Use and Impact of Universal Service (Voice and Data) deepening usage for enhanced inclusivity in Kenya

LIST OF ACRONYMS

Communications Authority of Kenya / Universal Service Fund	CA/USF
Capital Expenditure	CAPEX
Convention on the Rights of Persons with Disabilities	CRPD
Digital Access Program	DAP
East Africa Research and Innovation Hub	EARIH
Focus Group Discussions	FGD
Foreign, Commonwealth and Development Office	FCDO
Gross Domestic Product	GDP
Human Centred Design	HCD
Information Communications Technology	ICT
International Telecommunication Union	ITU
ITU Telecommunication - Development	ITU-D
International Telecommunication Union - Telecommunication	ITU-T
International Telecommunication Union-Radio Communication	ITU-R
Key Informant Interviews	KII
Kenya Agricultural and Livestock Research Organization	KALRO
Mobile network operators	MNOs
Monitoring and Evaluation	M&E
Monitoring, Evaluation and Learning	MEL
National Government Administration Officer	NGAO
Online Data Kit	ODK
People Living with Disabilities	PWD
Quality of Service	QoS
Social Behavioral Research	SBR
Sustainable Development Goals	SDGs
World Telecommunication Information Society Day	WTISD

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Part I: Introduction:

Project background and Discovery

1. Executive Summary

This study sought to establish the current uses and impact of Voice and data USF projects implemented in Phase 1 following the 2016 Access Gap report. The Access Gap 216 report recommended filling Access gaps in 202 sub-locations across 17 sub-locations, out of which 75 sub-locations benefited from the installation of Mobile network infrastructure and provision of voice and data services. The ultimate goal of the study was to inform the development of strategies to deepen Voice and Data usage among these communities while ensuring inclusivity across different special groups. The research adopted a multi-method research design resulting in a partially mixed concurrent equal status as an anchor design. Consequently, the study obtained both qualitative and quantitative data. This report presents the Literature **Review**, **Research Methodology**, **Findings**, **Discussion of Findings**, and **Recommendations** as the main sections. Additional data and information is provided in the appendix.

Several data collection methods were used to increase the depth and breadth of data to ensure quality results. Secondary data was reviewed from publications both locally and the rest of the world. Four hundred ninety-eight end-user interviews were conducted across the beneficiary communities. In addition, over 98 key informant interviews were conducted, 18 self-administered surveys were received and 14 focused group discussions done. The findings from the study were integrated in a hierarchical yet iterative manner to obtain insights in line with the study. Through human-centred design, strategies for deepening usage were muted by integrating experience, expertise, and the insights gleaned from desk reviews. In-depth interviews into a set of concise recommendations were developed from the insights from user surveys for digital inclusion.

The study results present a mixture of issues on use and impact of USFs Voice and Data services. While it is clear that Voice and Data services have benefited these communities, there still exists immense opportunities for enhancement. Use and impact has been witnessed across various categories like Education, Health, Agriculture, Public Administration, Business and Social interaction and public awareness. In the same breath, challenges still abound, such as poor network quality, insecurity, illiteracy, high cost of devices and lack of power.

Through the use of Human-Centred design, the disaggregation of users among these communities resulted in targeted needs identification and development of solutions. Needs and solutions to deepen usage have been developed and proposed to cater for the uneducated youth and the elderly, women, persons living with disabilities, and tech-savvy youth living within these communities. In addition, interventions have been proposed to address the lack of complementary services and redefinition of the concept of coverage in evaluating the performance of USF projects. A new monitoring, evaluation, and learning framework is proposed. The new framework considers indicators in governance, social-economic impact, and institutional and capacity building.

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2. Introduction

96%

of populations are covered by both 2G/3G/4G mobile networks

56%

of the geographical area is covered by the same network provider.

Over **95%**

of the population is within 50 km of a fibre backbone node

The Foreign, Commonwealth and Development Office (FCDO) is committed to commissioning high-quality research that directly improves people's lives. The organization wants to make the research that they have funded easily accessible to decision-makers within and in the broader development community. The need for a "Use and Impact" research study was requested by the FCDO/Digital Access Program (DAP) and is managed by FCDO/ East Africa Research and Innovation Hub (EARIH). DAP aims to address fundamental constraints to digital inclusion and to stimulate the local digital economy through a multi-pillar holistic structure by conducting and implementing projects around the three pillars, namely; 'Models & Enablers'; 'Trust & Resilience'; and 'Sustainable Digital Ecosystems.

In 2021, DAP in collaboration with the Communications Authority of Kenya – Universal Service Fund (CA/USF) department concluded a study[1] commonly titled the Access Gap Study. The objectives of the study was to update the 2016 study and provide a new status of access gap in line with USF objectives of promoting communications infrastructure and services rollout in rural, remote and under-served areas; to ensure availability of communication services to persons with disabilities, women and other vulnerable groups; supporting the development of capacity building in ICTs and technological innovation; supporting the expansion of communication services to schools, health facilities and other organisations serving public needs; and facilitation of the development of and access to a wide range of local and relevant digital content.

Some of the key findings from the access gap study were: 96% of populations are covered by both 2G/3G/4G mobile networks while 56% of the geographical area is covered with the same network provider. Over 95% of the population is within 50 km of a fibre backbone node and 81% within 25 km. In advancing DAP Pillar 1 of 'Models & Enablers', FCDO/ East Africa Research and Innovation Hub commissioned Viscar Industrial Capacity Limited to research on a better understanding of the status and use of universal access to digital services, including voice and data services for marginalised communities to enable social-economic development.

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1   Viscar Industrial Capacity (2021). Capacity Building, Review and Update of the Voice and Data Services Access Gaps in Kenya Report to the Communications Authority of Kenya. Unpublished.

The research sought to explore the impact of previous USF projects in remote and underserved areas in extending voice and data services, how these were used by marginalised communities (remote, underserved geographies and demographics, vulnerable groups, excluded populations etc.) and strategies for how these uses can be further deepened to justify the investments in digital technologies, infrastructure, services, content including government services amongst these groups. This was to primarily inform DAP, its partners and update the USF strategies and programming.

Thus, the overarching aim of the research was to provide a better understanding of the status and use of universal access to digital services including voice and data services for marginalized communities to enable social-economic development. The primary purpose of this assignment was to help decision-makers in USF to implement interventions that would ensure the impactful implementation of USF programs with accurate and effective monitoring initiatives, as shown in the theory of change shown in Figure 1.
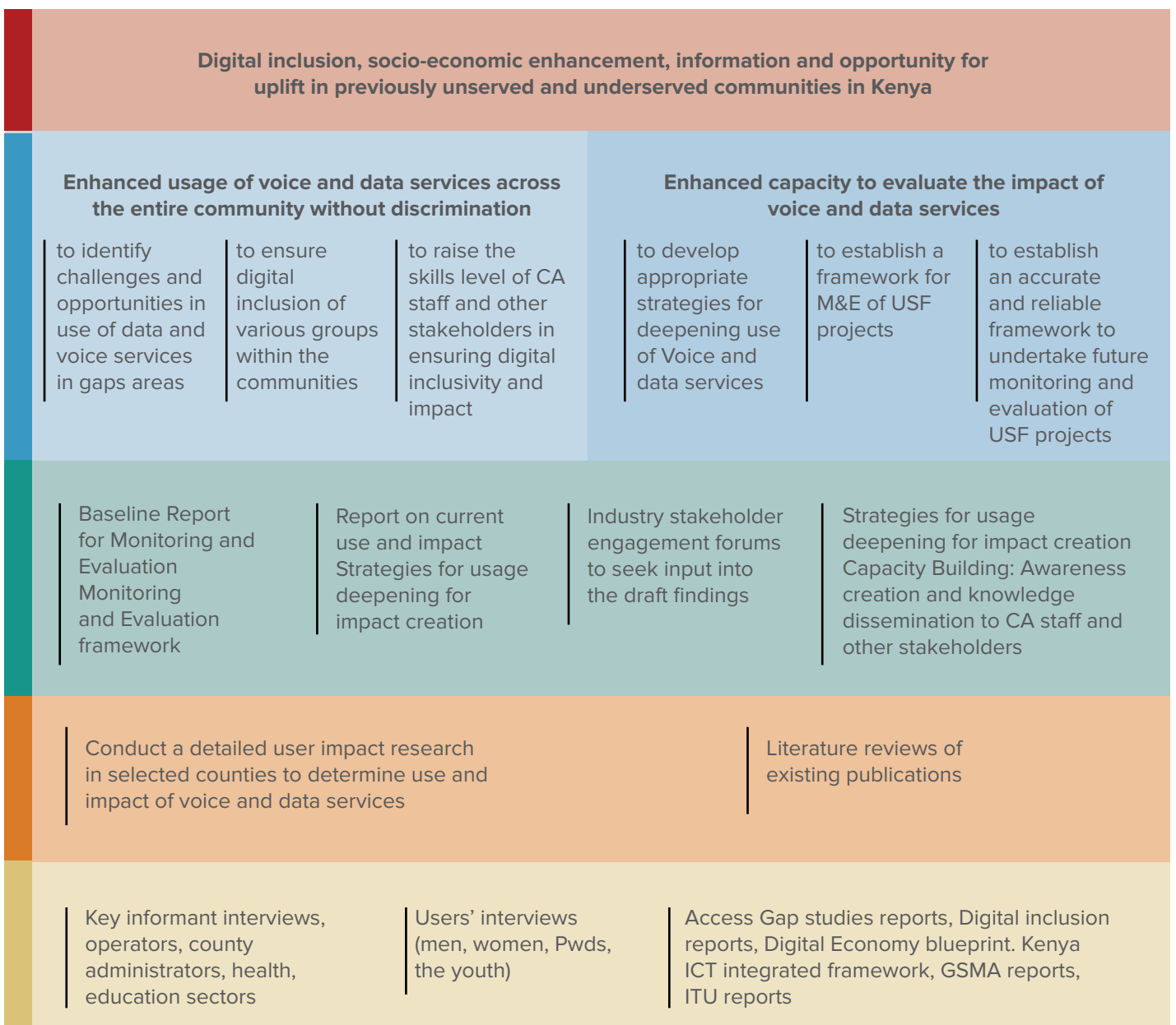
Digital inclusion, socio-economic enhancement, information and opportunity for uplift in previously unserved and underserved communities in Kenya

Enhanced usage of voice and data services across the entire community without discrimination

Enhanced capacity to evaluate the impact of voice and data services

| to identify challenges and opportunities in use of data and voice services in gaps areas | to ensure digital inclusion of various groups within the communities | to raise the skills level of CA staff and other stakeholders in ensuring digital inclusivity and impact | to develop appropriate strategies for deepening use of Voice and data services | to establish a framework for M&E of USF projects | to establish an accurate and reliable framework to undertake future monitoring and evaluation of USF projects |

Baseline Report for Monitoring and Evaluation Monitoring and Evaluation framework

