

# *Disabled but not disqualified*

*Opening the door to possibilities for  
persons with disabilities*



# *Executive Summary*

This research focussed on the effect of ICT policies and strategies on access and utilization of ICTs and assistive technology by persons with disabilities in Uganda. The study was a mixed methods research with 373 persons with disability respondents to semi structured interviews whereas 24 in-depth interviews and 18 Key informant interviews from government agencies, and disability led organisations.

The results of the study indicate that among factors that affect access and use of ICTs and assistive technology is the high cost of devices, lack of awareness of the existing policies and strategies by policy makers and other caretakers. Findings revealed that Uganda is not explicit about ICTs and assistive technology for persons with disabilities despite having a policy in place. The inadequate access and use of ICTs and assistive technology by persons with disabilities hinders persons with disabilities capacity and the opportunity to live independently as well as experience equal and full participation in opportunities in society.

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# *Introduction & Background*

According to the World Health Organization (WHO) and International Classification of Functioning and Disability (ICF), disability is defined as impairments, activity limitations and participation restrictions in any life situation resulting from any health condition whether congenital or acquired (WHO, 2001). Different disabilities include physical disability, visual, speech, and hearing impairments (Matilde, 2006). Assistive technology refers to the development and application of organized knowledge skills, procedures and policies relevant to the provision, use and assessment of assistive products. This, therefore, includes training in the use of assistive technology, and other infrastructure technologies including ICTs that promote the effectiveness of assistive technology. Assistive devices, equipment, instruments and software are products either specially designed or produced whose primary purpose is to maintain or improve an individual's functioning and independence thereby promoting their wellbeing (Malcolm et.al, 2018). Persons with disabilities make up a significant proportion of the global population where 15 percent of women, men, and children live with a disability according to the World Report on Disability, 2011 (WHO, 2011). The rate of disability in high-income countries is approximately 11.8 percent compared to 18 percent for low-income countries (World Bank, 2011) and it is specifically higher in African countries where approximately 80 million people are living with disabilities (UN, 2016).

We live in a digital age, where technology plays an important role in most people's day to day lives and it has become the leading medium for communicating, transacting, informing, educating, and entertaining all over the world. To persons with disabilities, technology presents an unprecedented opportunity for their inclusion (Hersh, 2007). The current international normative frameworks which include provisions on ICT for persons with disabilities focus mainly on affordable and equitable access, removing barriers in access to ICT for persons with disabilities and promoting ICTs that respond to the needs of persons with disabilities (UN, 2018). ICTs and assistive technology today permeates almost all

development activities including healthcare, employment, accessing online government services, political participation, emergency and humanitarian actions, and ensuring access to accessible and assistive technologies to persons with disabilities is hence an important element in all dimensions of development programming and decision-making.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) refers to access and use as a general principle and a stand-alone right for persons with disabilities (CPRD, 2006). The convention thus recognizes the critical role that information and communication play in ensuring that persons with disabilities fully enjoy human rights and fundamental freedoms. This means that all disabled individuals should be able to access and use ICTs and assistive devices without fear of social and financial hardships. The use of ICTs in developing countries is steadily increasing with the use of ICTs in communication, information sharing, financial transactions and other aspects of life but this has not been realized for persons with disabilities as they continue to experience limited access, awareness and acquisition of needed technology products. Estimates suggest that only 15-25% of individuals who need assistive devices have access to it in the developing world (Mji,G & Edusei, 2019). Recent research studies in several countries in Africa show that barely 7-37% of individuals with disabilities have access to assistive technology (Johan & Lindstorm, 2017).

According to the Uganda National population and housing census report, the overall disability prevalence is 12% and this is higher among women(14%) compared to men(10%). Persons with disabilities are among the vulnerable groups in Uganda and they continue to face a myriad of daunting challenges in enjoying community participation in society that in turn violate their human rights. Such violations include discrimination in services delivery, employment, business, stigmatization from the wider community, as well as general marginalization in terms of economic, social and political rights

**Contribution of ICTs and assistive technology to the development and well-being of persons with disabilities**



(S Jagannathan, 2018).

