."*** – Worker, Mahama

5. Challenges and Barriers Associated with Digital Work

Figure 15: **Barriers to digital work participation, among non-digital workers**



What are the main challenges that would prevent you from doing digital/online work? Please indicate all that apply. (n=1,608, all respondents who had not undertaken digital work in the past year.).

Among non-digital workers who have considered digital work:

Lack of Skills

Lack of a suitable device

Don't know how to find opportunities

Despite genuine interest and motivation among both current and aspiring digital workers, challenges across key areas prevent participation from reaching greater scale (**Figure 15**).

Connectivity and Infrastructure

Cost and reliability of internet access are recurring themes, though they manifest differently depending on whether someone is already doing digital work or not. For current workers, unstable connectivity is the most commonly raised operational challenge, a daily constraint on productivity. For non-workers, it sits behind skills and device access as a barrier, but remains significant: without affordable and consistent internet, the question of skills or opportunities becomes secondary.

> ***"Even those who have some skills for online work have no equipment such as smartphones or computers to perform those tasks."*** – Non-digital worker, Mahama

Digital Skills

Lack of skills is the single most cited barrier to digital work overall (54%), and rises to 63% among the subset of non-workers who have thought about doing digital work but haven't yet taken it up, suggesting that the more seriously people consider it, the more they recognize what they are missing. This is not simply a question of having no digital skills at all: many non-workers have received basic digital literacy training through NGOs, but what they have learned is how to use a smartphone, navigate basic applications falls short of what is needed to find clients, complete tasks, and earn consistently online in a competitive global market. For some, English presents an additional obstacle, making it harder to navigate international platforms and communicate with potential clients even where the underlying skills exist.

> ***"Some of us take training from NGOs about using a basic smartphone but nothing specifically about online work, and some of us don't know where courses about online work are taken."*** – Non-digital worker, Kigali

Linkages to Work

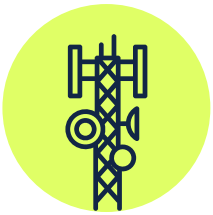
Not knowing how to find opportunities is the third most cited barrier (37%), and points to a structural gap between learning and earning that needs further attention. This is reinforced by the data on how current workers found their way in, primarily through friends, family, and social media rather than formal channels, suggesting that access to the right networks is as important as access to the right tools. Those without those connections, including many urban refugees who lack both the NGO support available in camps and the established networks of host community members, face a particular disadvantage. This may help explain why in Kigali, where connectivity and device access are relatively strong, only 13% of urban refugees have done digital work compared to 37% of Rwandan nationals. Fear of scams compounds this further, particularly in Mahama, where direct experiences of fraud among peers have generated broader distrust of online work, raising the threshold of confidence needed before people are willing to try.

> ***"Others have seen friends who did online work but ended up being scammed, so we are afraid to engage in any online work or business."*** – Non-digital worker, Mahama

Socio-Political Factors

Gender cuts across all of the above. Women report device access as a barrier at a marginally higher rate than men (57% compared to 52% of male refugees), and are more likely to cite lack of time due to household responsibilities (18% compared to 13%). These are not purely individual constraints, they reflect broader social conditions that programming will need to explicitly account for. Among older non-workers, the dynamic shifts considerably: 41% of those over 50 report no interest in digital work compared to 18% of those under 49, suggesting that relevance and accessibility, as much as skills or infrastructure, shape who feels digital work is even a possibility.

Conclusions and Recommendations



Coverage

While Rwanda enjoys strong national coverage, refugees are less likely to have access at home and more likely to need to travel to access connectivity or live in areas with no nearby coverage at all. Connectivity performance in camps also falls below national average speeds, with additional differences observed between individual camps. With high mobile penetration rates in Rwanda, both refugee and host communities reported high use of mobile (87% reporting using a phone at least once a week), with only 10% of respondents saying that they never use a phone at all. This suggests that with even greater coverage, increased usage and demand for services is likely to follow.