Report on current use and impact Strategies for usage deepening for impact creation

Industry stakeholder engagement forums to seek input into the draft findings

Strategies for usage deepening for impact creation Capacity Building: Awareness creation and knowledge dissemination to CA staff and other stakeholders

Conduct a detailed user impact research in selected counties to determine use and impact of voice and data services

Literature reviews of existing publications

Key informant interviews, operators, county administrators, health, education sectors

Users' interviews (men, women, Pwds, the youth)

Access Gap studies reports, Digital inclusion reports, Digital Economy blueprint. Kenya ICT integrated framework, GSMA reports, ITU reports

Figure 1: Applied Theory of Change Framework

| INPUT | INTERVENTIONS | OUTPUT | OUTCOMES | IMPACT |

3. Literature review

3.1. An Overview of the status and roll-out of the Universal Services Fund and its services

Globally, Information Communication Technologies (ICT) is considered as an enabler of social-economic growth and remains an avenue to deliver quality goods and services in the areas that include health care, education, finance, commerce, governance and agriculture. As such, it helps to reduce poverty and hunger, boost health, create new jobs, mitigate climate change, improve efficiency and make cities and communities sustainable. All these are in line with the United Nations Sustainable Development Goals (UN/SDG)[2] leading to a global drive to embrace ICT through rapid deployment of ICT infrastructure and services.[3] Despite these efforts, the digital divide remains, with only one in five people in Low Developed Countries being online, and the gender gap being the widest and continues to grow in poor countries.[4] In recognition of the critical role of ICT in social-economic development, the International Telecommunication Union (ITU)'s development agenda works to close the digital divide and drive digital transformation to leverage the power of ICT for economic prosperity, job creation, digital skills development, gender equality, diversity, a sustainable and circular economy, and for saving lives.[5]

That digital access and inclusivity have social-economic transformation is now a universally accepted concept. As a country, Kenya developed strategies and initiatives like the National Infrastructure ICT Masterplan (2019-2029)[6], the National Broadband Strategy (2018-2023)[7] the Digital Economy Blueprint (DEB)[8], the Kenya Vision 2030, and the Universal Service Fund under Communication Authority, that ascribed to the need for digital access and belief.

The efforts to achieve digital access and inclusivity were developed as part of the findings from the Kenya Access Gap Studies. Previously, the Communications Authority (and its predecessor) undertook four (4) Universal Service gap studies in the years 2003, 2010, 2016, and the latest having been concluded in May 2021 under the sponsorship of FCDO/DAP.[9] The 2021 Gap Access Study indicated that over 96 % of the population was covered by both broadband and voice services.[10]

In Kenya, the Universal Service Fund is engrained in law and among others used to deploy ICT infrastructure and services among the unserved and underserved.[11] Between 2015 and 2021, USF financed the rollout of Voice and Data infrastructure in 75 sub-locations across 15 counties in the country. This rollout enabled the coverage of unserved areas with about five hundred thousand people thus recording a significant step in universal service. Even though the coverage was predominantly 2G, most operators have since then upgraded their networks in those areas to 3G and 4G, thus increasing the availability of broadband. In addition, USF also funded broadband connectivity in over 800 schools over the same period, thus enabling these schools to access data at reasonably good speeds. The provision of digital access through voice and

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2   https://news.itu.int/icts-united-nations-sustainable-development-goals/
3 -   How broadband, digitization and ICT regulation impact the global economy: Global econometric Modelling-November 2020
4   ITU (2019). Measuring Digital Development: Facts and Figures 2019. International Telecommunication Union.
5   ibid.
6   Republic of Kenya (2019). National Infrastructure Master Plan 2019-2029. Ministry of Information Communications and Technology. Nairobi
7   Republic of Kenya (2019). National Broadband Strategy 2018-2023. Ministry of Information, Communications and Technology. Nairobi
8   Republic of Kenya (2019). Digital Economy Blueprint: Powering Kenya's Transformation. Nairobi.
9   Viscar Industrial Capacity (2021). Capacity Building, Review and Update of the Voice and Data Services Access Gaps in Kenya. Report to the Communications Authority of Kenya. Unpublished.
10   ibid.
11   Republic of Kenya (2003). Kenya Information and Communication (Amendment) Act 2019

data services in the ICT gap areas of the country provides a huge opportunity for the USF to drive the Government of Kenya's vision for economic transformation and digital literacy into the most remote rural areas and excluded populations, which will help to achieve the vision for all citizens.

Kenya has made tremendous strides in the development and use of ICT services with the massive rollout of ICT infrastructure and services. Despite this, initial indicators showed that the digital divide still existed with 44% of the urban population having access to the internet as compared to 17% in rural areas.[12] According to ITU, only 23% of the Kenyan population have access to the internet.[13] In addition, People Living with Disabilities (PWDs) still experience challenges to access ICT. Such challenges include lack of enabling technologies, limited skills, lack of a policy on ICT, lack of accessible government websites, and lack of access to information.[14] The gender digital divide

remains high in Kenya. Kenya's Digital Economy Blueprint[15] acknowledges the digital divide between urban areas and rural areas stating as an example, 21.5% of rural youth do not own phones as compared to only 6.9% of their urban counterparts.

The 2021 Access gap study reports showed that about 1.6 million Kenyans stayed in areas without Voice and Data services. Whereas this portrayed a positive growth from the 2016 report, the same report recommended that more efforts should be directed towards deepening the usage to realize the benefits of ICT services among the underserved and unserved areas. Noting that previous USF projects have not paid much attention to inclusivity, the 2021 report recommended strategies that would ensure that persons living with disabilities, women, and other special groups were brought on board in line with USF objectives.[16]

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12   World Bank (2019). Kenya Economic Update 2019.
13   ITU 2021. www.itu.int/en/ITU-D/Statistics/
14   CIPESA (2021). Assessing the barriers Accessing to ICT by People with Disability in Kenya-2021
15   Republic of Kenya (2019). Digital Economy Blueprint: Powering Kenya's Transformation. Nairobi.
16   Updated Voice and Data Access Gaps-2021

3.2. USF Models in Africa

Several countries in Africa have adopted USF as a means to push ICT services to the remote regions that would otherwise be left out by commercial providers. Over 68% of countries in Africa have USFs with 62 % of the funds being active.[17] ITU lists twelve success factors for the management of USF. These include the legal and regulatory framework, policy articulation, autonomy and independence, consultation with stakeholders, delineation of responsibilities between USF and other government entities and external agencies, defined and measurable objectives, flexibility and neutrality in service deployment, fair and objective project allocation process, capacity building, sustainability and complementary services, innovations and incentives, visibility, accountability and transparency, and digital inclusion responsiveness.[18] The success of USF in each respective country is therefore dependent on how well these success factors are embraced and implemented.

Some countries like Nigeria, Ghana, Tanzania and South Africa have autonomous bodies that are independent of the regulator while other countries like Cameroon, the Democratic Republic of Congo, and Madagascar have the fund managed by the regulator.[19] Kenya has embraced a semi-autonomous body managed by the regulator, the Communication Authority. For instance, the success of USF in Nigeria is partly attributed to the board's autonomy, as the Board can undertake an in-depth examination of some performance issues and address this through a revamping or reorientation of the fund.[20]

Both Nigeria and Ghana's USF have clear strategic direction in terms of mission and vision compared to Kenya's USF which does not explicitly state its mission and Vision.[21] In addition, Nigeria has taken matters of inclusivity a notch higher by including social inclusion as one of its guiding principles, something that Kenya's USF guiding principles. In terms of services, while Kenya focuses on infrastructure and services, public institutions, capacity building, local content, special groups as key target consumers of USF,[22] Nigeria, known to be very active in implementing USF projects, has emergency services and community centres as additional beneficiaries of the fund.[23]

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17   Thakur, D. and Potter, L. (2018) Universal Service and Access Funds: An Untapped Resource to Close the
            Gender Digital Divide. Washington DC: Web Foundation.
18   ITU, 2013.Universal Service Fund and Digital Inclusion for all

19   ITU, 2013.Universal Service Fund and Digital Inclusion for all
20   GSMA,2014: Sub-Saharan Africa– Universal Service Fund study
21   https://www.uspf.gov.ng/about-uspf#mission
22   Kenya Information and Communication Act 2019
23   ITU, 2013.Universal Service Fund and Digital Inclusion for all

When it comes to dealing with multiple stakeholders, delineation of responsibilities between USF and other government entities and external agencies is critical as it leads to clarity in task execution. Therefore, guidelines and procedures for working with other government entities or other funding sources is paramount to achieve fund effectiveness. While USF in Kenya is yet to achieve this, South Africa presents a good example as it has a detailed USF operating manual where it defines and allocates responsibilities for key partners.[24]

Regarding digital inclusion responsiveness Ghana, rolled out projects in capacity building, awareness, content creation and coding for kids.[25] In addition to Rwanda and Benin, Ghana are among the few African countries that have invested in digital inclusion programs targeting women.[26] Among the achievements made in Ghana is the connection of one million two hundred thousand subscribers in beneficiary communities, an indicator that points towards Ghana Investment Fund For Electronic Communications (GIFECs) maturity in monitoring the impact of the fund.[27] The effectiveness of the funds can be assessed using how efficiently the funds are disbursed. For instance, while Nigeria, Côte d'Ivoire, Nigeria, Rwanda and Uganda had zero unspent funds by the end of 2016, most countries in Africa had quite some significant amount held in the banks. Kenya, for instance, had an estimate of forty-two million dollars unspent.

24   GSMA,2014: Sub-Saharan Africa– Universal Service Fund study
25   Asante, Abraham Kofi (2018). Sub-Saharan Africa– Universal Service Fund study: Closing the Digital Gap using Universal Service Funds – Key Lessons from Ghana Unpublished Presentation. GIFEC. http://1e8q3q16vyc81g8l3h 3md6q5f5e-wpengine.netdna-ssl.com/wp-content/uploads/2018/12/GIFEC.Closing-the-Digital-Gap-using-Universal-Service-Fund-Key-Lessons-from-Ghana.pdf
26   ibid
27   ibid

3.3. Measuring Use and Impact of Universal Service

Universal Service[28], characterised by ICT Services that are available, accessible and affordable - has been adopted as a policy goal in many countries. Some countries have established Universal Service Funds (USFs) on the premise that operators will not extend service to certain underserved areas without financial incentives. Many USFs remain inefficient and ineffective, with a lot of money waiting to be disbursed.[29] Similarly, many USFs are yet to distribute any of the levies collected and very few funds would appear to disburse everything they collected.

The concept of Universal Service is underpinned by the three following principles:

01

Availability:
users can access the service from anywhere, anytime and without geographical discrimination.

02

Affordability:
for all users, the price of the service should not be a factor that limits access.

03

Accessibility:
all service subscribers should be treated in a non-discriminatory manner with respect to the price, service and quality of the service, in all places, without distinction of race, sex, religion, etc.