Without accessible environments including accessible schools, public spaces, roads, and accessible modes of transportation, persons with disabilities will not be able to fully realize the potential of assistive devices. Acholi region in Northern Uganda suffered 20 years of insurgency which raised the number of persons with disabilities in the area arising from the several mutilations that were carried out by the Lord's Resistance Army

(LRA). A report by the Uganda Bureau of Statistics shows that in the Acholi region, the prevalence of disability is 17%, ranking second after Lango region (21%)(UBOS, 2019). According to a report by Uganda Communications Commission (UCC) on access and usage of ICTs established that only 69% own mobile phones, 3.9% had laptop computers, 1% desktop computers, while only 15% had access to the internet (UCC, 2018). The ICT policy for disability Uganda lays out strategies and ways to ensure that persons with disabilities access and use

ICTs and assistive technology. However, sparse information is available on how the policy has affected access and use of ICTs and assistive devices in this region to guide comprehensive policy implementation. Therefore, the

present study was conducted to assess the effect of ICT policies and strategies in Uganda and how they affect access and use of ICTs and assistive technology by persons with disabilities in Acholi region in Uganda.

## *Methodology*

This study was conducted in four districts from Acholi region that is made up of seven districts, but only four were selected: Gulu, Nwoya, Pader and Omoro. Acholi region is located in Northern Uganda. The study population comprised 373 people with physical disabilities aged 15 years and above living in the districts of Gulu, Omoro, Nwoya and Pader. Categories of disabilities included persons with permanent mobility, visual, speech and hearing impairment from any health condition whether congenital or acquired. The study employed mixed methods; quantitative and qualitative methods of data collection. The sample size for this study was calculated using Kish Leslie (1964) formula for a single proportion. The study employed a simple random sampling technique to select study respondents. In order to reach out to the study participants, the leaders of disabled persons organizations that are under their

umbrella organization NUDIPU helped to trace the study respondents in the four districts.

Data was collected using interviewer-administered questionnaires by trained research assistants.

The English questionnaires were translated into the local language (Acholi) and then back-translated to English to ensure that the translated version does not alter the meaning of the questions prior to their use.

Quantitative data was uploaded from Kobo toolbox, an online data collection tool, checked and cleaned for mistakes thereafter exported to SPSS version 25 for analysis. Data was presented using appropriate frequency tables using percentages or proportions. Qualitative data were transcribed into MS-Word and analyzed using content analysis to come up with themes that were used to triangulate quantitative data.

# Results

## Socio-demographic characteristics of study participants

A total of 373 participants were included in the study. The mean age of the study participants was 39 years. More than a half (53.6%) of the study participants were female while more than a quarter (27.3%) were in the age range of 25 to 34 years. Less than a half (41.6%) of the study participants had attained primary education, whereas more than a quarter, (27.1%) were self-employed. All the study participants were disabled and the majority (67.3%) of study participants had physical disabilities, less than a quarter (15.3%) and (14.2%) had hearing and visual impairments respectively. (Table. 1)

Variable	Category	Frequency (n)	Percentage (%)
Sex	Male	173	46.4
	Female	200	53.6
Age	15-24	68	18.2
	25-34	102	27.3
	35-44	74	19.8
	45-54	67	18
	55+	62	16.6
Marital status	Married	199	53.4
	Single	120	32.2
	Divorced/separated	33	8.9
	Widowed	21	5.6
Education Level	No Education	70	18.8
	Primary	155	41.6
	Secondary	70	18.8
	Post-Secondary	78	20.9
Occupation	Formal	34	9.1
	Informal	55	14.3
	Self employed	101	27.1
	Unemployed	183	49
Type of Disability	Physical	251	67.3
	Visual	53	14.2
	Hearing	57	15.3
	Speech	12	3.2