Recommendations

- Collaborate with mobile network operators to enhance existing sites or establish new radio tower sites in refugee-hosting areas would likely improve the reliability and reach of mobile connectivity. Approaches may vary depending on local conditions and constraints, ranging from adjustments to existing radio equipment to establishment of new tower sites in areas where terrain, such as hilly topography, currently obstructs signal coverage. Mahama, Mugombwa, and Nyabiheke should be prioritized given below national average connectivity performance.
- Deploy Wi-Fi access networks in and around refugee-hosting areas could also be considered to extend connectivity from locations with strong network coverage to nearby areas where coverage remains limited. Such interventions would help reduce disparities in connectivity between different regions and communities across refugee camps.

Device and Airtime Affordability

Smartphone ownership stands at 58% across both refugee and host communities, with broadly comparable rates between the two groups. However, those without access remain excluded from meaningful internet engagement and digital work opportunities. Cost of devices and airtime are identified as the primary barriers to mobile device and internet use across refugee-hosting regions, with a significantly higher proportion of refugees citing this constraint. Affordability therefore represents a critical challenge to increased mobile internet adoption in these areas.

Recommendations

- Collaborate with mobile network operators and device manufacturers to develop low-cost smartphone options and airtime bundles tailored to the financial realities of refugees and host communities.
- Engage with financial inclusion stakeholders, including government, development actors, and private sector, to expand access to instalment-based or micro-financing options for device acquisition, lowering barriers to smartphone ownership in refugee-hosting regions.
- Leverage proven subsidy mechanisms (e.g., financing de-risking schemes, blended funding models) to make quality devices more accessible and reduce the upfront cost burden on vulnerable households.
- Explore zero-rating or discounted data access for key services, reducing the ongoing cost of connectivity for those least able to afford it.

Digital Divides

Women, people with disabilities, and those over 50 across refugee and host communities consistently report lower levels of access and usage. These groups face compounding barriers, including device affordability and low digital literacy. Not knowing how to use a phone is notably more prevalent among older age groups, limiting the impact of investments in coverage and device ownership.

Recommendations

- Design and fund targeted digital inclusion interventions in collaboration with private sector, government, and community organizations that explicitly address the needs of women, people with disabilities, and older populations, ensuring interventions are tailored to the specific barriers each group faces rather than applying a one-size-fits-all approach.
- Deliver outreach and support in accessible and safe settings, reducing social and cultural barriers to engagement with digital services. This includes ensuring training environments and work spaces are designed to be women-friendly, with consideration for safe space standards, female facilitators, and flexible scheduling that accounts for household responsibilities - recognising that for women, the environment in which support is delivered is as important as the support itself.
- Expand access to digital literacy and skills programs with dedicated content for older adults, women, and other underconfident users that account for varying skill levels and the distinct digital challenges / risks each group faces.

Variance by Location

Location appears to determine access and usage than refugee or host community status, with phone ownership ranging from 87% in Kiziba and Mahama to 95% in Kigeme, and home internet coverage spanning from 52% in Nyabiheke to 91% in Kigeme. The gap between refugee and host communities within the same location is also notable, though its direction is inconsistent: in Kiziba and Mugombwa, refugee communities report better coverage access than their host counterparts, while in Mahama the reverse is true.

Recommendations

- Leverage existing location-specific connectivity insights to design and prioritize tailored interventions for each refugee-hosting region, ensuring programming and investment decisions reflect the distinct access, coverage, and usage profiles identified across locations.
- Ensure interventions explicitly target both refugee and host communities within each location, recognizing that the direction and scale of access gaps vary by region and that host communities in particular risk being overlooked in refugee-focused programming.

Access to Digital Livelihoods Opportunities

Rwanda's policy environment offers refugees a genuine platform to participate in the digital economy; the right to work, growing connectivity infrastructure, and a government committed to digital transformation. The data suggests the will is there too: 75% of refugees have heard of digital work, and nearly one in five have already done it. But awareness and aspiration are not fully translating into participation at scale. The reasons are practical rather than motivational with skills, devices, and pathways to work are the three most cited barriers, each compounding the others.