The cost of providing universal service varies substantially between countries and is influenced by many factors including: -
* a country's demographic and geographical characteristics
* the efficiency and presence of existing operators
* the existing legal and regulatory framework (e.g., monopoly, liberalised)
* the 'universal' policy goal as applied in a particular jurisdiction.

Universal service programs may be examined in terms of inputs, outputs and outcomes. The outputs of universal-service programs may be seen in terms of necessary and sufficient conditions. The necessary condition is that the money, once collected, must be disbursed from the fund. The sufficient condition is that the disbursed funds must be spent as intended by the enabling legislation or regulations. The outcome of an effective universal service policy would be the number of people connected as a direct result of universal service subsidy programs, who would not otherwise be connected through market mechanisms.[30]

28   GSMA (2013). Survey of Universal Service Funds: Key Findings. Report prepared for GSMA by Ladcomm Corporation.
29   Rohan Samarajiva and Gayani Hurulle. Digital Policy, Regulation and Governance. VOL. 21 NO. 2 2019, Pp. 102-114. Emerald Publishing Limited, ISSN 2398-5038 DOI 10.1108/DPRG-07-2018-0035
30   Rohan Samarajiva and Gayani Hurulle. Digital Policy, Regulation and Governance. VOL. 21 NO. 2 2019, Pp. 102-114. Emerald Publishing Limited, ISSN 2398-5038 DOI 10.1108/DPRG-07-2018-0035

Scholars have identified a set of metrics that can be used to evaluate the performance and impact of the use of universal service funds.[31] These include; -

1. Funds held as a % of GDP

2. Fund balance when expressed as $ per rural population

3. Funds disbursed as a % of funds collected

4. Total disbursement rate (TDR)[32]
   Total disbursement rate$_t$ = (disbursement of funds / funds accumulated in USF$_{t-1}$) *100

5. Year-on-year disbursement rate (YDR)[33]
   Year -on -year disbursement rate$_t$ = (disbursement of funds$_t$ / inflow of funds$_{t-1}$) *100

6. Degree of autonomy and independence from political and other interference from government agencies; -
   - accountable to an impartial, credible party/authority
   - not subject to political interference
   - has clearly-defined governance and governance structure.

7. Metrics on training and education, maintenance, power sources and other sustainability concerns

8. Structured to be financially autonomous with projects awarded transparently through a public bidding process and implemented in a timely and transparent manner.

9. Level of coverage of funds when distributed across; -
   - Fixed-line
   - Wireless
   - Broadband

10. How well do USFs achieve coverage targets? Definition of coverage as measured by specific and well-articulated targets in the following indices; -
    - total number of villages/localities, municipalities, provincial capitals, etc.
    - number of districts, provinces or states served
    - number of telecentres
    - number of schools, libraries, health centres
    - number of payphones installed
    - number of base stations constructed
    - kilometres of fibre installed.

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31   ITU. (2013). Universal service funds and digital inclusion for all: Retrieved from https://www.itu.int/en/ITU-D/
        Digital-Inclusion/Pages/Digital_Inclusion_Resources/Universal_Service_Funds_Digital_Inclusion.aspx
32   ibid
33   ibid

3.4. Deepening Strategies

The ITU advocates for the need for a comprehensive and holistic approach to closing the digital divide by promoting digital inclusion. Against this background, the 2021 Access Gap study report recommended strategies for deepening usage as well as enhancing inclusivity in access to Voice and Data services. Among the recommendations made to address the challenges of PWDs and other special groups included tax exemptions for devices to PWDs, co-design of services with PWDs on board, customization of public e-platforms to cater for PWDs, content for PWDs, awareness programs for PWDs, and capacity building programs for PWDs. Concerning women, the same report recommended community networks and the creation of Public Access points as some initiatives that can be implemented to reduce the digital gender divide. Local content creation is seen as a stimulant for increased broadband use. Overall, the report recommended demand stimulation through capacity building and the creation of partnerships with relevant institutions.

3.5. Typologies of Monitoring

3.5.1. Thematic Monitoring

The National Broadband Strategy 2018 - 2023 suggested that thematic components monitoring required a robust MEL framework that monitored, measured and evaluated with clear timelines for deliverables. The framework has to create responsibilities to all implementing agencies and to ensure proper tracking of progress. Further, responsibilities for each thematic function have to be clearly defined and assigned to avoid ambiguity on whose responsibility results and outcomes fall during the implementation.[34]

USF MEL being implemented by different stakeholders and agencies within the value chain should embrace the use of thematic area MEL as a framework and equally provide a workable platform that allows multiple interactions with the monitoring system. The M&E function will be as below:

34   National Broadband Strategy 2018-23

Thematic Area	Projects	Intervention	Target	Timeline	Outcome
Infrastructure	Broadband	Connectivity to all gap areas	100% coverage	2025	Broadband is available to all citizen

3.5.2. Impact Monitoring

The World Bank[35] recommended the use of Performance Indicators to measure activities impacts, outcomes, outputs and inputs. Indicators monitor activities' implementation as they progress toward objectives. They are also used to evaluate an activity's success. Indicators organize information in a way that clarifies the relationships between outputs and inputs and help to identify problems along the way that can impede the achievement of goals.

Performance indicators can include the following indicators:

Results indicators track day-to-day operating results in terms of activities' outputs, deliverables and related results. These are results that can be directly attributed to the activity, such as the number of beneficiaries or officers trained, the number of laws drafted and adopted, the installation of computer networks, or increased revenues from services sold by business associations.

Impact indicators track the contribution of outputs to progress made toward achieving key business or economic goals. Impact indicators measure the broader economic impact of activities for the main purpose of assisting management to make strategic adjustments in programs. Impact indicators are also used to conduct impact assessments or evaluations of activities or their components, either at mid-term or at the end of an activity period.

Impact Evaluations or Assessments examine the broader impact of program activities, rather than simply tracking ongoing project operations, as in monitoring, or reviewing and adjusting strategies, as in evaluation. Instead, impact assessment goes beyond M&E to measure the wider effect of activities, usually at the mid-point or at the end of the activity period.

USF being an enabler for social-economic benefits, the MEL ought to embrace social impact indicators as a basis to measure social issues.

3.6. Feedback to stakeholders (Learning)

The Universal Fund, like the other financial mechanisms, is outcomes-based and does not finance projects for the mere sake of financing them. The Fund needs to get a "return" on its investment even if that return is social or socio-economic as opposed to financial. To achieve this, in addition to good governance, good project design, monitoring and evaluation are key. The Fund's role does not end at the allocation of monies – it must follow the projects, monitor them and evaluate them and report to the financiers.

The decisions made at that stage of project development have an impact on M&E. Needless to say, a well-designed project is easier to assess and have lessons learnt. Good design has the following critical components: -

01 **Measurable objectives** for the project, for which indicators can be defined

02 **A structured set of indicators**, covering outputs of network or services provided in terms of the project and their impact on identified beneficiaries

03 **Provisions for collecting data and managing project records** so that the data required for indicators are compatible with existing statistics, and available at a reasonable cost (where the funder is not the regulator this is one area where partnerships become useful since this will require coordination between the entities to get data from operators if not specified in the SLAs signed at project commencement)

04 **Institutional arrangements for gathering, analyzing and reporting project data, and for investing in capacity building**, to sustain the M&E service (where funds are separate from regulators this may require coordination between the entities to get data from operators)

USF should develop proposals on ways in which M&E findings will be fed back to stakeholders, financiers, and other affected parties. To identify appropriate indicators to track return on investment and impact, USF needs to consider:

- The target areas
- The target population/beneficiaries
- The specific services
- The kind of access
- The quality standards
- The content or applications to be affected?
- The specific awareness or knowledge to be developed.

With institutional sharing on what to be monitored which need to be included in SLAs such information would be obtained and monitored for analysis on the social-economic justification of the fund.

3.7. Monitoring Policies and frameworks

Two approaches to monitoring and evaluating the impact of USF policies may be considered and this include; -

01 Evaluation of the overall policies, and

02 evaluation of individual USF-supported projects. In both cases, the establishment of clear goals and/or milestones will lay the groundwork for later impact evaluation.

> The inclusion of specific goals or milestones allows a review of the efforts undertaken as a result of the policy.

For USF policies, governments should set specific, attainable goals for the key aspects of the policy. This could include, for example, ensuring Internet connectivity in a minimum number of locations or to a minimum percentage of the population, ensuring access to a certain level of connectivity without exceeding a certain proportion of per capita national income, and ensuring a minimum level of service quality. The inclusion of specific goals or milestones allows a review of the efforts undertaken as a result of the policy.

USF projects are implemented to realise some SDG, International, National and Local Policies. These projects may further be geared towards realising some level of achievement and goals. It is on this background that MEL will strive to ensure such policies objectives are tied to some indicator and outcomes.

3.8. Legal and Institutional Framework

Our literature review indicated that the enabling legal frameworks for USF funds should be well-conceived from the outset to allow effectiveness and no constraints. This conception should include, but is not limited to adequate oversight; technology-neutral and service-flexible; minimally bureaucratic – and is highly flexible with respect to effecting policy, structural and operational changes; allows the use of funds for ancillary/complementary purposes (but is still related); can easily adjust levies (in consultation with stakeholders) to accommodate actual (generally lower) funding requirements.

In addition to the above, there is a need to have an articulated strategy that details how the universal service will be achieved and organised, specified and measurable objectives that include coverage and service delivery targets. It is recommended that the following are observed; -
*   The strategy is prepared in consultation with industry and stakeholders;
*   That the strategy is presented in one or more easily-accessible information sites/media;
*   That the strategy demonstrates articulated measurement parameters that allow milestones and achievements (or lack thereof) to be demonstrated;
*   within the strategy, measurements and results reporting should be in a format to facilitate independent verification;
*   subject to annual review and adjustment in consultation with the stakeholders.
*   Programmes and targets established for the deployment of telecentres and community information centres taking into account issues related to training and education, maintenance, power sources and other sustainability concerns

Additionally, USF could also consider alternate solutions, such as the imposition of licence conditions on operators that enforce digital inclusion, the establishment of new plans or funds that are separate from the existing USF, and or private/public partnerships

Stern and Townsend (2006) further observed that there was a lack of detailed financial reporting (or the absence of any financial reporting whatsoever) from the majority of USFs, thereby obscuring transparency. Ideally, reporting should include; minimum of annual reporting on performance of fund (quarterly would be preferable) ; recap of any USF tenders held and results of same; overview of approved USF projects in progress (project description, coverage goals and timelines); performance of fund projects against targets with respect to coverage targets, project budget, timelines, etc; statistics and status on funds collected, funds disbursed as well as tabulation of remaining balance held in fund; explanation of any roadblocks/impediments/challenges encountered in disbursement of funds; annual public audit independent of government with results publicly reported and published; Guidelines and procedures for working with other funding sources (e.g., IFC, World Bank, NGOs, etc.); Clear definition and delineation of responsibilities between the USF and other government agencies/departments; Focus on ongoing sustainability (e.g., power supplies, backbone networks, education for users, etc.); Fair process to allocate subsidy – technology-neutral tenders to give all interested parties an equal chance to win (as opposed to mandating universal service); instead of direct and immediate reimbursement, provide incentives for efficient deployment and/or innovation and cost-minimization where feasible; 'Pay or play' where operators can choose if they want to participate; encourage Transmission technologies for local access and transport[36]; Financing Innovations for end users; innovative business and commercial practices for end users; Models and project pilot.