## Access and use of ICTs and assistive technology [highlighting how participants have benefited from the use of AT and ICTs]

According to a report by OECD access and use of ICTs can be measured by looking at the extent of indicators that are stated in the ITU International telecommunication

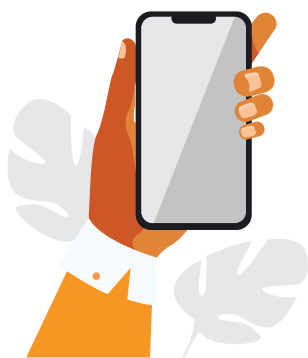
Indicators database. These include the proportion of persons with disabilities with access to a radio, television, mobile phone, computer as well as those who used the internet in the last 12 months. Similarly, indicators for access and use of assistive devices are also measured by looking at the number/proportion of persons with

disabilities who have access to assistive devices and technology, and those who have used these disaggregated by age, sex, disability, among other (Core ICT indicators, OECD, UN, 2005, and WHO, 2015).

In this study, participants were asked about access and use of ICTs in the last 12 months and overall, the most accessed and used ICTs were mobile phones (79%) and radios (74%). Mobile phones used range from simple handsets that receive and make calls and texts, to sophisticated smartphones that enable access to the Internet and other applications. Increasingly, for persons with disabilities, mobile phones are not used just to make and receive a call, but have become the main means by

which people access information from the Internet. The wide use of mobile phones is attributed to the accessibility features contained in the mobile phones which make it easy for persons with disabilities to use the phones to communicate, and network with others (ITU-D, 2017).

Other uses listed for mobile phones included financial transactions through mobile money services (80%) which most of the persons with disabilities have found to be easier to use compared to the banking services, connecting to social media platforms (37%). A respondent from one of the districts narrated how useful his mobile phone was to him:



*“With my phone, I can make voice calls to people, text my contacts for social and business connection. I can access the internet on my phone through Wi-Fi and also when I have money to buy internet data. I am able to send/receive email messages; whether personal or official. I use my phone also for transacting Mobile Money wherever I am”*

*- IDI\_Visually impaired\_Omoro*

On access to television, only thirty-three percent (33%) reported access and use television to watch the news and other programs.

However, when asked whether television broadcasters offer specialized services for PWDs, 42% reported televisions have sign language interpreters for the main newscast but no other programs. On access and use of computers and the internet, only 14% reported using a

computer in the last 12 months while the majority, (67.3%) of participants do not have access to the internet. Then only 26% that use the internet subscribe on a daily basis (58.3%) while 35% connect to the internet using Virtual private networks (VPN). They mentioned using the internet for social networking (81%), sending or receiving emails, (67%), and getting information about goods and services online (54%).



*“Using my laptop is assisting me a great deal in my current study since I can download online notes for my course and read them using **Plectalk**, the sound-producing applications installed. I have an application installed on my phone that can detect values of currencies thus saving me from being exploited at cash transaction points. The voice reader application has been very instrumental in helping me identify contacts in my phone book so that I do not have to guess who the caller is”*

*- IDI\_Visually Impaired\_Omoro*

In all the four districts less than a quarter of participants (11%) and (10%) had used a hearing and audio recorder/player respectively in the last 12 months. (67%) of participants reported not using any assistive technology in the last 12 months despite having the need to use them. Access and use were further looked at in terms of age, sex, disability using mobile phone access and use as a proxy indicator. Results revealed that participants aged

25-34 years ranked highest in access and use of the five key access and use indicators, while for sex, males accessed and used ICTs and assistive devices more than women. For the disability category, participants with physical impairments accessed and used more of the five indicators than other categories of disability. One in-depth interview participant explained why women had low rates of access and use of ICTs and assistive devices:



*“Like the cost of buying internet, because it is easier for a man to get money for buying some of these items than a woman. And it is also very hard for a woman to think of accessing some of these devices unless they are supported, but also women in our society tend to be less educated traditionally, so to some extent they may have little less access to ICTs compared to the men”*

