Exile Within Borders: Understanding the Limits of the Internally Displaced People (IDPs) in Iraq

Dina Sabie[1]   Samar Sabie[2]   Cansu E. Dedeoglu[3]   Yasaman Rohanifar[1]

Fatma Hashim[4]   Steve Easterbrook[1]   Syed Ishtiaque Ahmed[1]

[1] Computer Science
[3] Faculty of Information
University of Toronto
Toronto, Canada
[1] {dsabie, yasamanro, sme, ishtiaque}@cs.toronto.edu
[3] cansu.dedeoglu@mail.utoronto.ca

[2] Information Science
Cornell University
New York, USA
sks286@cornell.edu

[4] Al-Mesalla Organization for Human Development Iraq
Erbil, Iraq
fatma.hashim4@gmail.com

ABSTRACT

Research in ICT about forced displacement focuses mainly on refugees. Internally displaced people (IDPs), however, are rarely discussed in ICT and related disciplines. This paper aims to fill in the gap and provide an insight into the everyday lives of conflict-driven IDPs and their ICTs usage based on our original fieldwork at several IDP and refugee camps in northern Iraq. Our work includes extended field observations, surveys with 86 IDPs and 47 refugees, and examination of recent reports about IDPs from international NGOs that have been active in that region. Our findings illustrate that IDPs live under similar resource-constrained environment as refugees and, in some cases, suffer from even harsher restrictions. We highlight how these confines limit their ICTs usage and discuss opportunities for future ICT research and policy implication to improve the quality of life of the displaced residing within their own borders.

CCS CONCEPTS

• Human-centered computing → Collaborative and social computing → Collaborative and social computing theory, concepts and paradigms → Social recommendation • Social and professional topics → User characteristics → Cultural characteristics

KEYWORDS

Forced displacement, IDP, refugees, access, ICTD, Iraq.

1 INTRODUCTION

Internally Displaced People (IDPs) are individuals who leave their homes seeking safety against natural or manmade disasters and who do not cross the country's borders [71]. Because IDPs stay within their own country, they remain under their state sovereignty.

Refugees, on the other hand, cross a border to find protection. Hence, they fall under the protection of international laws [41]. In some cases, IDPs, especially ones who are displaced due to natural disasters, are aided by their own governments and can rebuild their lives after a period of time [62]. However, IDPs who flee due to conflicts tend to be more vulnerable because they are usually marginalized by their own government and have limited access to adequate services [89]. In fact, the number of displaced people globally is always on the rise due to conflict-induced IDPs who have been without durable solutions for an extended period of time [66, 93]. The magnitude and complexity of forced displacement today are directly linked to the prevalence, scale, and longevity of the current conflicts where some countries are still struggling despite 20 years of international, regional, and national policy efforts and investments [48, 69].

IDPs produced by conflicts are widely discussed in diverse types of literature, including political science, international law, and economy [9, 46, 60, 83]. However, research about them in the field of technology is minimal. When discussing displaced population, ICT related research usually focuses on refugees even though, in many cases, IDPs and refugees flee from similar root causes [81]. We believe that one of the main reasons IDPs are understudied is because there is a lack of readily available detailed data about them [12]. While the Internal Displacement Monitoring Centre (IDMC) [49] does publish data about IDPs in terms of numbers of the displaced by country and the economic implications associated with such movement, more specific data such as people demographics and services available for them is hard to find. This can be due to difficulties in accessing IDPs because they fall under their local government jurisdiction which, in many cases, does not allow external interferences [18]. Moreover, certain types of data - such as news articles and tweets -that rely on Internet coverage may not be available in countries experiencing large-scale displacement [63].

We argue that there is a need to conduct more research about conflict-induced IDPs to better understand the circumstances they are under and to propose possible aiding tools that can be appropriate for their needs and context. Hence, the goal of this paper is to provide detailed data about conflict-driven IDPs who reside in camps and advise on strategies for improving their quality of life. To achieve this, we visited 2 IDP and 2 refugee camps in northern Iraq and conducted surveys with 86 IDPs and 47 refugees in these and other nearby camps. Building on the work of Sabie et al. [77]

that discusses the difference in shelter design between IDPs and refugees in Iraq, we use a set of ethnographically informed methods, including observations and surveys, to illustrate the situation of the internally displaced, report on IDPs usage of ICTs, compare IDPs with refugees from nearby Iraqi camps (using our own data) and neighboring countries (using other scholars' work), analyze the findings, and discuss design and policy implications.

2 BACKGROUND

The number of IDPs surpasses the number of refugees by a fold and a half [33]. According to the latest data, in 2017 only, there were more than 18 million newly internally displaced people due to natural disasters while over 11 million fled conflicts but stayed within their country's borders. Currently, close to 40 million conflict-induced IDPs exist worldwide, and the majority are located in Sub-Saharan Africa and the Middle East [48]. The number of IDPs is not going down. While some IDPs return to their homes when the crisis they ran from ends, most IDPs who flee due to political conflicts suffer from protracted displacement and are yet to find durable solutions [43].

IDPs do not receive adequate attention from the international community [91]. In practice, the international regime for the protection of IDPs is arguably quite weak. Although they flee their homes for mostly the same reasons as refugees, IDPs are not protected by the same international treaties and institutions as refugees are, since they do not cross any internationally recognized borders. In fact, until the late 1990s, IDPs were not protected by any international institutional or legal framework [15]. In 1998, the UN Guiding Principles on Internal Displacement (GPs) was created to detail the rights and guarantees relevant to the protection of IDPs from forced displacement to their protection and assistance during displacement up to the achievement of durable solutions [71]. However, the GPs are not binding. Their wording is purposely very general and vague. Moreover, because the regime is based on "soft law," it lacks robust international enforcement and monitoring mechanisms [15]. Compliance with the IDP regime has been patchy at best. As evident by multiple studies and reports [7, 32, 89, 91], there has been a notable gap between commitment and implementation of the IDP norm-based laws and policies.

In general, IDPs produced by political conflicts are usually at a higher risk than refugees. Assistance to IDPs, as compared with refugees, is more sporadic and their livelihood is more fragile because IDPs are living in countries subject to civil strife or, in some cases, the local government prevents the interventions of outsiders as it would be considered an intrusion over the state's sovereignty [15]. Moreover, populations in conflict zones may be repeatedly displaced and are highly vulnerable [31]. Lastly, refugees have the option of being resettled, i.e. being relocated in a new country where they can start a new life. However, IDPs are generally not eligible for a third-country resettlement [92]. Very few states have special humanitarian migration programs for persons at risk within their own country, such as the U.S. Refugee Admissions Program that processed Iraqi asylum seekers requests while they were in Iraq between 2007 and 2013 [53].

The humanitarian and displacement situation in Iraq is one of the most severe in the world. The country has been in political conflicts since the early 1980s [40] but the last 15 years - driven by a combination of internal armed conflict, external intervention, and political, ethnically or religiously motivated persecution – have produced over 10 million refugees and IDPs (about 25% of the current country's population) [52]. Figure 1 illustrates the IDP

trends in Iraq. While the last year has witnessed the return of millions of IDPs to their home, the number of people who remain internally displaced is still significant. Moreover, not all these returns can be considered voluntary as it is unclear what percentage of those returnees have been able to reach durable solutions in their place of origin or elsewhere, partly as a result of damaged housing, severely disrupted services, and security concerns [78, 85].
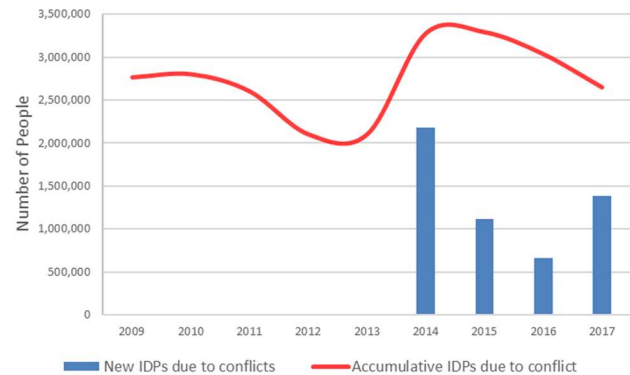

Figure 1: IDP trends in Iraq over the last decade [50]

3 RELATED WORK

3.1 Mobility, Classification, and Discrimination

Everything around us is on the move. People, materials, and ideas are mobile, Research on 'mobilities' studies the effect of such movement on power and inequality in society. This is because not everyone is able to take advantage of the advances in infrastructure and technology that benefit mobility. People's ethnicity, location, gender, education and relative wealth can – among other factors – profoundly affect their levels of mobility [22]. A person's mobility may be framed by the social and financial situation and peer-group structures in their lives. Social and spatial mobility affect people's ability to travel, to gain educational qualifications, or to find work and settle in a new place. Also, the logistics, costs, technology, and infrastructure of travel matter significantly for mobilities [29]. In our context, as Urry [94] argues, the displaced often make long, dangerous journeys until they find safety. In the process, many lose their financial resources and social support, and find themselves detained, unable to work or to afford travel. This initial physical mobility drastically limits their mobility once they find safety. Displacement is inherently spatial. However, space does not merely refer to a physical location. Space, as Massey [64] explains, is any locality with social relations, a network in which connection creates culture. Our experience with space is determined by several factors such as gender, ethnicity, capitalism, and service access. There are people who can move and communicate freely by compressing time and space using digital tools. However, with displaced people, even though they experience physical movement, they are confined due to the politics and values of the hosting site. This disparity in mobility can weaken the leverage of the already weak [65].