In addition to this, there was a need to address other common USF administration challenges. These are varied and could include, the underlying USF frameworks and rules that do not support or permit the use of the funds for the services required (e.g., wireless, broadband); inadequate or misguided articulation of fund strategy and objectives impeding effective administration; local conditions that impede or endanger full deployment of approved projects; absence of adequate primary infrastructure and facilities which will impede or preclude project deployment (e.g., accessible transmission backbone, road network, electricity etc); inefficient or excessively complex decision making, approval and governance processes; inadequate skill levels available for rural rollout and ongoing maintenance, sustainability; structural flaws in setting up the fund and its relationship with the various other institutional bodies involved in oversight or policy-making; lack of qualified and/or interested vendors to bid on USF projects; general managerial, operational and capacity issues.

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36   Peter Stern and David Townsend, 2006. New Models for Universal Access in Latin America. Report for Regulatel/World Bank (PPIAF)/ECLAC Project on Universal Access for Telecommunications in Latin America.

3.9. Inclusivity to PWDs and other minority persons

Persons with disabilities[37] (PWDs) are those who have "long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others". They face a range of physical, social, attitudinal and institutional barriers that prevent their full and effective participation in society on an equal basis with others. Common barriers include an inaccessible physical environment, including public transport, footpaths and buildings, inadequate legal and social protections, and stigma, prejudice and discrimination. As a result, PWDs experience poorer outcomes in health, education, employment, and housing.

The Convention on the Rights of Persons with Disabilities[38] (CRPD) recognizes that the challenges which PwDs face in participating fully in society are not necessarily because of their impairments, but are due to barriers that exist in a society that impede their participation. In this regard, the CRPD describes a disability as "an evolving concept".

The International Telecommunication Union (ITU), has a pivotal role in universal service policy and planning. In 2008, the ITU adopted as its theme "Connecting Persons with Disabilities: ICT Opportunities for All", to commemorate World Telecommunication Information Society Day (WTISD). This theme centred on the role that ICTs played in the economic participation and social wellbeing of PwDs.

a) Consider developing, within their national legal frameworks, guidelines or other mechanisms to enhance the accessibility, compatibility and usability of telecommunication/ ICT services, products and terminals, and to offer support to regional initiatives related to this issue;

b) Consider introducing appropriate telecommunication/ICT services and encourage the development of applications for telecommunication devices and products to enable persons with disabilities and persons with specific needs to utilize these services on an equal basis with others, and to promote international cooperation in this regard;

c) Participate actively in accessibility-related activities/studies in ITUR, ITU-T and ITU-D, including participating actively in the work of the study groups concerned, and encouraging and promoting representation by persons with disabilities to ensure that their experiences, views and opinions are taken into account;

d) Take into account the benefits of cost affordability for equipment and services for persons with disabilities, including universal design;

e) Encourage the international community to make voluntary contributions to the special trust fund set up by ITU to support activities relating to the implementation of this resolution;[39]

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37   Bleeker, "Using universal service funds to increase access to technology for persons with disabilities in the Caribbean", Studies and Perspectives series-ECLAC Subregional Headquarters for the Caribbean, No. 79 (LC/TS.2019/59-LC/CAR/TS.2019/2), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2019
38   Telecommunications Authority of Trinidad and Tobago 2019
39   https://www.itu.int/en/action/accessibility/Pages/ITUmandate.aspx

As an example, by using d) above, MEL should track the availability and access to "affordability for equipment and services for persons with disabilities, including universal design". It should be within the mandate of the regulator to ensure this has been realised and mechanisms to monitor it have been put in place.

According to Bleeker[40], the challenges related to projects for persons with disabilities included;

a) Terminology that fell short of CRPD standards
b) Lack of engagement with PWDs in project allocation and design processes
c) Lack of project proposals that targeted PWDs and their access needs
d) Lack of knowledge of disability organizations on available ICTs
e) The inability of disability organizations to apply for USF funding

40   A. Bleeker, "Using universal service funds to increase access to technology for persons with disabilities in the Caribbean", Studies and Perspectives series-ECLAC Subregional Headquarters for the Caribbean, No. 79 (LC/TS.2019/59-LC/CAR/TS.2019/2), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2019.

3.10. USF M&E Framework

The USF department has documented M&E framework for USF projects. It was developed to assist the department to ensure that the implementation of these projects is carried out as planned and achieves the aims and objectives to an acceptable quality, and within the planned period. In managing the projects, the Authority is required to undertake regular monitoring as well as period evaluation of the projects. This exercise is geared towards providing the Authority with the much-needed data and information on the projects. Broadly speaking the exercise is expected to
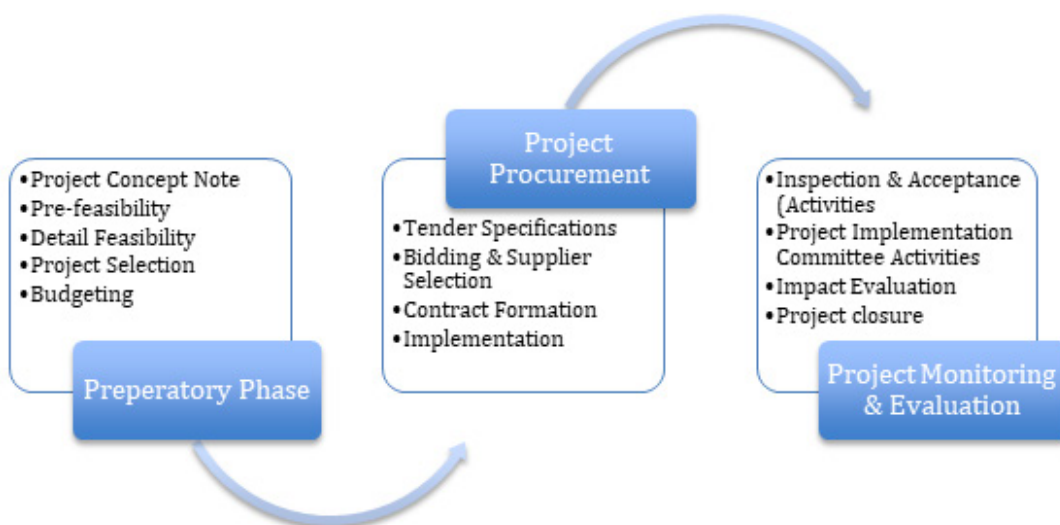
a) Track progress towards achieving specific objectives of the projects.
b) Measure impact of the USF Project especially the Voice Infrastructure Project
c) Increase accountability for the resources provided against the output
d) Inform decision making to reflect on lessons learnt for future implementation of similar initiatives
e) Build capacity for staff in the USF department and the regional offices through hands-on participation in the exercise

The framework has largely captured and adopted the process highlighted below:
a) Development of Monitoring and Evaluation Plan
b) Baseline Survey
c) Monitoring
d) Evaluation - Impact Assessment

Although, the actual process of monitoring and evaluation has inclined towards project procurement, rollout, and acceptance of sites. Any further field visits will be inclined towards gap areas assessments and special projects. Other social-economical and thematic components of the projects are not covered in the visits which expose the projects to not being holistic in solutions provided to the communities.

Figure 1: USF Project Cycle Visualization

• Project Concept Note
• Pre-feasibility
• Detail Feasibility
• Project Selection
• Budgeting

Preperatory Phase

Project Procurement

• Tender Specifications
• Bidding & Supplier Selection
• Contract Formation
• Implementation

• Inspection & Acceptance (Activities
• Project Implementation Committee Activities
• Impact Evaluation
• Project closure

Project Monitoring & Evaluation

4. Research Methodology

4.1. Choice of research design

We adopted a participatory consultative approach that allowed active participation of all key stakeholders. This ensured a user-friendly environment for participants to freely express their opinions regarding issues being researched and allowed two-way learning and flow of ideas. The research adopted a multi-method research design and as such a partially mixed concurrent equal status design (PMCESD)[41] was employed as the anchor design. In this case, both quantitative and qualitative data was obtained. Subsequently, the analysis and triangulation of data from the two sources enhanced the significance of the findings and recommendations. PMCESD fits into the traditional social behavioural research (SBR) which has an established rigour that is accepted among the academic fraternity. Limitations that include representation, legitimation, integration, and acceptability which are common in mixed-method research[42] were overcome through a series of a priori determined steps and measures that included approval of the tools by the clients, application of replication and logic models, continuous review of rival explanations as well as the establishment of a chain of evidence.

To facilitate the development of the deepening strategies and the development of a monitoring, evaluation and learning framework, the human-centred design was incorporated in the approach. PMCESD differs significantly from the Human-centred design (HCD) in areas like participant's recruitment, overall objectives, data analysis, and synthesis of findings. Despite the differences, HCD can be used to supplement the outcomes of SBR as there are synergies envisaged between the two design approaches[43]. Thus, the results from HCD were only used to provide additional insights that enhanced the development of innovative strategies to deepen Voice and data usage among the marginalized communities. In addition to this, human-centred allowed the participation and iterative interrogation of the findings and the derived recommendations were used. HCD, as a practical and iterative process for problem-solving, drew upon lived experiences, recognizing that various perspectives, most importantly those of the end-user, were useful in crafting solutions.

A strong component of the application of this process was the development phase, which was rolled out using the co-creation principles. We sought to co-create with our users and their stakeholders, rather than simply delivering insights to them. Table 1 presents how each key research question was addressed and the methods used.

41   Leech, N. L. & Onwuegbuzie, A. J. (2009). A typology of mixed methods research designs. Quality & Quantity, 43, 265-275.

42   Onwuegbuzie, A.J. & Collins, K.M. (2007). A Typology of Mixed Methods Sampling Designs in Social Science Research. The Qualitative Report. 12 (2), 281-316. https://doi.org/10.46743/2160-3715/2007.1638

43   Tolley, EB. (2017). Traditional Socio-Behavioral Research and Human-Centered Design: Similarities, Unique Contributions and Synergies.