Recommendations

- Invest in market-aligned digital skills training in collaboration with private sector employers and platforms, moving beyond foundational digital literacy to high-growth sector-specific skills such as content creation, data work, and software development. English language skills should be embedded throughout, and content regularly adapted to reflect shifting market demand.
- Develop sustainable, refugee-led digital work spaces in partnership with community organizations and local government, providing reliable connectivity, devices, and a safe working environment. Outreach and support should be delivered in accessible and safe settings to reduce social and cultural barriers to participation, with dedicated provision for women who show the sharpest gap between awareness and participation.
- Expand access to devices through subsidised schemes, device lending, or instalment-based financing targeted at aspiring digital workers, recognising that communal work spaces alone cannot substitute for individual device ownership.
- Test and scale linkages to work through structured engagement with employers, platforms, and intermediaries, including dedicated support for new entrants to build portfolios and client reviews.
- Integrate digital safety and fraud awareness into all skills training programs and support peer networks of established digital workers as a trusted source of guidance for those taking their first steps into the digital economy.

Annex A

Methodology

This study relies on a mixed methods approach using both qualitative and quantitative data, including mobile coverage mapping, quantitative connectivity needs and usage survey covering mobile and internet use and access and digital work, and qualitative focus group discussions on digital work.

1. **Mobile coverage mapping** was designed and deployed by UNHCR and Ericsson Response to understand signal strength and quality in all five camps (Mahama, Nyabiheke, Kigeme, Mugombwa, and Kiziba).

   The Ericsson Response coverage mapping solution consist of a CradlePoint R1900 with a docking station (See Figure) which includes an independently working modems that can hold two SIM each.

   Ericsson Response Solution

   During the assessment, Ericsson Response and UNHCR staff drove and walked set assessment routes around each refugee camp to collect data using three CradlePoints. Each CradlePoint took periodic 3G and 4G measurements of available mobile networks (e.g., MTN, Airtel, KtRN) via the modems. A total of 21,414 results were generated within the camp boundaries on signal availability and quality on between October 24-30, 2025. The collected data was then visualized on a software to draw insights on network signal availability and quality.

   In parallel, the ITU ran a nationwide crowd-sourced Speedchecker measurement campaign between October 10-31, 2025, which collected 43,236 results over three weeks. This gives a national baseline against which to benchmark the results received from refugee camps. In addition, the Ericsson Response team also downloaded and installed the Speedchecker Android app to collect measurements whilst running the drive test for control purposes. This collected 28 results October 29 and 30, 2025 in Kigeme and Kiziba refugee camps, and can be used to compare results from ER against Speedchecker.

   To further strengthen correlation across findings, ITU also computed predicted 2G, 3G and 4G cellular coverage for one providers' cell site data using the Mobile Coverage Platform (MCP) subsystem of the ITU Disaster Connectivity Map (DCM) developed by Mase Analytics and CloudRF. It produces strong, medium and weak signal strength coverage for each individual 2G, 3G and 4G cell site, and cell site coverages are merged together to create a national coverage map, cross-checked with satellite imagery to verify tower locations.

2. **Connectivity needs and usage survey** was adapted from the GSMA Connectivity, Needs and Usage Assessment (CoNUA) toolkit and tailored to the specific refugee context in Rwanda. The survey collected representative quantitative data from refugee and host communities at the individual level across all five camps and urban Kigali. The tool was deployed in Rwanda by UNHCR in partnership with ALIGHT Rwanda, with additional analysis and inputs from KPHR Inc.

   Between November 19 – December 20, 2025, a total of 2,040 surveys were collected in 6 regions by the ALIGHT team trained enumerators, including 5 refugee camps and 5 host communities in the same area, as well as urban refugees and host community members in Kigali, to explore key differences between refugees and host communities. Desk-based research also provided data and insights to inform the analysis.
   Data cleaning was carried out by KPHR Inc., including correction of location (10 entries where location recorded did not match timestamp and location of enumerator the rest of the same day), and exclusion of entries with no citizen status or misalignment between citizen status and location (52 entries).