While people that are subject to forced mobilities are already in an abject condition, a classification between refugees and IDPs further exacerbates the scenario. Refugees are eligible for many international aids and protected by many international laws that cannot help the IDPs. This discrimination asserts the problems with enforcing a rule-based classification upon people. Bowker and Star [14] have opined that people are often classified and judged based on their gender, race, education, financial status, and their original

parent's class – upon which they often have little control. Marginalization is the byproduct of how society classifies people. This results in inadequate access to information about them. Because the displaced population tends to be marginalized, they are underrepresented by community and government support [57]. Although IDPs and refugees are forcibly displaced mostly for the same reasons, just because of the geographical location, which is again a result of classification in lands and nations, IDPs have to suffer greater limitations and are deprived of international regard and aid that their refugee peers receive.

Hence, IDPs present a compelling case of intersectionality where they are subject to marginalization both by forced mobilities and biased classifications. While research and study on intersectionality have been common in different branches of social and political sciences, ICT and related fields have only recently started to focus on developing methods for such intersectional research [80, 95, 96]. However, due to the uniqueness of the case of IDPs, existing methodological tools are often difficult to apply. As a result, little is known about the struggles of IDPs and their connections with computing technologies. Our study focuses on this understudied, and yet crucial, intersection to understand the limits of computing and to design for overcoming them.

3.2 Long-Term Displacement and ICT

A growing body of ICT research has been active in refugee camps and refugees' informal settlements to identify the challenges these displaced people suffer from and recommend design practices. For example, in Lebanon, Talhouk et al. [88] identify contextual and cultural factors that can inform the design of digital technologies to support refugees' Access to Antenatal Care (ANC). Accordingly, the authors implemented a radio show run by refugees to deliver healthcare information to the displaced community [87]. In Jalazone Palestinian refugee camp in the West Bank, Aal et al. [1–3] discuss the impact of implementing intercultural computer clubs (come_IN) on youth displaced population. In Za'atari refugee camp in Jordan, Fisher et al. [37] held a series of participatory design workshops with youth refugees to create paper prototypes of visionary devices to help their community. The authors then went on to explore the social, spatial, temporal, and infrastructural challenges that need to be considered when designing the camp cookbook [35]. In terms of ICT presence, Xu and Maitland [97, 98] report that Za'atari camp refugees depend heavily on mobile phones and social media for communication, and there is potential that refugees can carry out Asset Based Community Development (ABCD). Similarly, Yafi et al. [99] describe how youth in this camp carry out digital information and service work on behalf of family and community members given the limitations in Internet access modes. These studies help provide context for the refugee community's daily lives challenges including information problems and limited access to survives. They also emphasize the importance of dialogue between technology designers and the populace affected by humanitarian crises to increase relevance and sustainability of innovations. However, these and similar studies are often lacking when it comes to IDPs who suffer from similar challenges as refugees but in a different context.

In general, IDPs tend to be discussed abstractly in technology research. For example, Martin and Singh [63] identify big data sources, methodologies, and challenges that need to be addressed in order to develop more reliable evidence-based systems for detecting and forecasting forced migration in the context of humanitarian crises. Similarly, Sokolowski and Banks [82] establish a multi-disciplinary methodology for researching and modeling population

displacement to minimize threats to populations in jeopardy and anticipate when forced migration might occur. Kemper and Heinzel [58] illustrate how Earth observation data can be used for mapping and monitoring of refugee and IDP camps. For example, satellite 2D images are used by Wendt et al. [48] to screen growth patterns in IDP and refugee camps and estimate their population. However, very few studies have focused on understanding the challenges of IDPs and designing appropriate technology and policy accordingly.

In ICTD, HCI, CSCW, and related disciplines, IDPs are rarely discussed with a few exceptions. Ahmed et al. [6] demonstrate how communities that are forcefully displaced due to the development projects in Dhaka, Bangladesh experience a residual treatment in their use of ICT, and survive by engaging creatively with the available infrastructures and constructing new modes of access and support. Sabie et al. [77] illustrate the various shelter types that exist in IDP and refugee camps in northern Iraq and highlight opportunities for ICTs to improve the quality of life for these displaced residents through shelter design. Robehmed [76] discusses the user-centered design approaches needed for appropriating Refunite - a tracing platform to help people find their missing family members - for Iraqi IDPs. This body of work, though limited, warrants two important insights to move forward: (a) an understanding of how IDPs perceive, fight, and negotiate challenges associated with displacement, and how these challenges contribute to their overall struggle in settlement, and (b) how such challenges are connected to the inherited local politics. Our study joins this conversation by addressing these two pressing issues and contributes to the scholarship of LIMITS and ICTD by presenting new insights into IDPs everyday lives and ICTs usage within the Iraqi context.

4 METHODS

Two of the authors were born in Iraq and later migrated to North America. One of the authors was born, raised, and still resides in Iraq and she has been working with the IDPs and refugees for the past 5 years. All of these authors are fluent in Arabic. We collected the data in two phases. The first phase was an ethnography conducted by one of these authors. She visited two IDP camps (Baharka and Debaga) and two Syrian refugee camps (Darashakran and Kawergosk) – both in north Iraq - in October 2016 (Figure 2). These camps are located outside Erbil; the capital of the Kurdistan Regional Government in Iraq. The selection of the camps was influenced by access availability and the absence of data on such camps in the literature. During this period, staff members from a local NGO (anonymized for security reasons) took the author with them on their full-day camp rotations. In all the visited camps, NGOs hire local IDPs and refugees, called volunteers, to do most of the work since they live in the camp and know its layout and inhabitants the best. These volunteers are paid for their work. One or two volunteers accompanied the author on walks through the entire camp to ensure her and occupants' safety, respect, and sensitivity. During each visit, the volunteers asked camp residents if they would like to speak to the author and whether it was acceptable for her to photograph the different elements of the camps. At the end of each visit, the author documented (in written notes) her experience and observations and correlated them with the pictures she took. All the pictures shown in this paper are from our fieldwork. We opted against showing the faces of the camps' residents for security and privacy reasons.

Volunteers are obliged by the NGOs to not be authoritative towards IDPs and refugees in order to maintain the occupants' trust. As such, there was no pressure on camp residents to speak to the author.

Figure 2: [left to right] Baharka IDP camp, Debaga IDP camp, Darashakran refugee camp, and Kawergosk refugee camp

Nevertheless, most camp dwellers were cooperative, and many of them would approach the author and start friendly conversations. IDPs and refugees were very comfortable in these interactions and offered many insights about their situation. This could be attributed to the author's demographic characteristics. All these interactions were done in Arabic, and in the cases where some only spoke Kurdish, a Kurdish-Arabic speaking volunteer would interpret. In total, we talked with over 20 IDPs and over 20 refugees. Some of these displaced individuals worked as volunteers for active on-camp NGOs or had their own business such as grocery stores and sweet shops, while the rest were unemployed. Their age ranged from teens to 50s, and the majority of them were females. In addition, the author also had conversations with 10 staff members from the Norwegian Refugee Council (NRC), the Danish Refugee Council (DRC), and the Emirates Red Crescent (ERC). These NGOs handled most of the infrastructure projects in camps.

By the end of this visit, we accumulated initial data about the built environment and the used ICTs in the camps through observations, photos, and informal discussions with staff and camp occupants. We analyzed the preliminary data and accordingly designed a survey to be completed by the displaced population about the built environment they live in and the availability and usage pattern of different ICT devices by them. The survey consists of 36 multiple choice questions and 3 short answer questions (see Appendix 1).

In the second phase, which ran in August 2017, we recruited 86 IDPs and 47 refugees to participate in the survey. Our camp contact, who is an official at a local NGO and has been visiting the camps daily for years, approved the survey and checked the numbers. She also handled the hiring, payments, and data sharing using Viber (her most preferred communication method). She was also the one who handled distributing a paper version of the survey in Arabic in the 4 visited camps plus another two IDP camps: Hasan Al-Sham and Khazer. All of these camps are distanced 10-55 km from the major Kurdish city of Erbil. The IDP camps were established in 2013 and 2014 while the refugee camps started in 2013. The population of the camps ranges between 1,500-3,000 people [24, 56, 102–105].

All of our IDP participants came to the camps between 2014-2017 with the vast majority coming in the second half of 2016. Our refugee participants came to the camps between 2013-2017 with the vast majority coming in 2016. Participants were recruited by asking IDPs and refugees who visit their local NGO office (anonymized for security reasons) to participate in the survey (Figure 6). Because the majority of camp residents visit these offices frequently for assistant and taking part in workshops, we believed that this method offered access to vast population and made sure the recruitment process was done in a formal and safe environment. We stopped at a theoretical saturation, i.e. when no new additional data were found that developed our findings [39]. The participants' demographics are illustrated in Table 1. All participants signed written consent forms and each participant was compensated with IQD 5,000 [1] in

cash for their time (which took around 15 minutes). The collected surveys were scanned and sent to us via Google Drive. They were translated into English when we entered the data electronically. We received approval for all study procedures from our university's Research Ethics Board (REB).

86 IDPs			
Gender	Male: 49	Female: 37	
Age	Min: 15	Max: 63	Average: 33
	SD: 12.6		
Family size	Min: 2	Max: 19	Average: 7
	SD: 3.3		
Children:	Yes: 63	No: 23	
Education	None: 6		
	Primary school: 39		
	Middle School: 21		
	High school: 12		
	Diploma: 3	Bachelor: 3	Master: 1
	Not indicated: 1		
Employed	Yes: 8	No: 78	
47 Refugees			
Gender	Male: 24	Female: 23	
Age	Min: 19	Max: 60	Average: 37
	SD: 10.8		
Family size	Min: 2	Max: 12	Average: 6
	SD: 2.1		
Children:	Yes: 35	No: 12	
Education	None: 3		
	Primary school: 10		
	Middle School: 8		
	High school: 13		
	Diploma: 3	Bachelor: 7	Master: 1
	Not indicated: 2		
Employed	Yes: 19	No: 28	

Table 1. Summary of participants' demographic characteristics

5   USE OF DIGITAL TOOLS

In this section, we use our survey to describe IDPs' and refugees' access to ICTs and usage patterns.