Adopted Approach

	KEY RESEARCH QUESTION	ADOPTED APPROACH
1	**Evaluate Use and impact:** To provide an overview of the status of the USF and the roll-out of the services so far	Descriptive / Human Centred Design
2	**Develop Strategies for deepening use:** How can digital use be further deepened in bridging digital gaps and further determine usage deepening strategies that can accelerate Kenya's digital inclusion.	Explanatory/ Human Centred Design
3	**Developing an effective Monitoring, Evaluation and Learning (MEL) framework**: USF and partners to track inputs, outputs and impact to provide an accountable and transparent system of reporting progress	Human-Centred Design

4.2. Data and information requirements

4.2.1. Research Tools

A combination of interview guides and questionnaires were used and are presented in Appendix 10.5 as an attachment. In arriving at the different tools, various considerations that pertain to the validity and reliability of the instrument were considered and these are presented in Table 2.

Table 2: Addressing Tool Validity and Reliability

TEST	TACTIC	THE STAGE AT WHICH TACTIC WILL OCCUR
Construct Validity	• Approval by the clients of the instruments and tools • Multiple sources of evidence • Given the diverse languages in the counties, key terms in the assessment tools were identified and translated to local dialects before the administration of tools to ensure common understanding and consistency of responses. • Establish a chain of evidence • Respondents to review interview transcripts where applicable	Inception feedback Research design Data Collection
Internal Validity for qualitative interviews	• Pattern matching • Explanation building • Address rival explanations • Use of logic models	Data collection Data Analysis
Internal Validity for quantitative interviews	• Post-interview first-level analysis at the back end.	Data Analysis
External Validity	• Use of replication logic • Prompt review of completed forms by respondents was done by consultants.	Data collection
Reliability	• Development of the various tools followed the internationally peer-reviewed and accepted standards • Approval by the client of the tools • Use of approved instruments and tools • Instruments were pre-tested before the administration • Rigorous training of the research team on the proper application of the tools and their full understanding of indicators and variables of interest	Inception feedback Research Design Data Collection

4.2.2.   Data Collection Methods

The evaluation also employed both quantitative and qualitative methods of data collection that included key informant interviews (KIIs), focus group discussions (FGDs). These interviews were iterative and led to a human-centred design of the outcomes. A multi-stage stratified sampling process was adopted. In the first stage and to ensure that all geographical areas are adequately represented in arriving at the sample of participants for both quantitative and qualitative components of the research, all 15 counties were included in the sampling frame with the research carried out in 40 sub-locations that were spread out across the counties. These units formed 53% of the 75 sub-locations that were completed as part of Phase I of the USF Voice Infrastructure. A list of the 40 sub-locations appears in Appendix 10.3.

Subsequently, a combination of probability and non-probability sampling scheme was adopted. The main guiding factors were respondents who have been exposed through knowledge or action to both voice and data services. In other words, they must have previously used a phone or a digital device. Therefore, a combination of purposive, relational and random sampling approach was adopted for the survey. Purposive and relational sampling was mostly used in KIIs, Specific User Cases, FGDs. Random sampling was mostly used during the end-user surveys. However, in some end-user surveys, we purposely searched and incorporated the special interest groups.

For purposes of providing clarity, we present in the next sections, the data collection methods that were used in greater detail.

4.2.2.1.   Secondary Data Review

A detailed review of the relevant documents from various sources including CA, DAP and its partners, other relevant government institutions, and the entire ICT sector was conducted. The purpose of the secondary data review was to establish an empirical baseline based on previous studies. A detailed document checklist was developed and used with all documents to glean information. The literature reviewed is listed in the list of references.

4.2.2.2.   Key Informant Interviews

To gather in-depth information from the respondents, key informant interviews (KIIs) were conducted with key stakeholders in all the 15 counties and in the selected 40 sub-locations that we carried out the survey. A combination of unstructured and structured interviews was conducted with the various stakeholders. A total of 93 interviews were conducted. Informant Unstructured interviews allowed preliminary issues to be brought to the fore thereby allowing the researchers to determine areas that need further emphasis during the FGDs and user surveys. Thereafter structured interviews were used for the detailed KIIs and FGDs. The selection of the respondents was purposeful, relational and replication-based. A combination of face to face and telephone interviews were adopted.

The respondents for KIIs were determined based on their roles. The respondents were therefore purposively and relationally selected. The number and distribution of KIIs interviewed are shown in Table 3.

Table 3: Sectoral Details of Respondents

COUNTY	NGAO	HEALTH	EDUCATION	OTHERS
Baringo	3	1	1	2
Bungoma	5	-	2	5
Garissa	2	1	1	-
Isiolo	2	1	2	-
Kajiado	1	2	2	-
Kilifi	3	1	2	1
Kitui	1	-	2	-
Kwale	1	1	1	-
Mandera	3	1	1	-
Marsabit	1	1	1	-
Narok	4	3	2	5
Samburu	2	1	2	1
Turkana	4	2	2	4
Wajir	7	4	4	-
West Pokot	2	1	1	-

Replication logic was used to determine the level of saturation of the data obtained in all the instances in the sub-locations to determine whether or not to continue looking for additional respondents.
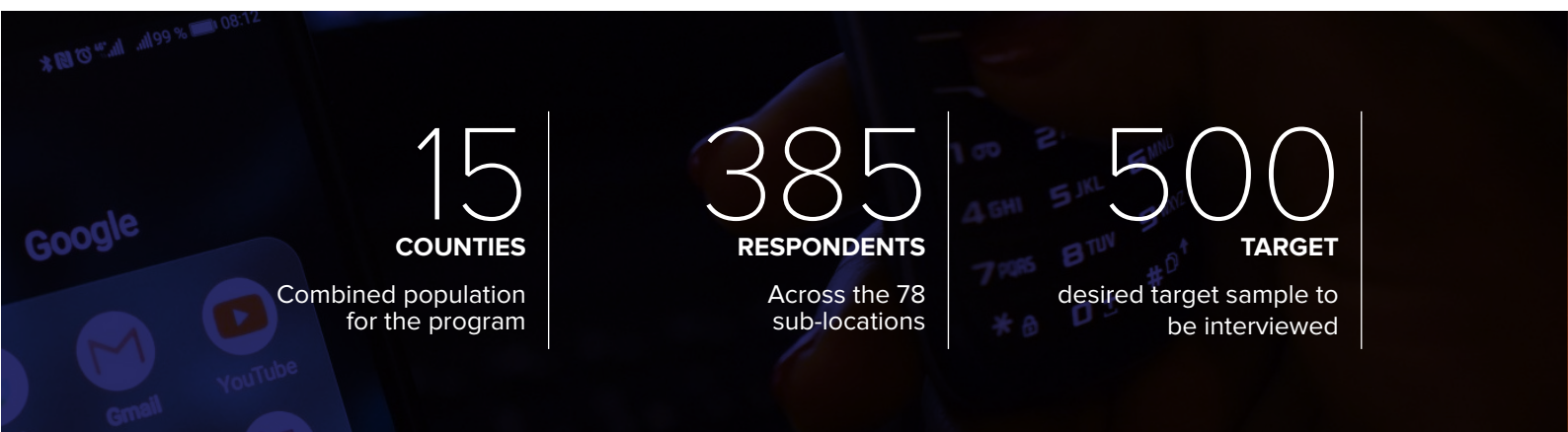
4.2.2.3.   Focus Group Discussions

We carried out 14 FGD discussions in 13 counties and the list and location where the discussions took place are provided in the Appendix. The criteria for participation in the FGD was determined after having engaged closely with local NGAO administration to ensure a balance and included women, PWDs, Youth and disadvantaged individuals to meaningfully contribute to the discussion. The discussions were physical and as such the Ministry of Health guidelines on Covid 19 protocols were adopted on a best effort basis. Each FGD comprised 6-15 members.[44] Each of the FGDs was moderated by one of the consultants with the assistance of a research assistant as a note-taker. A standardised guide was used. On a best effort basis, English and Swahili were used as the language of communication, however, there were numerous instances when local dialects were used leading to a need for local translation services.

A total of 14 FGDs across 13 counties were carried out. Purposive sampling of respondents for FGDs was done. The selection of 6-15 discussants ensured a balance between gender and age and any other disadvantaged groups. Except for Mandera and West Pokot, one FGD was carried out in each county. In addition to this, Turkana County had 2 FGDs, bringing a total of 14 FGDs.

44   Guest, G., Namey, E., & McKenna, K. (2017). How many focus groups are enough? Building an evidence base for nonprobability sample sizes. Field Methods, 29(1), 3–22. https://doi.org/10.1177/1525822X16639015.

15	385	500
COUNTIES	**RESPONDENTS**	**TARGET**
Combined population for the program	Across the 78 sub-locations	desired target sample to be interviewed

4.2.2.4.   End User survey

At the second stage of sampling, a stratified random sampling scheme was used to determine the respondents for the cross-sectional survey. The unit of analysis was deemed to be the end-user in the sub-location. The combined population for the program in the 15 countries was 12 million according to the 2019 Population Census.[45] However, the Communications Authority estimates the affected population across the 78 sub-locations as 377,107. Hence, substituting the above into Cochran's formula, a minimum of 385 rC were to be targeted for interview.

During this second stage of sampling, the sampled respondents were proportionately distributed based on the population with higher populated areas having more respondents in each of the 40 sub-locations. Further to this, the allocated proportion per sub-location was stratified based on the special interest groups being purposefully included in the sample. The number of actual respondents in each of the sub-locations is presented in Appendix 10.2. A total of 498 respondents were interviewed against the desired target sample of 500.

45   KNBS, 2019. 2019 Kenya Population and Housing Census. Kenya National Bureau of Statistics. Republic of Kenya.

A user/beneficiary survey questionnaire was used for the data collection from USF project beneficiaries. The survey questionnaires were administered by research assistants. To be eligible as a respondent for the survey, one must have previously owned or operated a mobile/digital device. The questionnaire was pre-tested at the initial stages of the survey before its full administration. The number of respondents for the survey was pre-determined based on a multistage random sampling formula that was based on the population in the unit research area. Before a survey administration, the enumerator explained the purpose. A Total of 498 responses were collected leading to a data collection success rate of 99.6%.

The survey was also geared towards uncovering possible obstacles and drivers to the adoption of digital solutions. Traditional research provides a meaningful starting point for problem identification but does very little to tell us about the underlying behavioural drivers – the inherent motivators or demotivators – which are far more powerful at influencing the way people act, interact and make decisions. As such, Human-centred design was incorporated during the KIIs and FGDs to flush out the other factors and to develop key pathways that will support systemic interventions to deepen usage of digital services, including Voice and data.

4.2.2.5.   Self-Administered Surveys

In addition to this, self-administered surveys were done mainly by MNOs, Tower companies (Towercos), Fixed Network operators, DAP partners and other key stakeholders in the ICT sector. A total of 18 responses were received.

In addition to the KIIs, some respondents preferred self-administered surveys. These mostly included Mobile network operators and the DAP partners.