   After data cleaning and validation, 1,988 survey responses were included in the sample, with a notably large representation of refugees in Mahama (49% of the sample); 81% of total respondents were refugees and 53% of respondents were women. Basic descriptive statistics were carried out per survey question, exploring themes of mobile phone access and use, internet access and use, and digital work. All questions were analysed in aggregate and disaggregated by citizen status to explore key differences between refugees and host communities. Key questions were also disaggregated by gender, age, disability, literacy and country of origin to better understand the experiences of different demographic groups. Key questions were also disaggregated by location to identify regional differences and camp/urban environment differences.

3. **Six focus group discussions (FDGs)** conducted by ALIGHT Rwanda in 3 locations (Kigali, Mahama, Nyabiheke) of refugee and host community digital workers and non-digital workers. These were interpreted to identify common themes and patterns and explore differences by location. The FGDs were hosted between November 19 – December 20, 2025.

Annex B

Connectivity Needs and Usage Survey Respondent Demographic Breakdown

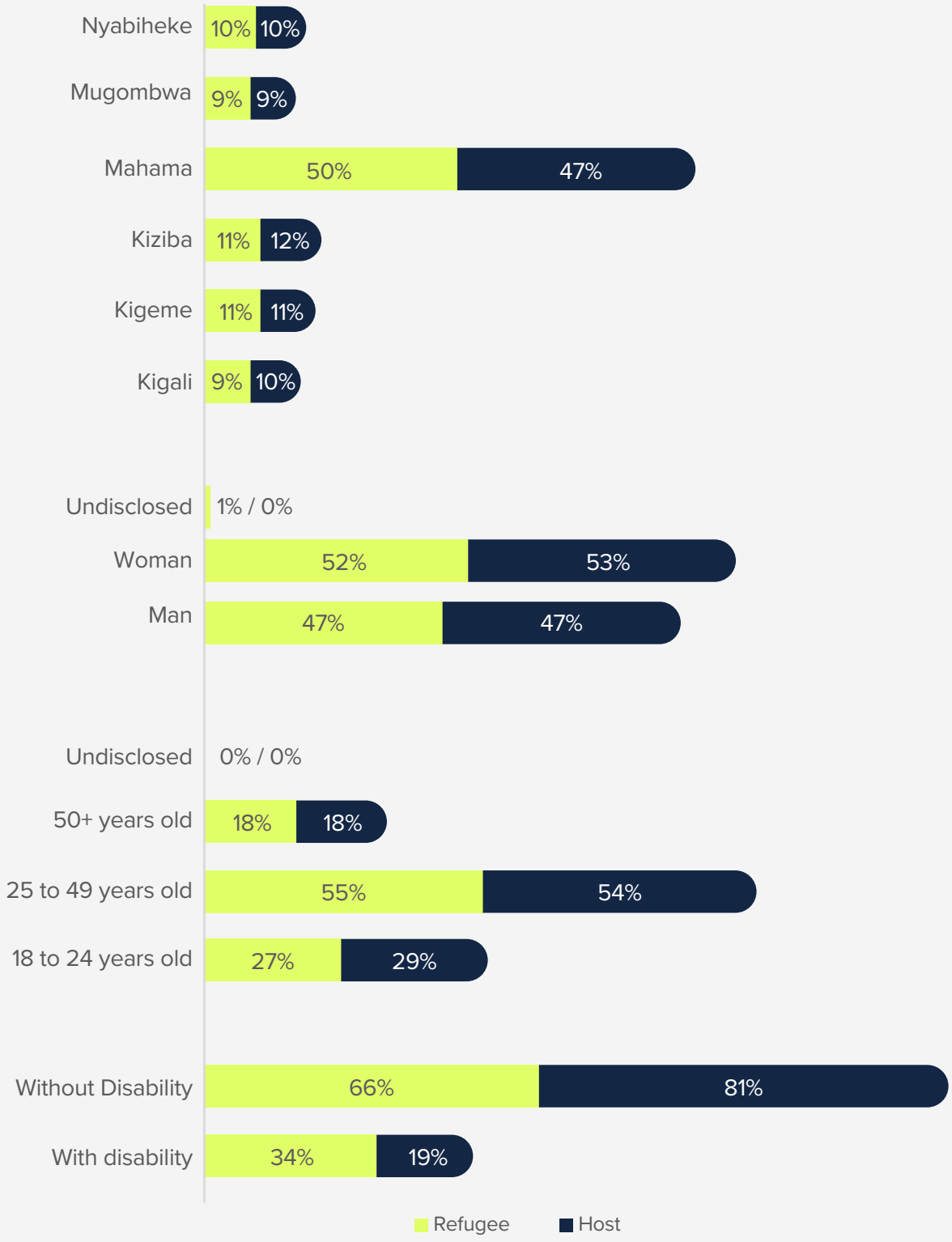
Between November 19 – December 20, 2025, a total of 2,040 surveys were collected in 6 regions, including 5 refugee camps and 5 host communities in the same area, as well as urban refugees and host community members in Kigali (**Figure 16**).