*- IDI\_Physical impairment\_Gulu.*

**Table 2: Access and use of ICTs by selected socio-demographic characteristics**

Variable	Category	Percentage (%)
<b>Sex</b>	<b>Male</b>	<b>61.2</b>
	<b>Female</b>	<b>38.8</b>
<b>Age</b>	<b>15-24</b>	<b>15.6</b>
	<b>25-34</b>	<b>33.2</b>
	<b>35-44</b>	<b>26.8</b>
	<b>45-54</b>	<b>12.8</b>
	<b>55+</b>	<b>11.6</b>
<b>Disability</b>	<b>Physical</b>	<b>47.5</b>
	<b>Visual</b>	<b>12.2</b>
	<b>Hearing</b>	<b>32.0</b>
	<b>Speech</b>	<b>8.3</b>

### **Support systems and promotion of access and use of ICTs**

In this study, we wanted to know about organizations and institutions promoting and supporting persons with disabilities in the four districts to ensure they access and use ICTs and assistive devices. Results showed that across all the four districts, the umbrella organization for disabled persons National Union of

Disabled persons Uganda (NUDIPU) is engaged in promoting access to ICTs and assistive devices through working with Disabled Persons Organizations (DPOs) at the grassroots level. Others mentioned include Gulu Disability Union (GDU), AVSI Uganda, Whitaker Peace & Development Initiative Organization (WPDI), Sight Savers Uganda, BOSCO Uganda, and Uganda National Association for the Blind (UNAB), Uganda National



Association for the Deaf (UNAD), National Union of Women with Disabilities of Uganda (NUWODU), Land mine Survivors, and World Vision. Some local Radio stations, health facilities and worship centres were also mentioned. These organizations and institutions promote and support access and use of ICTs and assistive devices through the donation of assistive devices like wheelchairs, hearing aid, white cane, magnifying glasses, and prostheses like artificial limbs. Others have tried to carry out advocacy for an inclusive environment like advocating for infrastructure that enables persons with disabilities to access and use ICTs and assistive devices like negotiating with financial institutions; banks in Gulu to provide ATM disability friendly services, advocating for the construction of ramps in all government offices and financial institutions entries and exits to enable persons with disabilities to access the premises.

### ***Barriers to access and use of ICTs and assistive technology.***

Results revealed that there has been little and in some instances no implementation of ICT policies and strategies for persons with disabilities. This has in turn created barriers that have hindered access and use of ICTs and assistive technology by persons with disabilities. It was noted that on a daily basis persons with disabilities face a range of barriers and challenges relating to access and use of ICTs and assistive technology. In this study, we asked about the factors that hinder access and utilization of ICTs and assistive technologies for PWDs and 76% reported that the prices of ICT and assistive technologies are high as well as the cost of other additional services that are necessary to use some ICTs and assistive devices like internet and data bundles. Seventy-five percent (75%) reported a lack of knowledge and information about available devices as well as how to use them.

The following are case studies that were collected during data collection that present the barriers to access and use of ICTs and assistive technology among persons with disabilities.

### ***High prices of ICTs and assistive devices and other additional costs.***

On the cost of ICTs and assistive technology, it was noted that with the few ICTs and assistive devices available on the market, most of them are not quite affordable for those in need. Prices for buying and maintaining assistive devices/technology were reported to be quite high. For instance, it was noted that JAWS software for visually impaired persons costs 1200USD for a single key license, other devices like hearing aids, white cane, also cost between 16-40USD. A look at the occupation of participants of this study shows that not all of them have the financial capability to cater for these tools. Most of the participants were in the bracket of the unemployed therefore finding it hard to access assistive devices and ICTs.

Additionally, participants stated that they find themselves in the dilemma of trying to choose between the basic needs and ICTs and assistive devices and they are forced to pick the basic needs over the latter. It was revealed therefore that most of them get these devices as donations from organizations and well-wishers.