Table 4: Self Completed Surveys and Informant Interviews with Digital Access Partners

	CATEGORY OF RESPONDENT	NUMBER
1	Communications Authority Staff	5
2	DAP country implementing partners	6
3	Internet Service Providers/ Fixed network operators	2
4	Mobile network operators/Internet service providers	3
5	Towercos	2

4.3. Data Management and Analysis

Online Data Kit (ODK) software was used to aggregate the responses from all locations. Appropriate computer software will be utilised for purposes of survey execution and data management. The computerised software was selected based on their quality assurance features (e.g., start and interview end time; geocode of the interview location, and capability to collect data offline and upload at a later time when the Internet was available). The data obtained was subsequently downloaded to an excel format which was then uploaded to Statistical Package for the Social Sciences (SPSS Version 21) for further analysis of the quantitative data obtained from the end-user survey.

The KII and FGD responses were typed out into transcripts and analysed. Thematic content analysis was accomplished in three major steps. First, FGD and KII responses were organized into topical areas through independent coding by members of the research team. Subsequently, by constantly comparing each code with the preceding ones to avoid redundancy, we aggregated codes that contained statements similar in content to form themes. Thereafter, we computed theme frequencies, that is, the number of times a theme emerged in an FGD or KII, expressed as a percentage of the total number of FGDs or KIIs. A modification of Wao et al's conceptualization of theme frequency which is based on the actual number of participants was used to determine how frequency effect size is measured.[46] By

computing theme frequency data we were able to gather more information from the qualitative data and triangulate it with quantitative data thus enhancing the credibility of our evaluation findings. This formed the basis for the qualitative data that was used to supplement the findings from the available and collected quantitative data. The Mural collaborative software was used to enhance the discussions amongst the team members.

The findings from the study were integrated in a hierarchical yet iterative manner. This is shown in Appendix 10.4. The starting point for the study was the review of the secondary and documented data on USF project achievements and its related publications. This review generated some findings that led to the development of tools for data collection. The end-user survey provided base case quantitative information – which answered the "what" questions. The KIIs provide deeper insights that sought to answer the "how" and the "why" questions. The qualitative findings obtained through a thematic analysis of FGDs also provided answers to the "what if" questions thus providing alternative and interactive views to the findings that were earlier obtained. Through human-centred design, strategies for deepening usage were muted by integrating experience, expertise and the insights gleaned from desk reviews and in-depth interviews into a set of concise recommendations developed from the insights from user surveys for digital inclusion.

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46   Wao, H., Dedrick, R. F., & Ferron, J. M. (2011). Quantitizing text: using theme frequency and theme intensity to describe factors influencing time-to-doctorate. Quality & Quantity, 45, 923-934.

The consultants ensured that the quality of data was maintained through the following ways:

a) Use of reliable sources of information, corroboration with the client and cross-referenced with other credible sources;

b) the development and use of the effective data collection tools and methods for analysis to ensure reliable findings;

c) inbuilt data quality checks in the database;

d) rigorous training of the research team to ensure that they were fully conversant with the use of tools;

e) pretesting and review of the data collection tools based on the results of the pretest;

f) the research team and supervisors validated each completed data collection tool daily to ensure that corrections were made while still in the field;

g) regular de-briefing among the research team was done to share experiences and chart out future strategies.

5. Conclusion

Our research has shown that value has been derived from the deployed Voice and Data USF services across the 75 sub locations that benefited in Phase 1 projects. We have however been able to demonstrate that the three pillars of USF Projects need to go beyond network infrastructure. From our research, we can conclude that the perception of accessibility, availability and affordability is mixed.

As a result of this, there has been disparate utilisation of universal services across areas of connectivity, affordability, attainability, awareness, locally relevant content, skills, government services, safety, security, trust and resilience. Our research has also demonstrated that this impact was disaggregated across different factors including counties, age groups, gender, PWD, and other categories of excluded populations. It shows that there are substantial areas of opportunity in providing access to universal services to the excluded population. The usage for USF projects was accelerated by the needs that were identified. The digitally marginalised areas suffer from lack of physical infrastructure, challenges of social security as well as limited opportunities for livelihood. Universal service provides solutions to enhance the livelihood of the people in these areas.

Through integration of various data sources and application of Human-centred design we have proposed several strategies to deepen usage across different groups among the beneficiary communities. These solutions are tailor made to address the elderly men and the uneducated youth, women, persons living with disabilities, and tech-savvy youth. Besides, strategies are proposed to address the role of complementary services in deepening usage and impact.

Information and data from literature review, stakeholder engagement, and analysis of findings has been collated to develop a new monitoring, evaluation and learning framework that will be used by various stakeholders to enhance the deployment, outcome and impact of USF services.

It shows that there are substantial areas of opportunity in providing access to universal services to the excluded population. The usage for USF projects was accelerated by the needs that were identified.
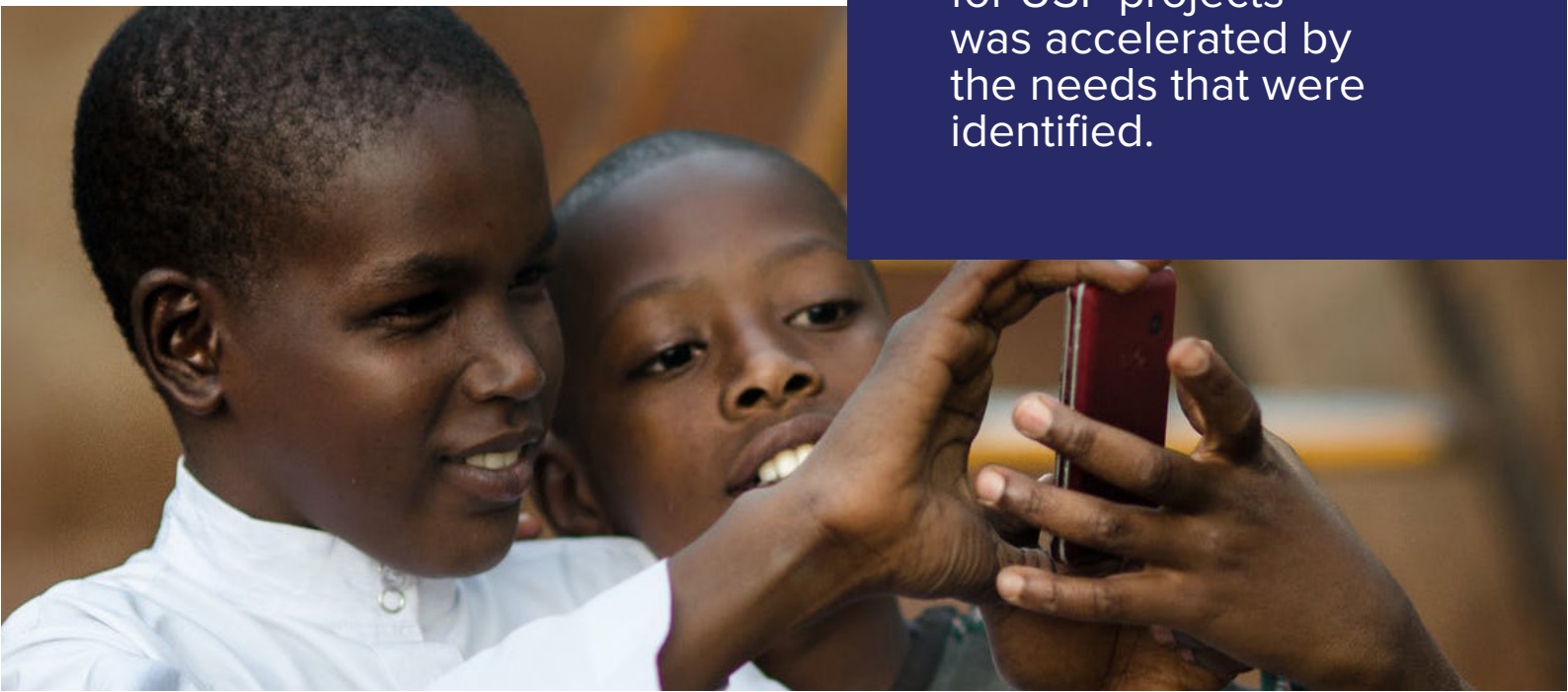
Part II: Study Outcome

Research Synthesis, Findings and Recommendations

Availability

the level of service is the same for all users in their place of work or residence, at all times and without geographical discrimination.

Affordability

for all users, the price of the service should not be a factor that limits service access.

Accessibility

all telephone subscribers should be treated in a non-discriminatory manner with respect to the price, service and quality of the service, in all places, without distinction of race, sex, religion, etc.

The concept of universal service is underpinned by the three following principles;

What is our goal?

Project Outcomes

01
Use and impact:
This will provide an overview of the status of the USF, and the rollout of the services so far

**02**
Strategies for deepening use:
How can use be further deepened in bridging digital gaps and further determine usage deepening strategies that can accelerate Kenya's digital inclusion.

03
Developing an effective Monitoring, Evaluation and Learning (MEL) framework:
USF and partners to track inputs, outputs and impact to provide an accountable and transparent system of reporting progress:

Research
Design

Quantitative Data

Partially Mixed Concurrent Equal Status
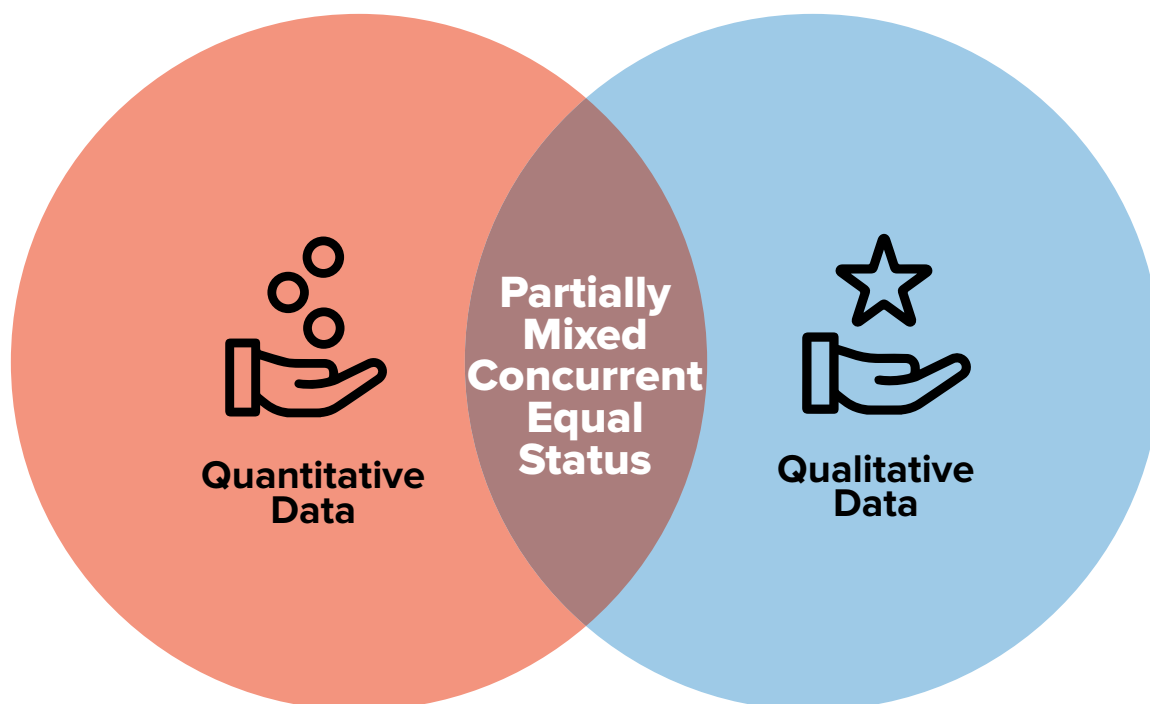
Qualitative Data