The survey sample was designed to reflect the demographic profile of the refugee population in Rwanda, with location, gender, and age distributions closely matched to official population data across the six surveyed sites. The sampling frame covers approximately 95% of adult refugees in Rwanda, with an 80/20 split between refugee and host community respondents to compare both groups' experiences. The sampling methodology was appropriate and aligned to the GSMA Connectivity, Needs and Usage Assessment (CoNUA) toolkit and the survey design and objectives. Ensuring representative samples in every individual location would require significant additional capacity. As such, disaggregated location data is presented as some interesting differences by location found, which could warrant further exploration with other evidence, but caution is advised against using this data alone for specific location-based recommendations (particularly related to host communities).

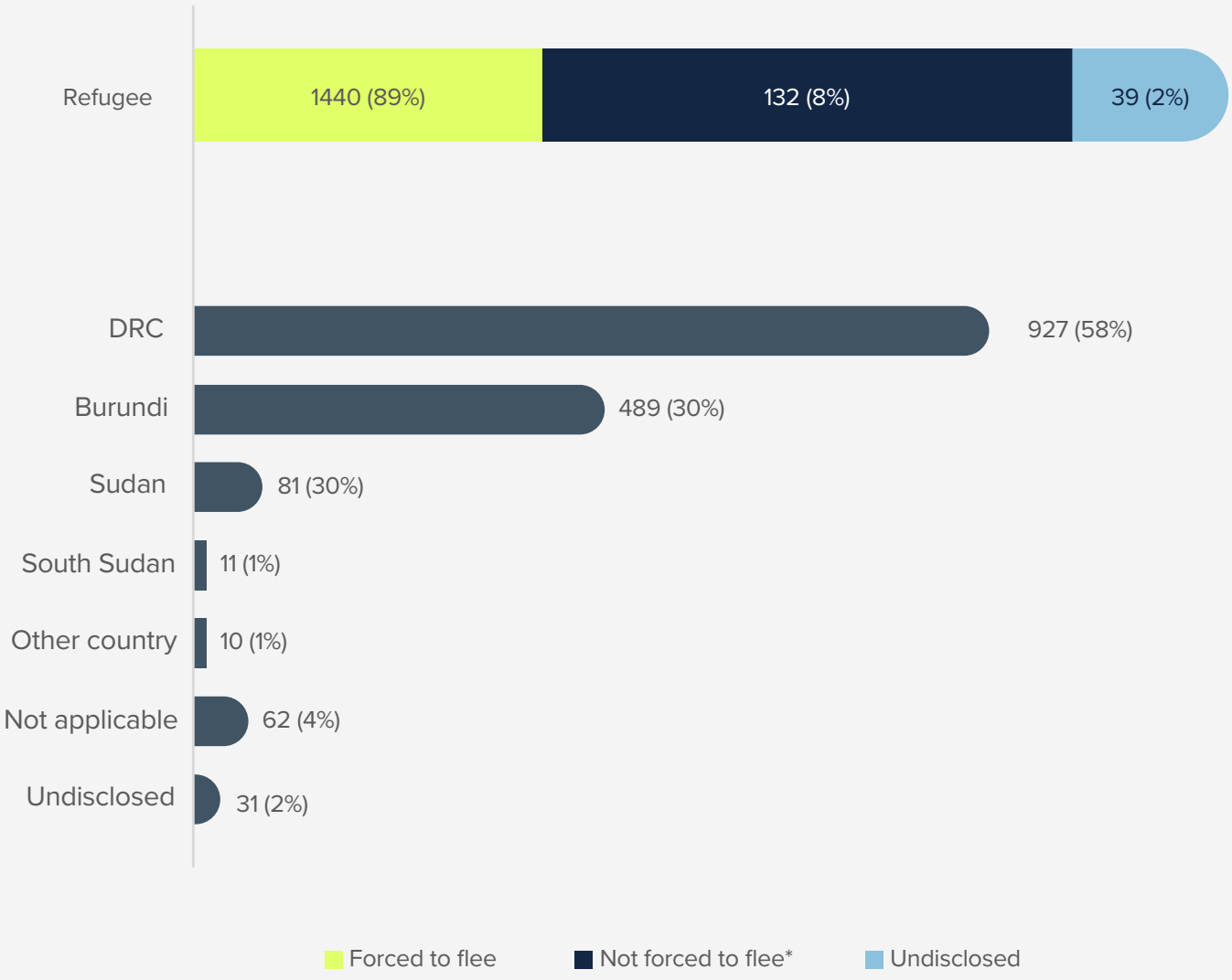
Overall, it is worth nothing that:

- 31% of respondents experience a disability (at least some difficulty seeing, hearing, walking, remembering and being understood). This was notably higher among refugees (34% experience a disability, compared to 19% of the host community).
- Separately from disability, respondents were asked if they could read and write. A total of 84 said they were unable to read or write (4%). This included 75 refugees (5%) and 9 host community participants (2%).
- The majority of refugees in the overall sample were from DRC (58%) followed by Burundi (30%). Whilst this aligns with DRC and Burundi being the top two origin countries for refugees in Rwanda, the sample included a greater proportion of refugees from other countries (7%) than are currently residing in Rwanda in reality (0.5%).
- Young adults born in refugee camps may never have been forced to flee, and of these respondents, some gave a country of origin, or this information was not disclosed or considered not applicable.

Figure 16: **Total survey responses demographic breakdown - Citizen status, gender, age and Disability**



Question: *What is your citizen status?* Total sample: 1988
Question: *What is your gender?*
Question: How old are you? Provide best guess if unknown.
Question: *Do you have difficulty seeing, even if wearing glasses? / 10. Do you have difficulty hearing, even if using a hearing aid? / Do you have difficulty walking or climbing steps? / Do you have difficulty remembering or concentrating? / Using your usual (customary) language, do you have difficulty communicating, for example understanding or being understood?*



Question: *Have you ever been forced to flee your habitual place of residence? / 6. a. If yes, where were you residing before being forced to flee?*

Annex C

Limitations on Assessment Approaches

Mobile coverage mapping: First, for connectivity mapping, it is recognized that results shown are a snapshot in time, showing the state of networks on the day in question. Measurements such as download speeds are heavily influenced by the number of users connected at a given moment and the types of activities they are engaged in. Furthermore, individual sites and cells may be temporarily out of service, either due to faults or to planned works, impacting the signal characteristics in a given area. Secondly, they reflect the state of the network as seen by an outdoor user. Buildings absorb radio frequency energy (the exact amount depending on the construction material used) so that the coverage levels observed by an indoor user are always lower than for their outdoor counterparts.

Connectivity needs and usage survey: Data quality and reliability was limited. The most significant factor was issues with survey skip logic resulting in enumerators asking people questions that were not relevant, and respondents giving contradictory responses. To minimise this, questions were filtered to relevant respondents only. Time and capacity for data analysis was limited; as a result the data was explored primarily through basic descriptive statistical analysis. Analysis of key differences using chi-square tests was performed for key questions, but it was not possible to undertake this level of analysis across all questions and demographic groups.