5.1 ICTs Access

When it comes to ICTs access among the two groups, IDPs are not better than refugees. In the cases where one group is better than the other one, IDPs are almost always at a disadvantage.

5.1.1   Digital Devices

74% of the IDPs and 64% of the refugee took no digital device with them when they ran away from their homes. The rest indicates that their phones were the only ICTs they held onto when they escaped.
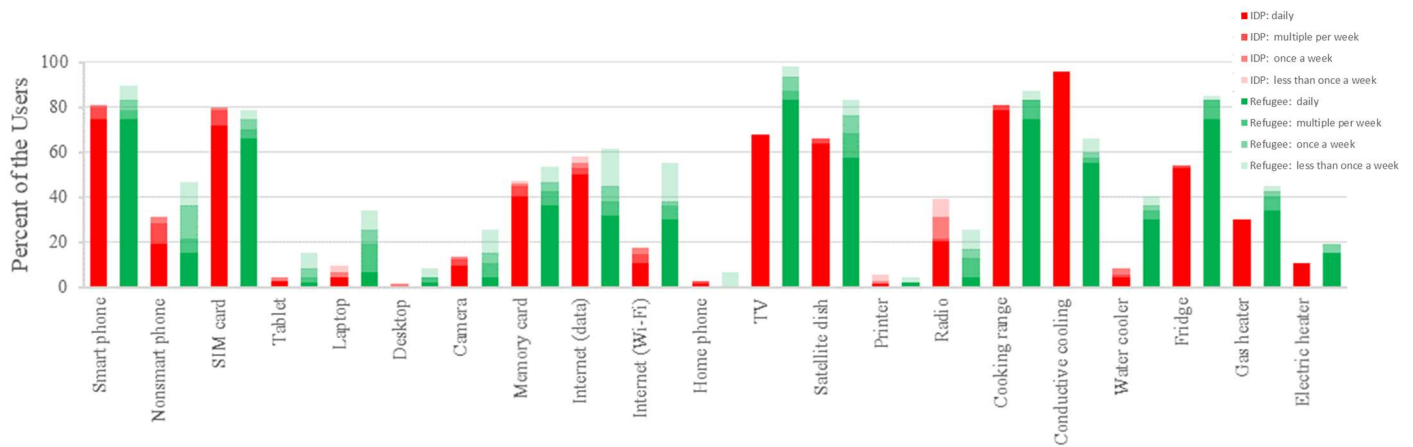

Figure 3: ICT and electronic Device usage pattern

Mobile phones are ultimately the most utilized digital device. At the time of the survey, and among our sample, smart mobile phone, not-smart mobile phone, and SIM card penetration rates are 70%, 27%, and 69% respectively among IDPs, and 87%, 47%, and 79% respectively among refugees as shown in Figure 3. 22% of our female IDPs do not own a phone compared to only 4% of our female refugees. SIM card penetration among women IDPs is at 54% while 87% of our women refugees have a SIM card. SIM card penetration rates in our camps rate are below its national level (96%) [51] because a fair number of our sample had to obtain new phones and SIM cards after they fled. 33% of our IDPs and 40% of our refugees share their phones with other people, mostly with their spouses and other family members but over 80% of our sample from both groups do not share their SIM cards.

The use of other digital devices is limited by both groups generally, but it is very scarce with IDPs as shown in Figure 3. Tablets, laptops, and desktops are used by 3%, 8%, and 1% respectively of our IDP participants, while they are utilized by 15%, 34%, and 9% respectively by our refugee sample. Most of our participants indicate that the quality of these devices is either good or acceptable except around fifth participants in both groups said that the quality of non-smart devices is bad.

5.1.2 Internet

We find that mobile phones on cellular networks are the most common Internet access mode. 44% of our IDPs and 51% of our refugees report that they connect to the Internet via their phone data plan while 12% of our IDP participants and 47% of our refugee participants can connect to the Internet via Wi-Fi. Wi-Fi access is limited in the camps in general because its underlying infrastructure is only available at the local NGO administration offices. To go online using this mode, the Wi-Fi connection is made open once or twice a week at a local NGO center where camps residents would go around the office to catch a signal. Our female IDPs access to the Internet is lower as only 35% of them access the Internet via a data connection while only 5% have access to Wi-Fi. Our female refugees have better percentages where 56% access the Internet via their mobile network, and a similar percentage have Wi-Fi access. In a matter of fact, over half of our female IDPs (compared to 34% of the total IDP participants) have no mode of an Internet connection while only 9% of female refugees (compared to 19% of our total refugee participants) lack Internet access. In summary, the vast majority in both groups get their access via their cellphone data plan. These internet connection modes are similar to what has been

reported at Za'atari refugee camps in Jordan [97, 99]. This implies that the diversity of Internet access modes is reduced, with mobile becoming critical, as people are displaced internally or externally.

5.1.3 Cost

93% of our participants in both groups indicate that the main reasons that prevent them from owning or using ICT devices are the cost of the digital device and the cost of using and maintaining the device, such as the recharging cards and repair expenses. 22% of our IDPs and 34% of our refugees state that the existence of unreliable infrastructure, especially network coverage and electricity, limit their ICT usage. Because mobile phones are the most common ICT device in our camps, our IDPs sample spend between IQD 0 - IQD 120,000 with an average of IQD 23,000 on their devices per month while our refugees spend a bit more between IQD 500 - IQD 130,000 with an average of QD 42,000.

With limited financial resources, the population from both groups have inadequate access to ICT infrastructure. Instead, as our data illustrates in Figure 3, our participants focus on obtaining electrical devices needed for their everyday lives, namely: TV, satellite dish, cooking range, and fridge. Overall, the quality of these devices is described as either good or acceptable by our participants. Interestingly, owning a TV and a satellite dish is deemed a necessity for them. This is due to many of them considering this duo as their window to the outside world [74]. In the Middle East region in general, people stream channels through satellite dishes and not cables. Hundreds of popular local and middle eastern channels are available through this low budget tool [79]. Among both groups, the percentage of our refugees' use of various electrical devices usually doubles that of our IDPs. This can partially be attributed to the fact that refugees have been in camps a bit longer.

5.2 ICT Usage
5.2.1 Skills

Over 62% of both of our IDPs and refugees report that they have medium processionary in using digital devices. Only 4% of IDPs and 16% of refugees say that they were professional users when it comes to such devices. The processionary level is self-proclaimed. From our field notes, we assume that a professional user is an individual who is comfortable in downloading, managing, and using different types of applications on mobile devices and/or other ICTs. Medium processionary refers to the ability to operate mobile devices according to their needs, that is calling, taking pictures and videos, and using Social Media (SM). Beginners are the ones who

can only navigate their devices to make calls.

5.2.2 Communication Behavior
Separated from families and friends and with having more spare time in the camp, communication, information seeking and building or reinforcing social networks are prominent. In order to understand communication behaviors when contacting friends and relatives, we asked which kinds of communication services they use and what for. Our data shows that 88% of our IDPs make local calls, 87% use text messaging, while only 11% make international ones. When it comes to our refugees, 98% of them make local calls, 93% use text messaging while, as expected, 58% make international calls. The vast majority in both groups believe that ICTs are useful for connecting with other people, especially family and friends. Only very few participants from our entire sample, and from our field notes, use ICTs to gain information, such as to read the news or utilize educational programs. Most of our participants in both groups use their phones to record videos, take photos and share them with family and friends through SM platforms. Almost half of our IDPs use Facebook, while Viber, Instagram, and WhatsApp usage rates come next. 38% of our refugees, on the other hand, prefer to use WhatsApp while Facebook, Viber, and Instagram are used by fewer people in this group. This high penetration of SM usage for social purposes is similar to the finding of other studies conducted in refugees camps and with resettled refugees in the west [19, 26, 36, 55, 97]. Interestingly, when the Internet is not available, our participants turn to cheaper modes of local digital sharing. Over half of our participants from both groups use Bluetooth to share their videos and pictures, around 20% show the others directly on their phone, while a shy of 10% use memory cards to exchange content. In summary, the cost of ICTs, limitation in the underlying infrastructure, lack of techno-skills, and inadequate access to the Internet can explain why mobile devices in our context are not utilized to their full potentials which go beyond social engagement.

6 GENERAL STRUGGLES
All of the studied camps are under the supervision of the Barzani Charity Foundation (BCF) [11], a local NGO. The BCF works with the government, other local NGOs, and international bodies – such as NRC, DRC, and ERC - to deliver local and international aids and services to the displaced population in need, that being IDPs or refugees. Most of our camp occupants fled due to the ISIS turmoil since 2014 in their areas. In this section, we depend mainly on our field observations to report on camps living conditions.

We noticed that camps dwellers are permitted to leave the camps (though not all of them would be able to visit large cities due to these areas being surrounded by security checkpoints that require special IDs to enter). Unlike refugee camps in neighboring countries [90], refugees in Iraq are free to leave and enter the camps and have residency visas that permit them to work. Our survey supports this observation because almost all of our participants in both groups leave the camps either once a week or once a month to, mainly, see a doctor or purchase goods which are not available in the camps. IDPs and refugees show a good level of resilience and a great desire to improve their situation by welcoming camps guests, supporting their neighbors, customizing their homes, starting local businesses, and sending their kids to the school when possible.