Our Research adopted a Human Centred Design framework to enhance assessment and design strategies

Research Analysis
& Synthesis Approach

Data Collection, Collation & cleaning
- Data Collation

Quantitative Data analysis
- Desk Analysis

HCD data Synthesis
- Literature review
- Expert interviews and storytelling (building empathy)
- Brain writing and data synthesis
- User journey mapping
- Affinity mapping
- Ideation and concepting

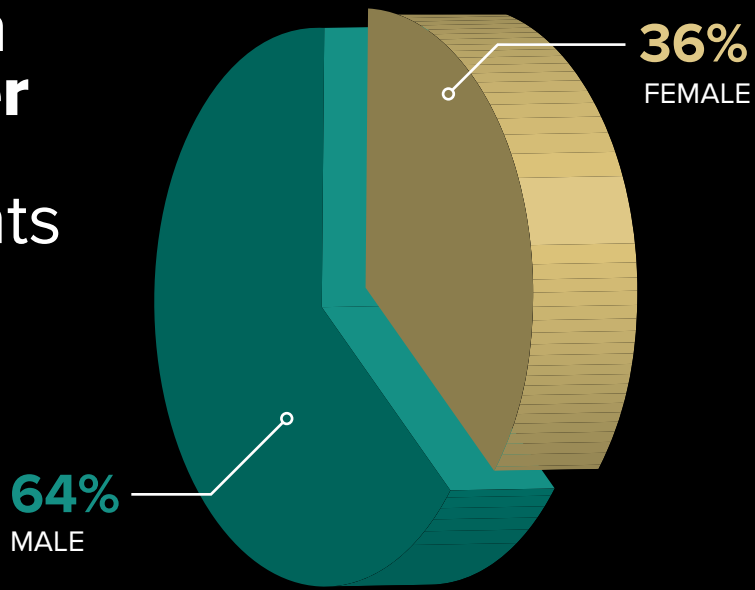**Ideation & strategic recommendations**
- Desk Analysis

Distribution of **End User Respondents** across counties

- Adopted a balanced approach
- 15 counties
- In addition to the end user surveys, KIIs
- 41 NGAO
- 62 Other sectoral respondents
- 14 Focus Group Discussions of averagely between 6-15 attendees.
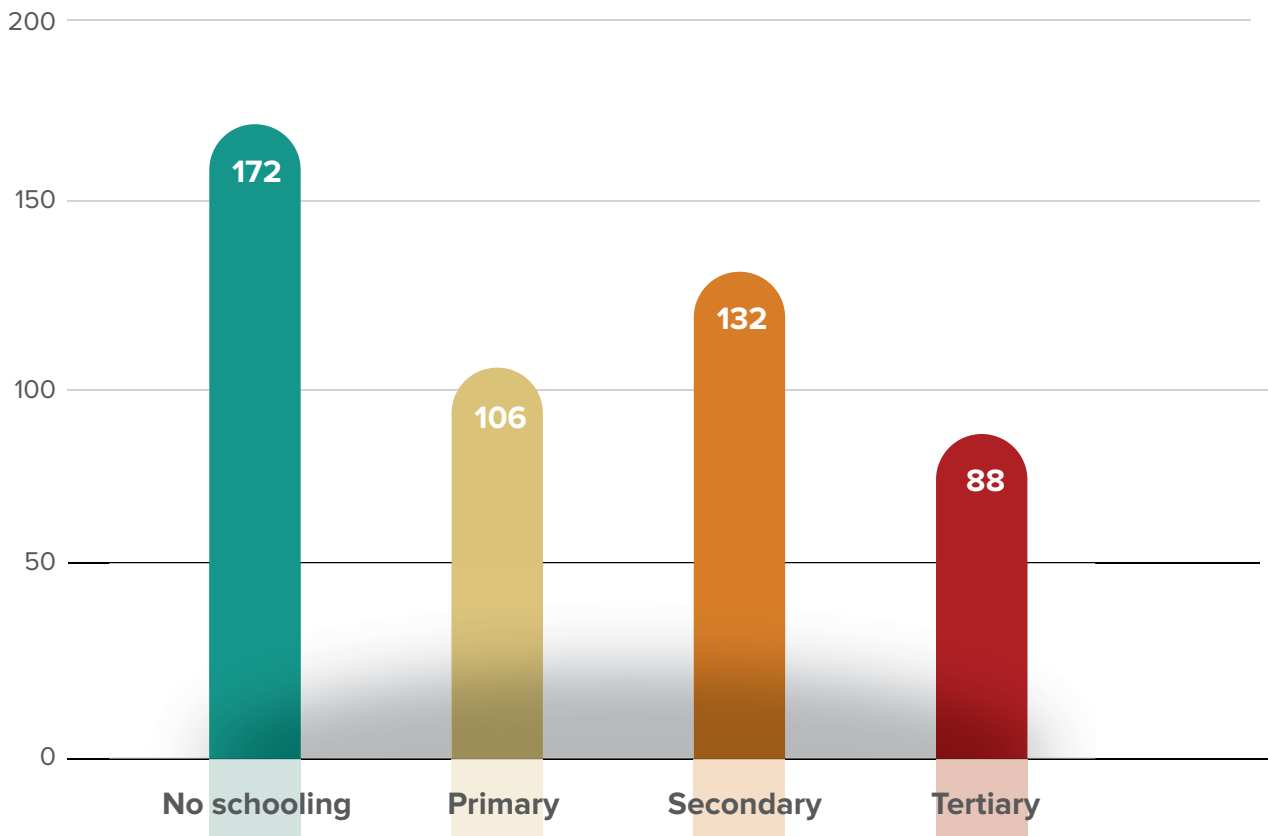- Human Centred Design was applied during KII and FGD

Mandera
51 | 10.2%

Marsabit
30 | 6%

Turkana
92 | 18.5%

West Pokot
7 | 1.4%

Samburu
15 | 3.0%

Wajir
112 | 22.5%

Isiolo
11 | 2.2%

Bungoma
34 | 6.8%

Baringo
11 | 2.2%

Garissa
5 | 1.5%

Narok
30 | 6.0%

Kitui
15 | 3.0%

Kajiado
30 | 6.0%

Kilifi
11 | 2.2%

Kwale
47 | 9.4%

Distribution of **End User Survey** Respondents

- Ownership of devices
- Cultural norms determining visibility and availability

36%
FEMALE

**64%**
MALE

End User Survey Respondents
Highest Educational Level

Level	Count
No schooling	172
Primary	106
Secondary	132
Tertiary	88

200
150
100
50
0

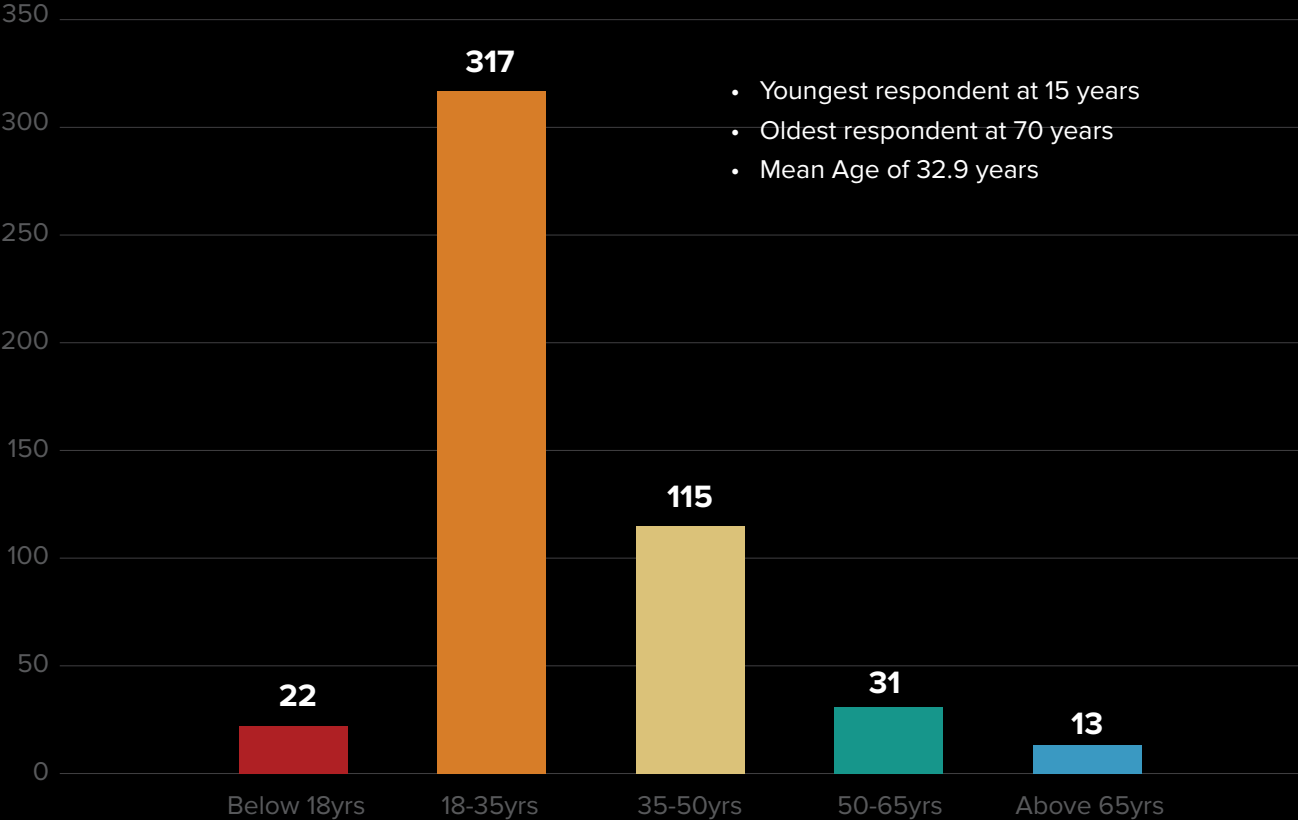No schooling   Primary   Secondary   Tertiary