Survey respondents were sampled to ensure the location breakdown was proportional to the size of the camps. This provided an overall representative sample of the Rwanda refugee population (where the margin of error is less than 5%). The sample in Mahama Refugee Camp also met this level of precision. However, in smaller camps, margins of error were slightly higher (approx. 7-8%), reflecting slightly lower precision at the individual location level. It was not possible to calculate margins of error for host communities, which were intended to provide comparative context rather than be statistically representative. As such, disaggregated location data outside Mahama Refugee Camp should be interpreted as an indication of trends. This limitation is typical of a survey of this size and capacity.

Focus group discussions: Participants were purposively selected and may reflect those already engaged with ALIGHT or more motivated to participate, introducing potential selection bias. Differences across locations may also reflect local contextual factors not fully captured in the analysis. As such, the findings are indicative rather than generalizable.

Annex D

Digital Divides by Camp

The table below presents results from the connectivity usage and needs survey across all locations, split by refugee camp and host community.

Location	Count	Phone ownership	Device ownership	Home mobile network coverage	Home internet coverage	Most commonly used network	Digital work in past year
Kigeme	**228**	**95%**	**21%**	**96%**	**91%**	**4G**	**32%**
Kigeme RC	185	94%	19%	96%	91%	4G	32%
Kigeme Host	43	100%	30%	95%	90%	4G	30%
Kiziba	**217**	**87%**	**25%**	**69%**	**61%**	**4G**	**20%**
Kiziba RC	171	88%	28%	71%	64%	4G	23%
Kiziba Host	46	83%	13%	62%	48%	4G	7%
Mahama	**975**	**87%**	**13%**	**73%**	**60%**	**4G**	**17%**
Mahama RC	799	86%	8%	69%	56%	4G	19%
Mahama Host	176	89%	35%	95%	89%	4G	6%
Mugombwa	**185**	**90%**	**23%**	**89%**	**74%**	**4G**	**11%**
Mugombwa RC	150	93%	27%	97%	86%	4G	13%
Mugombwa Host	35	77%	3%	53%	20%	2G	3%
Nyabiheke	**193**	**88%**	**11%**	**63%**	**52%**	**3G**	**19%**
Nyabiheke RC	154	90%	12%	56%	49%	3G	20%
Nyabiheke Host	39	82%	5%	94%	78%	2G	15%
Kigali urban	**190**	**99%**	**28%**	**90%**	**89%**	**4G**	**18%**
Kigali Refugees	152	99%	20%	88%	85%	4G	13%
Kigali Rwandans	38	100%	61%	100%	100%	4G	37%
Total	**1,988**	**89%**	**17%**	**78%**	**68%**	**4G**	**19%**

Annex E

Undertaking Digital Work, with Detailed Gender Breakdown

Digital Work	Yes		No	
Total	**372**	**19%**	**1,608**	**81%**
Citizen status				
Refugee (1,604)	325	20%	1,279	80%
Host (376)	47	12%	329	88%
Gender				
Woman (1,039)	160	15%	879	85%
Man (932)	209	22%	723	78%
Woman - refugee (840)	142	17%	698	83%
Man - refugee (755)	180	24%	575	76%
Woman - host (199)	18	9%	181	91%
Man - host (177)	29	16%	148	84%
Age				
18 to 24 years old (536)	119	22%	417	78%
25 to 49 years old (1,092)	231	21%	861	79%
50+ years old (347)	21	6%	326	94%
Disability				
Not disabled (1,363)	267	20%	1,096	80%
Disabled (617)	105	17%	512	83%
Literacy				

Can read/write (1,896)	372	20%	1,524	80%
Cannot read/write (84)	0	0%	84	100%
Refugee origin				
DRC (922)	190	21%	732	79%
Burundi (488)	87	18%	401	82%

During the past year, have you done paid work online (e.g. E-commerce, data tasks (entry/transcription) or content creation) for payment etc.)?

CONNECTIVITY FOR REFUGEES

Inclusive Digital Economy Alliance

Connect with us

hqconref@unhcr.org
rwaki@unhcr.org