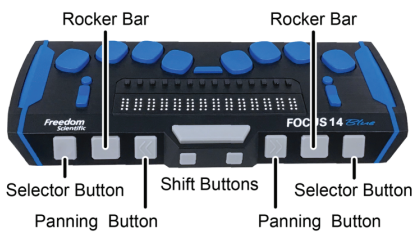
Institutions like Gulu Disability Union, PESCA, that have tried to support have also been hindered by lack of funds to sponsor technology.

Further costs were mentioned for other things that are useful for the functioning of ICTs and assistive devices to access information. Among those mentioned was the cost of data bundles to connect to the internet, paying for training on how to use the devices, electricity to charge some of the rechargeable devices. Cost was also mentioned for training on the use of ICTs and assistive devices acquired by persons with disabilities. This includes money to pay the trainers as well as the transport to the training venue since trainers are not located in one place. It was noted that a package for training in the use of ICTs costs between 50USD - 60USD.

The expensive nature of these devices was also affirmed by one of the key informants who is a service provider of these devices:



*“Most of the people with disabilities are not employed, and the prices of these things are really high because we import most of them from the USA, Germany, and other countries. For example, we have **JAWS** at \$1200 for a single license. The magnifying glasses range from 30,000 Ugx and above. For lenses, we don’t do the measurements so the person has to first go to hospital for measurements. We have a Doctor at Mengo Hospital where we refer our clients. Some magnifiers are electric and have to be charged all the time. We also have talking calculators, talking watches, braille display and this cost 40,000 Ugx. We also have **Perkins braille** but those who can’t afford usually use the slates and stylus which is 50,000 Ugx. We have a braille kit that contains slate and stylus, alphabet and costs 30,000 Ugx. A braille kit can be used by a child from primary three and above and goes for 250,000 Ugx. Most of the devices we have for the visually impaired have speech. There is a braille keyboard one can connect to the phone, computer, PowerPoint and whatever you type it reads and it is currently at 2.5million Ugx. We also have white canes (with a rolling tip and without) and ranges from 50,000 Ugx - 70,000 Ugx. Most of the software needs to be updated for one to be online. So you find that we tell persons with disabilities that we can give them something that will help them read, but they are left out when it comes to the prices.”*



*- KII\_Devices Service Provider.*

It was thus noted that such barriers on the cost of devices and other needed services discourage users, make them lose interest in using ICTs and assistive technology.

***Lack of knowledge and information about available devices as well as how to use them.***

There is a lack of knowledge on the available ICTs and assistive technology on the market as well as the services providers who sell these devices. It was revealed that the issue of disability and technology is relatively new and so many persons with disabilities are not yet aware of it. But also the lack of awareness of ICTs and assistive technology for both persons with disabilities and the general public.

Most people do not know that persons with disabilities need assistive devices and that it’s their right to have them. At some level, lawmakers do not know that they need to remove taxes from these equipment and services. Sometimes persons with disabilities are not aware of where to procure the assistive devices. More barriers were noted on insufficient knowledge on how to use ICTs and assistive devices, no training has been

given to persons with disabilities to equip them with skills to use technology. Participants noted that technology keeps changing and most information communication technology devices are hard to operate with basic knowledge since most of them have relatively low levels of education and find difficulty in operating these devices, despite the desire to use them. Insufficient knowledge on how to use the devices has contributed to some persons with disabilities being left out on activities and their needs overlooked.