6.1 Architecture
At the time of our camp visit in October, the weather was spring-like. Camps had ongoing house construction work, and water and electricity were available to some extent (i.e., generators existed, but cut-off happened which is very common in the country). Most

Figure 4: Puddle of water at Baharka

of the construction and wiring was carried out by international NGOs. The refugee camps we visited, especially Darashakran camp, looked more like a small town rather than a camp. There were rainwater gutters, elevated concrete shelters, organized electricity wires, and fenced houses. In all the camps, there was a construction movement to replace the tents with concrete cores where international NGOs, in collaboration with the government, would build one 7x4.4 m room for families in extreme need. The rest was to be built as more resources become available. However, the two IDP camps had less sophisticated cores and most of the structures were still tents because construction started much more recently compared to the refugee camps. This can be due to refugee camps being a year older than the IDP ones. The NGOs construction had proper foundations (with metal) so the houses can support a second floor. Structures that were built by the displaced did not have this feature. Some people lived in caravans that were donated by neighboring countries. However, some IDP residents experienced erosion of the wood floors in their caravans which insects crept in from. This was due to water gathering under and around caravans. Loose water could rust the caravans, and we saw that children tended to play barefoot with this - usually polluted - water (Figure 4). To fix this problem, the residents had to report it in-person to someone at the on-site NGO office to fix it. However, repairs did not always happen as resources were limited for construction. All of the built structures were marked with a "selling and buying this residence is considered an illegal action" sign.

6.2 Economy
The pervasive problem among both groups was poverty and hunger. However, camp dwellers offered beverages and sometimes even food for us when we visited. This was due to their culture of hospitality towards guests despite the hard conditions. While in both groups a large number of women acted as the primary breadwinners for their families, IDPs seemed to have more percentages of such women because more were widows, had imprisoned husband, or lost all the male member of their families in the conflicts. Moreover, IDPs tended to have less education than refugees in the camps we visited. We observed that IDPs were more impoverished, or at least acted poorer, than refugees. This was evident by the number of children and women who approached and talked with us in the hope of receiving money or food or delivering their concerns to the camps' officials. They were not begging (at least not by the typical sense). Moreover, we noticed that IDPs had more family issues than refugees especially in terms of the number of dependents and disability, and more social problems such as harassment and theft. The poorer state of our IDPs could explain

Figure 5: Local shops at [top] Baharka, Debaga, [bottom] Darashakran, and Kawergosk

Figure 6: Workshop room at a local NGO office in Baharka

why most of our internally displaced survey sample had less access to ICTs and electrical devices compared to refugees.

The IDPs poor state can be linked to the fact that Iraq has been suffering from conflicts and sanctions over the past 39 years [40]. The poorer status of IDPs compare to refugees can be attributed to the difference in movement dynamics between the two groups. When a crisis happens in an area where the only solution to survive is to flee, an escaping individual must determine the surviving probability associated with remaining inside their own country or crossing a border [13]. There are several factors that inform such a decision. The most relevant to our context are safety, transport, and financial resources. In terms of safety, if violence level is higher in neighboring countries than in the origin country, becoming internally displaced makes more sense [67]. When it comes to transport, the displaced population flee to a safe place that is reachable. Inaccessible places due to terrain or active conflicts are not preferred [4]. Lastly, people with enough financial resources can issue travel documents, enter legally into another country and reside there. In some cases, financial resources exist but traveling to another country is not possible due to lack of proper documents. If a safe place is present within borders and is reachable, then relocating to local cities is an appropriate option. A population that lacks sufficient funds or have some but cannot reach a safe place within their country would end up in camps [5, 85]. In our context, our IDPs lived close to the Syrian borders but cross-border areas were under the control of the same terrorist group they fled from so seeking refuge inside their home country was the ideal solution. People who had some financial assets were able to move to other cities and the ones who did not are placed in camps. Some of our refugees may have had some financial resources and safe areas in Syria existed but because these areas were not reachable, crossing the borders to Iraq was a safer decision.

6.3 Employment

Working opportunities for our displaced population was limited in general. Stable employment usually came in the form of running a local business (Figure 5) or working at the local NGOs office. There was a cultural difference in terms of men work practices between our IDPs and refugees. Most of our male IDPs worked at off-camp locations while male refugees ran their businesses inside the camps. We cannot confirm the factors behind such variance, but we speculate that it is due to the difference in the culture of self-employment vs. being employed by someone else between the residents of the two countries. Hence, IDPs expressed their concern about their inability to access large cities (due to the transportation costs or security checkpoints) which caused them to lose their jobs. Refugees hardly complained about this because they needed to

leave the camps less. Both parties expressed their appreciation for in-camp employment and business opportunities. None of the displaced people we met had an online-job or looked for work opportunities online. This was due to their limited techno-skills and the fact that lifestyle in that region does not rely on technology use to access services and information as the western countries do [8].

Most of the working women we met in all the camps had gender-based occupations such as a hairdresser, a cook, a cloth maker, or a teacher. They would work inside and outside the camps. Communication with potential clients, especially off-camp ones, was done via normal calls, texts, or social media. To support them, NGOs active in the camps hired only displaced women for certain jobs at their local facilities. Moreover, they ran a lot more female-targeted workshops such as makeup, hairdressing, knitting, and sewing compared to male-specific ones (Figure 6). In some cases, families led by women were at a better financial state because the women had more opportunities to work in the form of domestic physical labor such as cooking, knitting, and cleaning.

6.4 Healthcare

All camps were required to have a clinic on site; some were run by the Iraqi Ministry of Health while others by international organizations. However, healthcare services were limited in all the camps in general but were very scarce in the IDP camps. For example, the ERC ran a local basic clinic twice a week at the Baharka IDP camp and spent the rest of the working week at the Debaga IDP camp which was receiving a new influx of IDPs at the time. This meant that health aides were not always available when needed. In all camps, clinics were very crowded due to the shortage of staff. There was a severe drug shortage. Moreover, healthcare assistant beyond the basic general physician visit was limited. For advance health care, a physician at the camp would write referral reports by hand and mail them to the public hospitals and clinics in the large cities. The displaced needed to wait their turn, which can take many months, to visit proper healthcare centers to get proper examination and treatment. If the displaced had some financial resources, they would visit an off-camp private doctor. However, because of poverty, most of them waited their turn for public treatment. Tele-medicine was not utilized due to the scarce technology usage in general for service purposes at this region [8].

6.5 Education

In terms of access to education, all the camps had schools up to grade 9. We did not go inside the schools; however, we were told that the ratio of teacher to students was very low, the number of students in a given class was high, and there was a lack in school supplies, such as textbooks. While education was not up to par in all the camps, it was particularly disastrous in the IDP camps. At

the time of our visit, in the Debaga IDP camps, classes in the camp school were ceased for more than four months at the time due to the massive influx of new camp arrivals. Women and children were housed in the school while the men stayed in the mosque. Some had lived in the school for over 4 months awaiting tents. In the same camp, UNICEF had a kindergarten. It had four large tents, with a Mobareda (a very basic swamp cooler) in each one. Children voices were very loud and enthusiastic as they participated in the activities running simultaneously in each tent. In one, they sat down to watch a cartoon on a TV owned by an NGO. In a second tent, they sat in a large circle and repeated the alphabet after the staff (who is a camp resident). In a third, they played games. In the last tent, they colored and did arts and crafts. The number of children was higher than usual, and some kids were 7-8 years old because those who stopped going to school due to conflict and displacement were now coming back. We noticed no use of educational technology by the displaced population. Besides the unreliable Internet access to utilize such technology, many mothers noted that their children expressed no interest in going to school or even watching education videos online due to the trauma the little ones witnessed from being inside a war zone and on the escape route. Some families were able to hire private tutors (from the camp) to teach their children. However, many families could not afford this and some children did not respond to personal teachers since these tutors had little experience in working with distressed populations.

6.6 Beyond the Camp
Our survey shows that about a quarter of our refugees want to go back to their home country while the majority of the rest want to immigrate. About a quarter of the IDPs wants to go back to their homes while a quarter prefers to stay in the camp because they 'feel safer' or they have no place to go back to because their homes were destroyed. The rest expressed their interest in immigrating or settling in nearby countries. Since our survey, these percentages have been going up. A recent report by the REACH which surveyed thousands of IDP households in Iraq finds that over half of them do not plan on returning to their area of origin and the ultimate majority of the current IDPs who plan on not returning wants to stay and integrate at the current area of displacement [106]. Within the Erbil Governorate, where all of our camps are located, only 2% of IDP households report intentions to return to their original homes [101]. While many in the survey indicate that going home may offer them opportunities to work in the public sector that they cannot do in the camps, the main reasons cited for not wanting to go back were safety (fear of hazard materials and shortage of police force), lack of services, poor infrastructure, and homes damaged beyond repair.

Unfortunately, current regulations and field reports tell a different story. According to the UN guiding principles, durable solutions are achieved for IDPs when they "no longer have any specific assistance and protection needs that are linked to their displacement and can enjoy their human rights without discrimination on account of their displacement [71]." Over the past year, the number of people returning to the areas from which they had fled surpass the number of those displaced by the conflict for the first time in years in Iraq [100]. This is due to many terrorist captive cities that IDPs fled from being freed [107]. Behind these figures, however, lies a complex narrative that speaks about the struggles families face as they seek out sustainable solutions to their displacement. According to the reports by multiple international NGOs [66, 78, 85, 107] that have been actively working with IDPs in Iraq, most of these returns are premature, i.e. they do not meet international standards of safety and dignity, and many are not voluntary. Poor conditions in camps, limited aids, and restrictions on freedom of movement prompt some

displaced families to leave camps prematurely despite the risks. Others are not allowed to choose; they have been evicted or coerced to return against their well. Some have been blocked from returning (due to complex security reasons) or evicted and displaced once more when they finally return to their areas of origin. While we do acknowledge the hardship imposed on refugees, they are not subject to those compulsory actions because they are protected under international laws.