An example was given by one of the participants on the current situation where most of the work, collaborations and other several interactions have been moved online, and a large section of persons with disabilities have been put on the backburner as the world struggles to transfer most of the activities:



*“Like now during this COVID-19, every meeting is organized on zoom which is the new normal that we are talking about but no one has trained persons with disabilities like those with hearing impairment, those with visual impairment or those with intellectual impairment on how to use zoom and be able to attend meetings. Most of the persons with disabilities have been left out. When you organize a zoom meeting but the person has a hearing impairment, he may not be able to attend because they have not been trained on how to use the zoom systems or this technology to attend meetings. There is mobile banking a person with disability doesn’t have a phone and doesn’t know how to operate a phone, therefore, he can’t use the mobile banking system”*

*- KIL MOE*

### **Discussion**

In this study, to find out the effect of ICT policies and strategies on access and use by persons with disabilities, it was revealed that there has been minimal implementation of these policies and strategies which in turn has created barriers that have hindered access and use of ICTs and assistive devices by persons with disabilities. These barriers were majorly found to be the cost of ICTs and assistive devices, lack of awareness on the available products and where to get them from.

According to the CPRD, access to ICTs and assistive technology is an essential component for improving the lives of persons with disabilities that should be done by all member states. This means that individuals should be able to access and use ICTs and assistive technology with minimal obstacles. The ICT policy for disability Uganda 2017 set out to ensure that ICT based interventions for persons with disabilities are not limited to ad-hoc processes and to guide the development and supply of accessible ICTs. To this end, some progress has been made at the policy level with respect to disability inclusion, but a lot remains to be done before full inclusion is achieved.

With no corresponding commitment to policy implementation, the participation of persons with disabilities in development through the use of ICTs and assistive technology will be limited thus their socio-economic status will remain static (Raymond Lang et.al, 2017).

Previous studies have shown that access and use of assistive devices can improve the quality of life of

persons with disabilities and promote independent living. The barriers to ICT and assistive technology use that were raised in this study are consistent with other studies conducted in Uganda (May-Teerink, 1999), Ghana (Naami. A, 2015) and Nigeria ( Emaka. P & Chukwunalu.D, 2019) where the cost of, and lack of knowledge on the available ICTs were the major barriers to access and use of ICTs and assistive technology among persons with disabilities.

In this study, the cost of ICTs and assistive devices was one of the major barriers to access and use of assistive technology. This is consistent with findings from a study also conducted in Uganda that indicated that lack of economic means is a primary barrier to assistive technology. This could be attributed to the fact that the majority of persons with disabilities are unemployed thus they do not have the financial capability to purchase these devices and other ICTs. Women were mostly affected by this barrier to access. Women were less likely to afford ICTs and assistive devices as well as paying for additional costs like the internet. This could be attributed to their lack of employment, low levels of education, and the socio-cultural position of women in the region. This is consistent with what was studied in Malawi (men 25.3% and women 14.1%) and Zambia (men 15.7% and women 11.9%) where gender inequalities in access to assistive devices were evident (WHO & World Bank, 2011).

Furthermore, this study revealed that assistive device technologies, hearing aids, speech therapies and vision

aids among others are essentially unknown to people with disabilities. The study findings are consistent with another study conducted in Nigeria among visually impaired persons in five Southern states where a large proportion (64%) of participants were not aware of the existence of assistive technology and only 17.4% had good knowledge on how to use them (Emaka. P & Chukwunalu.D, 2019) This could be because participants who were aware of rehabilitation services were more likely to know the benefits, available services and facilities providing such services which could make them utilize the services, unlike their counterparts who were not aware of the services. Similar findings were reported by previous studies conducted in Nigeria among visually impaired persons in five Southern states where a large proportion (64%) of participants were not aware of the existence of assistive technology and only 17.4% had good knowledge on how to use them (Emaka. P & Chukwunalu.D, 2019) Given the increasing number of people with disabilities in Uganda, it appears that the task of sensitizing PWDs, policymakers and the public about the available ICTs and assistive devices/technology is of paramount importance. Therefore, the government and other non-government organizations should increase sensitization and awareness of ICTs and assistive technology, their benefits, available services and service providers providing such services among people with physical disabilities and the general public.