7 DISCUSSION
The observations from the fieldwork and survey data presented in this paper offer an inside look into the living conditions of IDPs in camps and provide a basis for exploring the role ICT may play in empowering displaced people through addressing their needs. Our findings are based on our context. It is possible that IDPs at different locations may have different experiences. The results we report, nevertheless, can be representative of the issues the conflict-driven internally displaced people in scarce environment suffer from, and point us to important design implications and future work that can advance research in this field.

Although camps tend to be occupied for years because most displacement crises persist protractedly with little or no prospect of achieving durable solutions, such as safe returns or resettlement elsewhere, they are still seen as temporary settlements [21]. This explains why education, employment, and healthcare infrastructure are scarce across them. While some buildings become permanent, as our data has revealed and as evident by other studies [34, 44, 77], their occupants are still considered transients especially since IDPs can be evicted from the camps and forced into premature returns and/or second displacement. These challenges could not be solved easily by reference to conventional ICT usage. Since computing schemes - such as electricity supply, network, or maintenance – are neither readily available nor constantly reliable in many camp situations like ours, we are cognizant of the limits that IDPs face. Despite the hardships, however, our IDPs show resilience in terms of wanting to support themselves financially and send their children to school. Therefore, we suggest that it is crucial to consider designing new technologies responsive to both local limits and local demands. We believe that ICTs can mitigate this tension between camp regulations and the needs of the displaced by providing the virtual services that can be accessed on or off the camps such as e-employment, telemedicine, and online education. However, as we have shown, access to ICTs, except mobile phones, for a long period of time is difficult. Moreover, our IDPs' skills in using digital devices are limited mainly to social media platforms. As a result, research associated with service delivery in a limited-resource environment needs to address these challenges.

7.1 Design Implications
Given the scale and diversity of the problem, a "one-size-fits-all" approach to design is unlikely to work because, depending on where IDPs reside, each context presents its own unique challenges. This is also true given the situational differences between refugees and IDPs. We believe that computing-related solutions could augment conventional solutions from the political, economy, and social science fields and offer new ways to approach some of the problems IDPs struggle with. We present our suggestions for providing better employment opportunities, healthcare, and education.

Because the majority of our IDPs do not have access to large cities, working opportunities become limited. Crowdworking can open the door to new employment opportunities. In this system, work is outsourced through an open call to a certain group of people and job

allocation is based on availability and/or geographical location to perform local, service-oriented tasks such as driving, running errands or cleaning houses [45]. There are many applications that support this system [10, 25, 84]. However, due to the limited techno-skills of our IDPs and inadequate Internet access, these applications cannot be utilized by our population. We propose utilizing platforms our IDPs are familiar with, such as social media, to connect service acquirers from nearby areas with potential workers from our camps. Internet access would only be needed when collecting orders or updating order status. Moreover, if we are to deploy such a system, we need to focus on supporting domestic tasks commonly practices in our camps such as cooking and tailoring. We can also support communal working opportunities. For example, a person from the camp delivers multiple orders from multiple IDPs to the clients. This addresses the movement restrictions and helps IDPs who have been displaced more than once to continue making orders without worrying about delivery.

We are cognizant of several design initiatives that promote positive health outcomes to refugees, such as mHealth applications [28]. However, given the fact that both connectivity coverage and device ownership is dramatically low in our camps, and because external involvement is restricted, we privilege community-oriented solutions over individual-oriented ones. We believe that Digital Storytelling (DST) can be a powerful health communication tool to the displaced communities in term of disseminating information about health care, diagnoses, and intervention in the absence of healthcare provider. DST is a form of expression where users produce a digital memoir by combining their narratives with technology. As a tool for health communication, it honors community knowledge and experience [23] and can strengthen personal capacity by allowing new forms of social networking [61], support shared values and self-advocacy [17], and develop literacy and language skills [30]. Drawing from existing participatory design, DST, and digital health research with refugees [27, 59, 70], DST workshops could be organized with IDPs in camps, at the local NGO office where Wi-Fi is available for example, to enable co-learning process and reinforce health outcomes.

To make education accessible and effective in our context, we need to address the issues of shortage in teachers and school supplies. To enhance the current schools in camps, we suggest we learn from the strength of remote learning offered by several ICT researchers in the context of elderly [86] and remote population [72, 75] where live visualization and streaming between the teachers and learners are used. In case a student cannot attend the school due to overcrowded classrooms or displacement, we can draw from the concept of homeschooling [38], and offline-only and hybrid system architectures in ICTD [16] to utilize mobile phone and make the entire school curriculum available online and downloadable. However, it is hard to design a remote education system for IDPs for two reasons: (1) such a system requires a native teacher - because IDP camps are under local state jurisdiction - who is familiar with the local culture and who understands the potential trauma some students may be struggling with, and (2) it is crucial to develop an IDP-oriented curriculum that not only aligns with their values but is also useful for them to acquire jobs available in their environment. Current remote-learning technologies do not address these problems. Hence, similar to [20, 54] work about improving classroom learning, we propose holding participatory design workshops with IDPs and the stakeholders who would provide the educational platform (usually the local state) to better understand the needs and the expectations of our end-users.

Finally, we believe that creating grassroots level collaboration between the refugees and the IDPs may be beneficial. Currently, the two parties are seen as separate entities but, in reality, they are closely related. Hence, such an alliance can support solidarity through exchanging strategies to develop resilience to the stressful living conditions [47, 68]. Similar to citizen coordination of aids for post-disaster victims [73] and community organizations effort to develop an international network of support [42], ICT can develop such a relationship between IDPs and refugees through SM.

7.2 Policy Recommendations

Because of the continuing political unrest in the world and the rise of natural disasters, an increasing number of IDPs are being exiled within their own national boundaries. Since international laws often cannot directly act to protect the human rights of these IDPs, national laws should pay more attention to them. However, because of the lack of a proper people-centered functioning government, IDPs in the Global South often find themselves imprisoned and marginalized. Moreover, global experience shows that short term humanitarian assistance for the displaced cannot fully mitigate the risk of vulnerability and marginalization associated with the displacement. Too often a humanitarian response for the displaced contributes to their dependency and lack of self-reliance. IDPs eventual need for safety nets and further support can drain governments for years [89]. Hence, countries require a holistic approach to protect them, which can only be ensured if there is a mass-awareness among the local people, and channels for international diplomatic pressure are created upon the government to implement a protective policy for the IDPs.

We argue that computing technologies can play an important role to introduce, maintain, and implement laws for helping the IDPs. Social media can play an important role to create mass-awareness in a country and persuade the government to follow the necessary steps. Through citizen journalism, a regular citizen can report if those laws are practiced in society. Moreover, we can connect local people to many international organizations so that there can be an international force to persuade the government to make necessary policies for the IDPs. Furthermore, technology can facilitate dialogues for integrating the displaced into national and local development frameworks. IDPs are, to some extent, locals. This implies that they should have the freedom to work or own businesses and property without extraordinary discrimination such as being forced to be evicted. In a matter of fact, with some support, they could achieve economic integration and the ability to invest in the future which can be beneficial for the local communities near the camps. ICTs can play an important role in finding discrepancies in the labor market and help design corrective policies.

8 CONCLUSION

IDPs are rarely discussed in ICT research. In this paper, we report our findings in relation to the displaced people' living conditions and their ICTs usage from our field notes of visiting several conflict-induced IDP and refugee camps in northern Iraq, and surveys conducted with both displaced population groups. Our work shows that financial resources, healthcare, and education are scarce among the displaced. Mobile phones, internet through data plan, TVs, and satellite dish are the most common, and almost the only available, ICTs. We discuss how our IDPs conditions are similar to or, in some cases, worse than our refugees. We focus on key issues with a vision of making ICTs initiatives more inclusive for IDPs. Future work should address the lack of IDPs presence in research and must aim to include them in technology policies and design.

ACKNOWLEDGMENT

REFERENCES

[1] Aal, K., Mouratidis, M., Weibert, A. and Wulf, V. 2016. Challenges of CI Initiatives in a Political Unstable Situation - Case Study of a Computer Club in a Refugee Camp. *Proceedings of the 19th International Conference on Supporting Group Work - GROUP '16* (Sanibel Island, Florida, USA, 2016), 409–412.

[2] Aal, K., von Rekowski, T., Yerousis, G., Wulf, V. and Weibert, A. 2015. Bridging (Gender-Related) Barriers: A comparative study of intercultural computer clubs. *Proceedings of the Third Conference on GenderIT - GenderIT '15* (Philadelphia, PA, USA, 2015), 17–23.

[3] Aal, K., Yerousis, G., Schubert, K., Hornung, D., Stickel, O. and Wulf, V. 2014. Come_in@palestine: adapting a german computer club concept to a palestinian refugee camp. *Proceedings of the 5th ACM international conference on Collaboration across boundaries: culture, distance & technology - CABS '14* (Kyoto, Japan, 2014), 111–120.

[4] Adhikari, P. 2013. Conflict-Induced Displacement, Understanding the Causes of Flight. *American Journal of Political Science.* 57, 1 (2013), 82–89. DOI:https://doi.org/10.1111/j.1540-5907.2012.00598.x.

[5] Adhikari, P. 2012. The Plight of the Forgotten Ones: Civil War and Forced Migration. *International Studies Quarterly.* 56, 3 (2012), 590–606.

[6] Ahmed, S.I., Mim, N.J. and Jackson, S.J. 2015. Residual Mobilities: Infrastructural Displacement and Post-Colonial Computing in Bangladesh. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (New York, NY, USA, 2015), 437–446.

[7] Akume, A.T. 2015. The Question of Internally Displaced Persons (IDPS) in Nigeria: A Reflection on Present Realities. *Journal of Third World Studies.* 32, 1 (2015), 221–244.

[8] Al-Sammarraie, M.K.F., Faieq, A.K. and Al-Qasa, K. 2016. An instrument design to measure the sustainability of technology in risky environments: Case study of Iraq. *AIP Conference Proceedings.* 1761, 1 (Aug. 2016), 020017. DOI:https://doi.org/10.1063/1.4960857.

[9] Alvarado, S.E. and Massey, D.S. 2010. Search of Peace: Structural Adjustment, Violence, and International Migration. *The ANNALS of the American Academy of Political and Social Science.* 630, 1 (Jul. 2010), 137–161. DOI:https://doi.org/10.1177/0002716210368107.

[10] Amazon Mechanical Turk: *https://www.mturk.com/.* Accessed: 2019-02-22.

[11] Barzani Charity Foundation: *http://www.bcf.krd/english/.* Accessed: 2019-02-03.

[12] Bohnet, H., Cottier, F. and Hug, S. 2018. Conflict-induced IDPs and the Spread of Conflict. *Journal of Conflict Resolution.* 62, 4 (2018), 691–716. DOI:https://doi.org/10.1177/0022002716665209.

[13] Bohra-Mishra, P. and Massey, D. 2011. Individual Decisions to Migrate During Civil Conflict. *Demography.* 48, 2 (2011), 401–424. DOI:https://doi.org/10.1007/s13524-011-0016-5.

[14] Bowker, G.C. and Star, S.L. 1999. *Sorting things out: classification and its consequences.* MIT Press.

[15] Cardona-Fox, G. 2015. *Exile within borders: a study of complinace with the international regime to protect internally Displaced persons.* The University of Texas at Austin.

[16] Chen, J. 2015. Computing within limits and ICTD. *First Monday.* 20, 8 (Jul. 2015). DOI:https://doi.org/10.5210/fm.v20i8.6124.

[17] Clarke, R., Wright, P. and McCarthy, J. 2012. Sharing narrative and experience: digital stories and portraits at a women's centre. *Proceedings of the 2012 ACM annual conference extended abstracts on Human Factors in Computing Systems Extended Abstracts - CHI EA '12* (Austin, Texas, USA, 2012), 1505.

[18] Cohen, R. and Deng, F.M. eds. 1998. *The forsaken people: case studies of the internally displaced.* Brookings Institution Press.

[19] Coles-Kemp, L., Jensen, R.B. and Talhouk, R. 2018. In a New Land: Mobile Phones, Amplified Pressures and Reduced Capabilities. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (New York, NY, USA, 2018), 584:1–584:13.

[20] Cramer, M. and Hayes, G.R. 2013. The digital economy: a case study of designing for classrooms. *Proceedings of the 12th International Conference on Interaction Design and Children - IDC '13* (New York, New York, 2013), 431–434.

[21] Crawford, N., Cosgrave, J., Haysom, S. and Walicki, N. 2015. *Protracted displacement: uncertain paths to self-reliance in exile.* https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9851.pdf.

[22] Cresswell, T. 2010. Towards a Politics of Mobility. *Environment and Planning D: Society and Space.* 28, 1 (Feb. 2010), 17–31. DOI:https://doi.org/10.1068/d11407.

[23] Cueva, M., Kuhnley, R., Revels, L., Schoenberg, N.E. and Dignan, M. 2015. Digital storytelling: a tool for health promotion and cancer awareness in rural Alaskan communities. *International Journal of Circumpolar Health.* 74, 1 (Jan. 2015), 28781. DOI:https://doi.org/10.3402/ijch.v74.28781.

[24] Darashakran Camp profile, Syrian Refugees, Erbil, Iraq - Iraq: *https://reliefweb.int/report/iraq/darashakran-camp-profile-syrian-refugees-erbil-iraq.* Accessed: 2019-02-05.

[25] Data Powered By Crowd Intelligence fast, accurate, global: *https://www.clickworker.com/.* Accessed: 2019-02-22.

[26] Dekker, R., Engbersen, G., Klaver, J. and Vonk, H. 2018. Smart Refugees: How Syrian Asylum Migrants Use Social Media Information in Migration Decision-Making. *Social Media + Society.* 4, 1 (Jan. 2018), 205630511876443. DOI:https://doi.org/10.1177/2056305118764439.

[27] DiFulvio, G.T., Gubrium, A.C., Fiddian-Green, A., Lowe, S.E. and Del Toro-Mejias, L.M. 2016. Digital Storytelling as a Narrative Health Promotion Process: Evaluation of a Pilot Study. *International Quarterly of Community Health Education.* 36, 3 (Apr. 2016), 157–164. DOI:https://doi.org/10.1177/0272684X16647359.

[28] Doocy, S., Lyles, E., Fahed, Z., Mkanna, A., Kontunen, K. and Burnham, G. 2018. Characteristics of Syrian and Lebanese Diabetes and Hypertension Patients in Lebanon. *The Open Hypertension Journal.* 10, 1 (Dec. 2018), 60–75. DOI:https://doi.org/10.2174/1876526201810010060.

[29] Elliott, A., Urry, J. and Urry, J. 2010. *Mobile Lives.* Routledge.

[30] Emert, T. 2014. Interactive Digital Storytelling with Refugee Children. *Language Arts.* 91, 6 (2014), 401–415.

[31] Fagen, P.W. 2009. Peace Processes and IDP Solutions. *Refugee Survey Quarterly*. 28, 1 (2009), 31–58. DOI:https://doi.org/10.1093/rsq/hdp004.

[32] Ferris, E., Mooney, E. and Stark, C. 2011. *From Responsibility to Response: Assessing National Approaches to Internal Displacement*. The Brookings Institution – London School of Economics Project on Internal Displacement. https://www.brookings.edu/wp-content/uploads/2016/06/From-Responsibility-to-Response-Nov-2011.pdf. Accessed: 2019-01-27.

[33] Figures at a Glance: 2018. https://www.unhcr.org/figures-at-a-glance.html. Accessed: 2018-11-27.

[34] Fincham, K. 2012. Learning the nation in exile: constructing youth identities, belonging and 'citizenship' in Palestinian refugee camps in south Lebanon. *Comparative Education*. 48, 1 (Feb. 2012), 119–133. DOI:https://doi.org/10.1080/03050068.2011.637767.

[35] Fisher, K.E., Talhouk, R., Yefimova, K., Al-Shahrabi, D., Yafi, E., Ewald, S. and Comber, R. 2017. Za'atari Refugee Cookbook: Relevance, Challenges and Design Considerations. *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '17* (Denver, Colorado, USA, 2017), 2576–2583.

[36] Fisher, K.E. and Yafi, E. 2018. Syrian Youth in Za'atari Refugee Camp as ICT Wayfarers: An Exploratory Study Using LEGO and Storytelling. *Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies (COMPASS) - COMPASS '18* (Menlo Park and San Jose, CA, USA, 2018), 1–12.

[37] Fisher, K.E., Yefimova, K. and Yafi, E. 2016. Future's Butterflies: Co-Designing ICT Wayfaring Technology with Refugee Syrian Youth. *Proceedings of the The 15th International Conference on Interaction Design and Children - IDC '16* (Manchester, United Kingdom, 2016), 25–36.

[38] Franky, A.P. and Chiappe, A. 2018. ICT and home-educating families: a qualitative multiple case study. *Ensaio: Avaliação e Políticas Públicas em Educação*. 26, 101 (Dec. 2018), 1324–1346. DOI:https://doi.org/10.1590/s0104-40362018002601507.

[39] Glaser, B.G. and Strauss, A.L. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine.

[40] Golenberg, E.M. ed. 2010. *Iraq: forward, backward or nowhere?*. Nova Science Publishers.

[41] Goodwin-Gill, G.S. 2014. The International Law of Refugee Protection. *The Oxford Handbook of Refugee and Forced Migration Studies*. (Jun. 2014). DOI:https://doi.org/10.1093/oxfordhb/9780199652433.013.0021.

[42] Gryc, W. 2009. The social and communication networks of a grassroots organization in Kibera, Kenya. *Proceeding of the 2009 international workshop on Intercultural collaboration - IWIC '09* (Palo Alto, California, USA, 2009), 23.

[43] Hampton, B. 2002. *Internally displaced people: a global survey*. Earthscan.

[44] Hart, J., Paszkiewicz, N. and Albadra, D. 2018. Shelter as Home?: Syrian Homemaking in Jordanian Refugee Camps. *Human Organization*. 77, 4 (Dec. 2018), 371–380. DOI:https://doi.org/10.17730/0018-7259.77.4.371.

[45] Howcroft, D. and Bergvall-Kåreborn, B. 2019. A Typology of Crowdwork Platforms. *Work, Employment and Society*. 33, 1 (Feb. 2019), 21–38. DOI:https://doi.org/10.1177/0950017018760136.

[46] Ibáñez, A.M. and Vélez, C.E. 2008. Civil Conflict and Forced Migration: The Micro Determinants and Welfare Losses of Displacement in Colombia. *World Development*. 36, 4 (Apr. 2008), 659–676. DOI:https://doi.org/10.1016/j.worlddev.2007.04.013.