In this study, we found that persons with disabilities continue to face exclusion from other services like financial services, access to programs on television, education, employment and healthcare. For instance, persons with hearing impairments that have access to television can only watch the news where sign language is provided for but not on other programs. Other programs are equally beneficial to this category because they focus on all aspects of life. Unique challenges for persons with disabilities were revealed when it came to accessing banking services. Results showed that most persons with disabilities we spoke to are either not using bank services meaning they have no savings bank

accounts or are relying on alternative financial services like mobile money and small saving groups. They reported facing physical barriers to accessing financial services. People with disabilities have a range of auditory, cognitive, physical, speech and visual abilities which may not be catered for in all the bank sections and other financial institutions. This situation cuts across other sectors like education, health, and business sectors. While online banking may eliminate such barriers, there are barriers to it as well as few participants own and use computers (29%) and smartphones (30%) have access to the internet. to access. No braille language is available on ATMs; a few of them can only speak. These instances were also reported in studies conducted in Malawi (Harrison et.al. 2020), in Uganda (Ojok, 2013) and in South Africa (Estelle and Johannes, 2016). To ensure this access to ICT, the CPRD further calls for removing barriers to information, communication and other services including electronic services and emergency services and to promote the design, development, production and distribution of accessible ICT at an early stage (CHANDRA, 2018).

Removing barriers to access and use of ICTs and assistive technology is the overarching call by the UN convention on the Rights of Persons with Disabilities (CRPD). Given the unique barriers faced by persons with disabilities, financial institutions and other stakeholders should make an effort to provide accessible services that meet the needs of these people.



*“The notion that disability is expensive needs to change, disability is not a property. It is a condition. I think what we need to do is to avoid our disability and make ability a priority by improving our technologies and supportive strategies”*

*- KIL\_NUDIPU.*

People with disabilities have a compromised quality of life. The use of assistive technology can improve the quality of life, promote independent living. Generally, children and young adults with disabilities have a longer way to live than older adults with disabilities. Therefore, augmenting their life from an early age with the use of assistive technology is of paramount importance (Senjam, 2019).

Additionally, the fundamental component of the WHO Global Disability Action Plan 2014-21 is to improve access to assistive technology for persons with disabilities. (WHO, 2014)

Four key messages arise from findings of this research that warrant significant attention by policymakers and implementers, DPO and other stakeholders:

## 01

**Awareness raising:** Given that persons with disabilities are not aware of ICTs and assistive devices available on the market and where to get them from, there is a dire need and potential for government to play a leading role in ensuring that there is the provision of support to create awareness among persons with disabilities on the available devices and where to get them from. Awareness campaigns can also be targeted at informing stakeholders on the inclusion of PWDs.

In addition to different measures, there also needs to be a multi-pronged approach in terms of strategies. Government authorities must spend time, effort and money variously on raising awareness among their own employees and the public of the need to create an inclusive and barrier-free society; sensitize their staff to respond to the needs of persons with disabilities; carry out capacity-building activities such as accessibility training to facilitate the implementation of accessibility; audit existing and new programs for accessibility and regularly monitor its implementation and compliance; support DPOs and NGOs in aiding persons with disabilities, and build up the capacity of trainers and resource centres to train people in using these technologies. This life cycle of accessibility implementation and integration needs to be followed through in each domain of activity.

Key informants further also recommended developing a resource booklet that can be distributed in different districts. The booklet should show the different devices available and where to get them from because there are different service providers some are into health others sports and leisure as well as organize forums where all service providers exhibit what they do and have as a way of creating awareness.

## 02

**Advocacy:** Additional findings from this research showed that more of the work of promoting access and use of ICTs and assistive devices is done by disabled persons organizations (DPOs) and other NGOs. From observing global practices and trends literature has shown that all successful initiatives have been through a partnership between government, DPOs and the private sector to create a truly inclusive world.

Therefore, as a primary strategy to improve advocacy for access and use of ICT and assistive devices, government agencies should seriously consider supporting and promoting the work of DPOs and NGOs. This will help achieve immediate results since there is already a direct connection between these DPOs, NGOs with the beneficiaries.