[47] Ibrahim, S. 2017. How to Build Collective Capabilities: The 3C-Model for Grassroots-Led Development. *Journal of Human Development and Capabilities*. 18, 2 (2017), 197–222. DOI:https://doi.org/10.1080/19452829.2016.1270918.

[48] IDMC *Global Report on Internal Displacement (GRID) 2018*. http://www.internal-displacement.org/global-report/grid2018/downloads/2018-GRID.pdf. Accessed: 2019-01-27.

[49] IDMC: About us: 2019. http://www.internal-displacement.org/about-us. Accessed: 2019-02-03.

[50] Iraq: 2018. http://www.internal-displacement.org/countries/iraq. Accessed: 2019-01-29.

[51] Iraq Data Dashboard: https://www.gsmaintelligence.com/markets/1666/dashboard/. Accessed: 2019-02-05.

[52] Iraqi Refugee Crisis: Support Iraq Emergency Relief: https://www.unrefugees.org/emergencies/iraq/. Accessed: 2019-02-03.

[53] Iraqi Refugee Processing Fact Sheet: 2013. https://www.uscis.gov/humanitarian/refugees-asylum/refugees/iraqi-refugee-processing-fact-sheet. Accessed: 2019-02-03.

[54] Itenge-Wheeler, H., Kuure, E., Brereton, M. and Winschiers-Theophilus, H. 2016. Co-creating an enabling reading environment for and with Namibian children. *Proceedings of the 14th Participatory Design Conference on Full papers - PDC '16* (Aarhus, Denmark, 2016), 131–140.

[55] Kaufmann, K. 2018. Navigating a new life: Syrian refugees and their smartphones in Vienna. *Information, Communication & Society*. 21, 6 (2018), 882–898. DOI:https://doi.org/10.1080/1369118X.2018.1437205.

[56] Kawergosk Camp profile, Syrian Refugees, Erbil, Iraq - Iraq: https://reliefweb.int/report/iraq/kawergosk-camp-profile-syrian-refugees-erbil-iraq. Accessed: 2019-02-05.

[57] Kemp, R.B. 2011. Classifying marginalized people, focusing on natural disaster survivors. *NASKO*. 1, 1 (Nov. 2011). DOI:https://doi.org/10.7152/nasko.v1i1.12833.

[58] Kemper, T. and Heinzel, J. 2014. Mapping and Monitoring of Refugees and Internally Displaced People Using EO Data. *Global Urban Monitoring and Assessment through Earth Observation*. Q. Weng, ed. CRC Press. 195–216.

[59] Lenette, C. and Boddy, J. 2013. Visual ethnography and refugee women: nuanced understandings of lived experiences. *Qualitative Research Journal*. 13, 1 (May 2013), 72–89. DOI:https://doi.org/10.1108/14439881311314621.

[60] Lucas, R.E.B. 2016. Internal migration in developing economies: an overview of recent evidence. *Geopolitics, History, and International Relations*. 8, 2 (2016), 159–191.

[61] Lundby, K. ed. 2009. *Digital storytelling, mediatized stories: self-representations in new media*. P. Lang.

[62] Mann, C.L., Gillezeau, C.N., Massazza, A., Lyons, D.J., Tanaka, K., Yonekura, K., Sekine, H., Yanagisawa, R. and Katz, C.L. 2018. Fukushima Triple Disaster and the Road to Recovery: a Qualitative Exploration of Resilience in Internally Displaced Residents. *Psychiatric Quarterly*. 89, 2 (Jun. 2018), 383–397. DOI:https://doi.org/10.1007/s11126-017-9542-7.

[63] Martin, S.F. and Singh, L. 2018. Chapter 9: Data Analytics

and Displacement: Using Big Data to Forecast Mass Movements of People. *Digital Lifeline?: ICTs for Refugees and Displaced Persons*. C. Maitland, ed. MITP. 185–206.

[64] Massey, D. 1992. Politics and Space/Time. *New Left Review*. 196, (1992), 65–84.

[65] Massey, J. 1993. Chapter 4: Power-geometry and progressive sense of place. *Mapping the futures: local cultures, global change*. J. Bird, ed. Routledge.

[66] Montemurro, M. and Wendt, K. 2018. *'Listen to our voices.' What does it take to improve refugee participation in durable solutions processes?* The Danish Refugee Council (DRC) and HERE-Geneva. *https://drc.ngo/media/4736779/participation-and-durable-solutions-guidance-for-crrf_drc-here_july-2018.pdf*. Accessed: 2019-02-08.

[67] Moore, W.H. and Shellman, S.M. 2006. Refugee or Internally Displaced Person?: To Where Should One Flee? *Comparative Political Studies*. 39, 5 (Jun. 2006), 599–622. DOI:https://doi.org/10.1177/0010414005276457.

[68] Morris, J.C., McNamara, M.W. and Belcher, A. 2019. Building Resilience Through Collaboration Between Grassroots Citizen Groups and Governments: Two Case Studies. *Public Works Management & Policy*. 24, 1 (Jan. 2019), 50–62. DOI:https://doi.org/10.1177/1087724X18803116.

[69] Nicholson, F. and Kumin, J. 2017. *A guide to international refugee protection and building state asylum systems*. UNHCR. *https://www.unhcr.org/publications/legal/3d4aba564/refugee-protection-guide-international-refugee-law-handbook-parliamentarians.html*. Accessed: 2019-02-08.

[70] Njeru, J.W., Patten, C.A., Hanza, M.M.K., Brockman, T.A., Ridgeway, J.L., Weis, J.A., Clark, M.M., Goodson, M., Osman, A., Porraz-Capetillo, G., Hared, A., Myers, A., Sia, I.G. and Wieland, M.L. 2015. Stories for change: development of a diabetes digital storytelling intervention for refugees and immigrants to minnesota using qualitative methods. *BMC Public Health*. 15, 1 (Dec. 2015). DOI:https://doi.org/10.1186/s12889-015-2628-y.

[71] Office of the United Nations High Commissioner for Human Rights (OHCHR) 1998. *Guiding Principles on Internal Displacement*.

[72] Øgaard, A. 2018. Conventional classroom teaching through ICT and distance teaching. *Nordic Journal of Digital Literacy*. 13, 01 (Mar. 2018), 9–23. DOI:https://doi.org/10.18261/issn.1891-943x-2018-01-02.

[73] Palen, L. and Liu, S.B. 2007. Citizen communications in crisis: anticipating a future of ICT-supported public participation. *Proceedings of the SIGCHI conference on Human factors in computing systems - CHI '07* (San Jose, California, USA, 2007), 727.

[74] Parks, L. 2012. Technostruggles and the Satellite Dish: A Populist Approach to Infrastructure. *Cultural Technologies: The Shaping of Culture in Media and Society*. B. Bolin, ed.

[75] Pimmer, C., Brysiewicz, P., Linxen, S., Walters, F., Chipps, J. and Gröhbiel, U. 2014. Informal mobile learning in nurse education and practice in remote areas—A case study from rural South Africa. *Nurse Education Today*. 34, 11 (Nov. 2014), 1398–1404. DOI:https://doi.org/10.1016/j.nedt.2014.03.013.

[76] Robehmed, S. 2019. Designing User-Centered Humanitarian Technologies with Displaced People in Iraq: Lessons from Refunite's Mobile Family Tracing Platform. *International Migration*. 57, 2 (2019), 109–120. DOI:https://doi.org/10.1111/imig.12525.

[77] Sabie, S., Chen, J., Abouzied, A., Hashim, F., Kahlon, H. and Easterbrook, S. 2017. Shelter Dynamics in Refugee and IDP Camps: Customization, Permanency, and Opportunities. *Proceedings of the 2017 Workshop on Computing Within Limits - LIMITS '17* (Santa Barbara, California, USA, 2017), 11–20.

[78] Saieh, A., Brown, D. and McCluskey, P. 2018. *The long road home. Achieving durable solutions to displacement in Iraq: lessons from returns in Anbar*. The Danish Refugee Council (DRC), the International Rescue Committee (IRC), and the Norwegian Refugee Council (NRC). *https://www.nrc.no/globalassets/pdf/reports/the-long-road-home/the-long-road-home.pdf*. Accessed: 2019-02-08.

[79] Sakr, N. 2001. *Satellite Realms: Transnational Television, Globalization and the Middle East*. I.B.Tauris.

[80] Schlesinger, A., Edwards, W.K. and Grinter, R.E. 2017. Intersectional HCI: Engaging Identity through Gender, Race, and Class. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17* (Denver, Colorado, USA, 2017), 5412–5427.

[81] Schmeidl, S. 2000. The quest for accuracy in the estimation of forced migration. *Occasional paper / Thomas J. Watson, Jr. Institute for International Studies*. (2000), 127–158.

[82] Sokolowski, J.A. and Banks, C.M. 2014. A Methodology for Environment and Agent Development to Model Population Displacement. *Proceedings of the 2014 Symposium on Agent Directed Simulation* (San Diego, CA, USA, 2014), 3:1–3:11.

[83] Steele, A. 2009. Seeking Safety: Avoiding Displacement and Choosing Destinations in Civil Wars. *Journal of Peace Research*. 46, 3 (2009), 419–429. DOI:https://doi.org/10.1177/0022343309102660.

[84] Swagbucks - Free Gift Cards for Paid Surveys and More: *https://www.swagbucks.com/*. Accessed: 2019-02-22.

[85] Sydney, C. 2018. *Nowhere to return to: Iraqis' search for durable solutions continues*. IDMC and the Norwegian Refugee Council (NRC). *http://www.internal-displacement.org/sites/default/files/publications/documents/201811-iraq-case-study-report.pdf*. Accessed: 2019-02-08.