For instance, allocating a portion of the national budget to enable blindness organizations to undertake the conversion of books into accessible formats would go a long way towards ensuring that books become available to persons with print disabilities in a timely manner and in relevant formats. DPOs are often able to find innovative and frugal solutions to address specific challenges, faced by PWDs in accessing and using ICTs and assistive technology. Thus DPOs have to work together to advocate for the rights of persons with disabilities. Further, it should be noted that implementation of policies and strategies for access and use of ICTs and assistive technology by persons with disabilities is not only for the ministry of ICT, rather different spheres bound within this system; education, health, labour and social development, transport and works, where each ministry/MDAs can independently implement and ensure accessibility and use of ICTs and assistive technology by persons with disabilities. Such collective focus on implementation by all government ministries would explicitly ensure that there is near total inclusion of disabled persons in participation in different sectors.

## 03

**Subsidized prices and reduced taxes of ICTs and Assistive technology:** The government should promote access to affordable assistive devices and technologies beyond tax exemptions and reliance on donations. Also, negotiating with service providers to lower costs of technology in return for a larger sale volume has successfully brought down the cost of technology in many countries. First thing is to make

sure that taxes levied on some of the ICTs is low because the use of technology requires more money, especially what they call modified technologies or user-friendly technologies. And the bureaucracy also reduces because even for those equipment where tax waivers are done the bureaucracy, the process is too long. Oftentimes, equipment is left to languish in warehouses such as the bond and may succumb to degradation and rusting before it reaches its intended user or beneficiary.

## 04

**Research and innovation:** Investment in research to see which type of technologies is user friendly to people with different disabilities. Currently, there is less research in this area but also supporting innovation.

The government should consider investing in adaptive technologies. Local manufacturers here in Uganda can be encouraged or supported to start manufacturing assistive devices from here. To support innovation, research and planning, Uganda must have clear statistics about persons with disabilities by category. The available data is said to be insufficient. Research can also be done by the line ministry of ICT annually to establish how many persons with disabilities by category use ICTs and assistive technology but also have clear indicators of access and use of technology by these people. Such indicators will inform the monitoring and progress in terms of implementation of ICT regulations and policies to know where there is a gap. You will never know that gap when you don't have clear statistics. The inclusion of researchers, innovators, disability activists and advocates, as well as government and civil society, will render an inclusive forum to tackle some of these obstructions through constructive research, dialogue at workshops and meetings.

### ***Conclusion***

In the light of the analysis of this research, it must be stressed that there exists a considerable potential in PWDs using ICTs assistive technologies and alongside the many challenges that exist. New assistive technologies can provide the means to explore new ways for PWDs to live independently. However, these technologies can turn up as obstacles if they are applied without a commitment to the principles of equality, participation, and responsibility. To have a comprehensive solution to accessibility needs in the country, the government must consider a multifaceted approach to ensure that activities on disability issues are equally implemented and monitored like the other entire activities/government project. Special consideration during the implementation of disability activities should be given to women with disabilities, persons with visual impairments and the hard of hearing because of their low status in access and use of ICTs and assistive technology. The results of this study might also assist in the modification of programs that have previously been developed and aimed at training individuals to promote access and use of assistive technology.

### ***Limitations and further research***

A major limitation of this study is the smaller sample size, the study concentrated on only four districts. It would be important to extrapolate our findings by expanding our research by incorporating representatives from all over the country. This field of ICT for the PWDs in Uganda is a recent topic; thus, there is a wide scope within this field for further research. It would be worthwhile to expand our research using a larger sample size from various areas to further understand the use of assistive technology and ICTs by persons with disabilities disaggregated by age, sex, disability and geographical location. We are hopeful that results from this study will critically contribute to the knowledge building and research in the matters of governmental and non-governmental policies and programs-related ICT promotion in Uganda.

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