[86] Takagi, H., Kosugi, A., Ishihara, T. and Fukuda, K. 2014. Remote IT Education for Senior Citizens. *Proceedings of the 11th Web for All Conference* (New York, NY, USA, 2014), 41:1–41:4.

[87] Talhouk, R., Balaam, M., Bartindale, T., Montague, K., Mesmar, S., Akik, C., Ghassani, A., Najem, M., Ghatas, H. and Olivier, P. 2017. Implications of Synchronous IVR Radio on Syrian Refugee Health and Community Dynamics. *Proceedings of the 8th International Conference on Communities and Technologies - C&T '17* (Troyes, France, 2017), 193–202.

[88] Talhouk, R., Mesmar, S., Thieme, A., Balaam, M., Olivier, P., Akik, C. and Ghattas, H. 2016. Syrian Refugees and Digital Health in Lebanon: Opportunities for Improving Antenatal Health. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (Santa Clara, California, USA, 2016), 331–342.

[89] The World Bank 2018. *Forced Displacement of and Potential Solutions for IDPS and Refugees in the Sahel : Burkina Faso, Chad, Mali, Mauritania, and Niger*. *https://openknowledge.worldbank.org/bitstream/handle/10986/19975/899510WP0Box380splacement0study0WEB.pdf?sequence=1&isAllowed=y*. Accessed: 2019-01-07.

[90] Turner, L. 2015. Explaining the (Non-)Encampment of Syrian Refugees: Security, Class and the Labour Market in Lebanon and Jordan. *Mediterranean Politics*. 20, 3 (Sep. 2015), 386–404. DOI:https://doi.org/10.1080/13629395.2015.1078125.

[91] UNHCR 2017. *Operational Review of UNHCR's Engagement in Situations of Internal Displacement – Final Report*. https://www.unhcr.org/protection/idps/5a02d6887/operational-review-unhcrs-engagement-situations-internal-displacement.html. Accessed: 2019-01-07.

[92] UNHCR 2011. UNHCR Resettlement Handbook.

[93] UNHCR Statistics - The World in Numbers: 2018. *http://popstats.unhcr.org*. Accessed: 2019-01-29.

[94] Urry, J. 2007. *Mobilities*. Polity.

[95] Wisniewski, P.J., Kumar, N., Bassem, C., Clinch, S., Dray, S.M., Fitzpatrick, G., Lampe, C., Muller, M. and Peters, A.N. 2018. Intersectionality As a Lens to Promote Equity and Inclusivity Within SIGCHI. *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems* (New York, NY, USA, 2018), panel08:1–panel08:6.

[96] Wong-Villacres, M., Kumar, A., Vishwanath, A., Karusala, N., DiSalvo, B. and Kumar, N. 2018. Designing for Intersections. *Proceedings of the 2018 Designing Interactive Systems Conference* (New York, NY, USA, 2018), 45–58.

[97] Xu, Y. and Maitland, C. 2016. Communication Behaviors When Displaced: A Case Study of Za'atari Syrian Refugee Camp. *Proceedings of the Eighth International Conference on Information and Communication Technologies and Development - ICTD '16* (Ann Arbor, MI, USA, 2016), 1–4.

[98] Xu, Y. and Maitland, C. 2017. Mobilizing Assets: Data-Driven Community Development with Refugees. *Proceedings of the Ninth International Conference on Information and Communication Technologies and Development - ICTD '17* (Lahore, Pakistan, 2017), 1–12.

[99] Yafi, E., Yefimova, K. and Fisher, K.E. 2018. Young Hackers: Hacking Technology at Za'atari Syrian Refugee Camp. *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems - CHI '18* (Montreal QC, Canada, 2018), 1–8.

[100] 2018. *Displacement Tracking Matrix DTM Round 107*. IOM IRAQ. *http://iraqdtm.iom.int/Downloads/DTM%202018/Nov-Dec%202018/Round107_Report_English_2018_December_IOM_DTM.pdf*.

[101] 2018. *Intentions Survey: Out-of-Camp IDPs Erbil Governorate, Iraq*. REACH. *http://www.reachresourcecentre.info/system/files/resource-documents/reach_irq_factsheet_intentionssurveyerbil_may_2018.pdf*.

[102] 2018. *IRAQ - Erbil Governorate - Baharka Camp. General Infrastructure - Updated 9 July 2018*. REACH. *http://www.reachresourcecentre.info/system/files/resource-documents/reach_irq_map_idp_baharka_overview_9july2018_2.pdf*. Accessed: 2019-02-08.

[103] 2018. *IRAQ - Erbil Governorate - Debaga Camp. General Infrastructure - Updated 20 July 2018*. REACH. *http://www.reachresourcecentre.info/system/files/resource-documents/reach_irq_map_idp_debaga_overview_20jul2018_0.pdf*. Accessed: 2019-02-08.

[104] 2018. *IRAQ - Hasansham U2 Camp. General Infrastructure - Updated 4 July 2018*. REACH. *http://www.reachresourcecentre.info/system/files/resource-documents/reach_irq_map_idp_hasanshamu2_overview_19sep2018_1.pdf*. Accessed: 2019-02-08.

[105] 2018. *IRAQ - Khazer M1 Camp. General Infrastructure - Updated 18 January 2018*. REACH. *http://www.reachresourcecentre.info/system/files/resource-documents/reach_irq_map_idp_khazerm1_18jan2018_0.pdf*. Accessed: 2019-02-08.

[106] 2018. *IRAQ: Camps Intentions Survey Round 2 National Level, January 2018*. REACH. *https://reliefweb.int/sites/reliefweb.int/files/resources/61699.pdf*. Accessed: 2019-02-08.

[107] 2017. *Obstacles to return in retaken areas of Iraq*. IOM IRAQ. *http://iraqdtm.iom.int/specialreports/obstaclestoreturn06211701.pdf*. Accessed: 2019-02-08.

Appendix 1: Technology in Camp Survey

GENERAL INFORMATION

1. Age_____

2. Gender: Male   Female

3. Status: Refugee   IDP   Neither

4. Household Size_____

5. Number of children _____Number of children enrolled in school_____Number of literate children _____

6. Current Occupation_____

7. Previous Occupation (for example, prior to coming to camps)_____ :

8. Highest education achieved (circle one):

   None   Primary School   Middle School   Secondary School   Diploma or Vocational Certificate

   Bachelor's Degree (including medicine)   Master's Degree   PhD or higher

9. When did you move to this camp? Year _____ Month _____

10. How often do you leave the camp (for shopping, work, doctor visits, etc…)? _____

11. What type of shelter do you currently live in?

A UNHCR tent   Iraqi government tent   A tent with concrete bathroom and kitchen

Caravan   Concrete house   Other:

12. When did you move to your current shelter? Year _____ Month _____

13. What other types of houses have you lived in during the past five years (in or outside the camp? For example an apartment, concrete house, mud house, tent _____

14. Did you design or modify your tent/caravan/house in the camp?

15. If you live in a concrete block house, did you build it yourself with help from friends and neighbors?

16. Did you design the house that you lived in before coming to the camp?

17. Did you build the house that you lived in before coming to the camp?

18. What ICT devices did you take with you while escaping war?

TECHNOLOGY ACCESS

19. Which of the following technologies do you have access to (can own, borrow, access in camp training center)? How often (daily, few times a week, once a week, less than once a week)? And how good is that access (reliable, ok, bad)?

	I have never heard of this device	How Often?				How good is that access?		
		Daily	Few times a week	Once a week	Less than once a week	Reliable	OK	Bad
1. Smart phone								
2. Feature phone								
3. SIM card								
4. Tablet								
5. Laptop								
6. Desktop								
7. Camera								
8. Memory card								
9. Internet (through data card) on a phone or tablet								
10. Internet (through wifi) on a phone or tablet								
11. Internet (through data card) on a computer								
12. Internet (through wifi) on a computer								
13. Home phone								
14. TV								
15. Satellite dish								
16. Printer								
17. 3D printer								
18. Radio								
19. Cooking range/gas top								
20. Conductive cooling device								
21. Water cooler								
22. Fridge								
23. Gas heater								
24. Electric heater								
25. Other:								

20. What prevents you from owning electric or ICT devices?

Device cost   Maintenance cost   Charging cards cost   They are not allowed in the camp

Fear of theft   Fear of misuse   Security reasons   Have no place to buy them

Unreliable infrastructure   Other _____

ICT DEVICES IN CAMPS

21. How proficient are you in using digital devices?

22. How much do you spend on digital devices?

23. Do you share your mobile phone with others?

24. Do you share a minutes card with others?

25. Do you share a sim card?

26. Do you make local phone calls? ____ international phone calls?

27. Do you record audio with your mobile phone?

28. Do you record video with your phone?

29. Do you take pictures with your phone?

30. Do you send or receive text messages on your phone?

31. Do you send or receive photos messages on your phone?

32. Do you send or receive videos on your phone?

33. Circle all the social media apps that you use:

    Facebook   Instagram   Twitter   Viber WhatsApp   Other (list): ___

34. Circle all the social media apps that you use to share pictures and videos:

    Facebook   Instagram   Twitter   Viber WhatsApp   Other (list): ___

35. With whom do you share pictures and videos:

    Immediate family   friends   Neighbors   Family outside the camp   Other(list):

36. If you did not have internet connection, what do you use to share pictures and videos:

    I show them directly on the mobile device   Bluetooth   Memory Card   Other: ____

37. What benefits do you and your family gain by using digital technology (or the potential benefits if you do not use such technology)?

38. What benefits do you and your family gain by using digital technology (or the potential benefits if you do not use such technology)?

39. If you had the choice, would you go back to where you lived before war, stay in the camp, move to an Arab country, or immigrate to Europe or the US? And why?