- Representative of marginalised communities in terms of access to education

End Use Survey - **Disability Status**

- Types of disabilities encountered;-
    - Blind
    - Hunchbacks
    - Limbs
    - Deaf and dumb
    - Crippled
    - Spinal injury
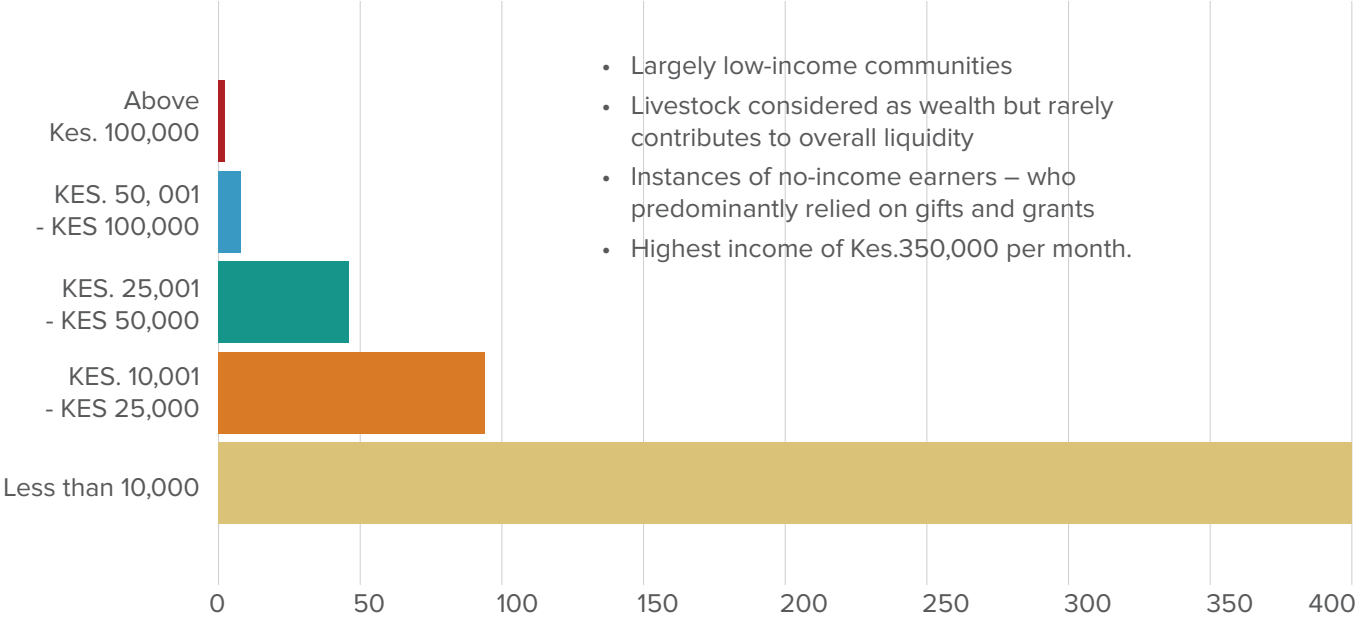- Compares to 5% estimated at country level

6%
YES

94%
NO
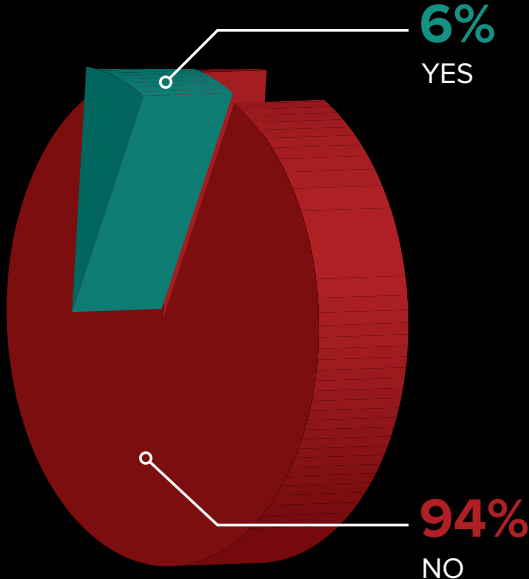
End User Survey **Age Distribution**

- Youngest respondent at 15 years
- Oldest respondent at 70 years
- Mean Age of 32.9 years

Age group	Count
Below 18yrs	22
18-35yrs	317
35-50yrs	115
50-65yrs	31
Above 65yrs	13

End User Survey
Income Distribution

Income categories (bar chart):
- Above Kes. 100,000
- KES. 50,001 - KES 100,000
- KES. 25,001 - KES 50,000
- KES. 10,001 - KES 25,000
- Less than 10,000

Chart x-axis: 0, 50, 100, 150, 200, 250, 300, 350, 400

- Largely low-income communities
- Livestock considered as wealth but rarely contributes to overall liquidity
- Instances of no-income earners – who predominantly relied on gifts and grants
- Highest income of Kes.350,000 per month.

# Perceived **Network Coverage**

- Pockets of lower network coverage
- Main use for phone coverage include;-
    - Communication
    - Social media
    - Gaming
    - Remittances
    - Radio
    - Torch and other phone functionalities

2G **20.9**%

3G **44.0**%

4G **35.1**%
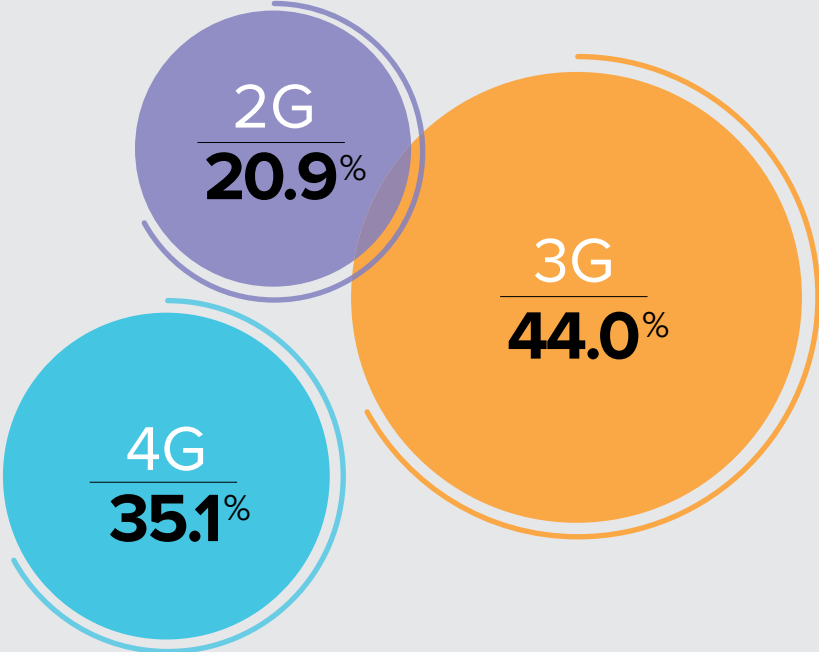
General **Level of Satisfaction** with Mobile/ Digital Services

Cocktail of reasons that are attributed to;-
- Network accessibility
- Affordability
- Convenience
- Ease of use

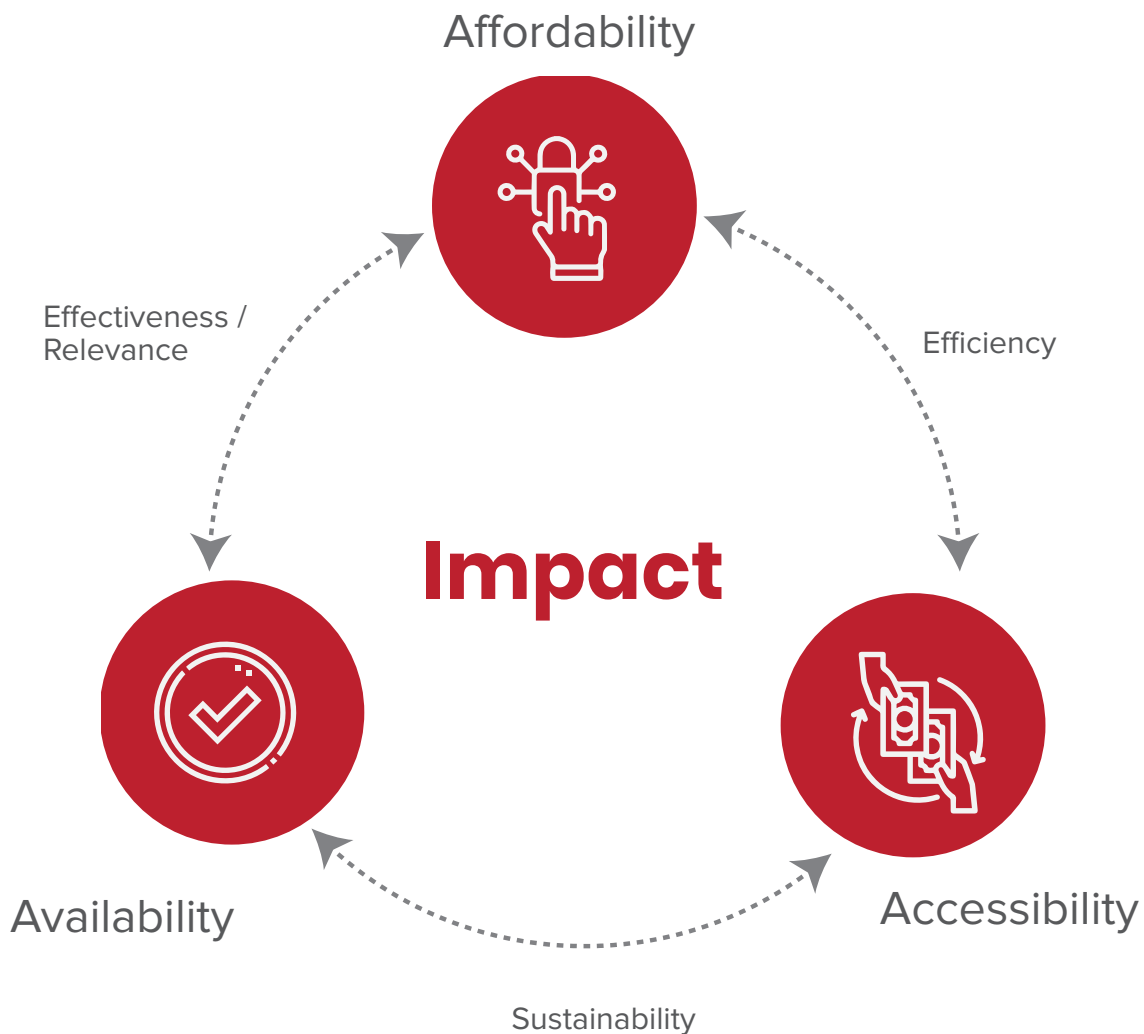**Recent changes experienced in;**
- Speeds
- Clarity

11%

1%

22%

15%

51%
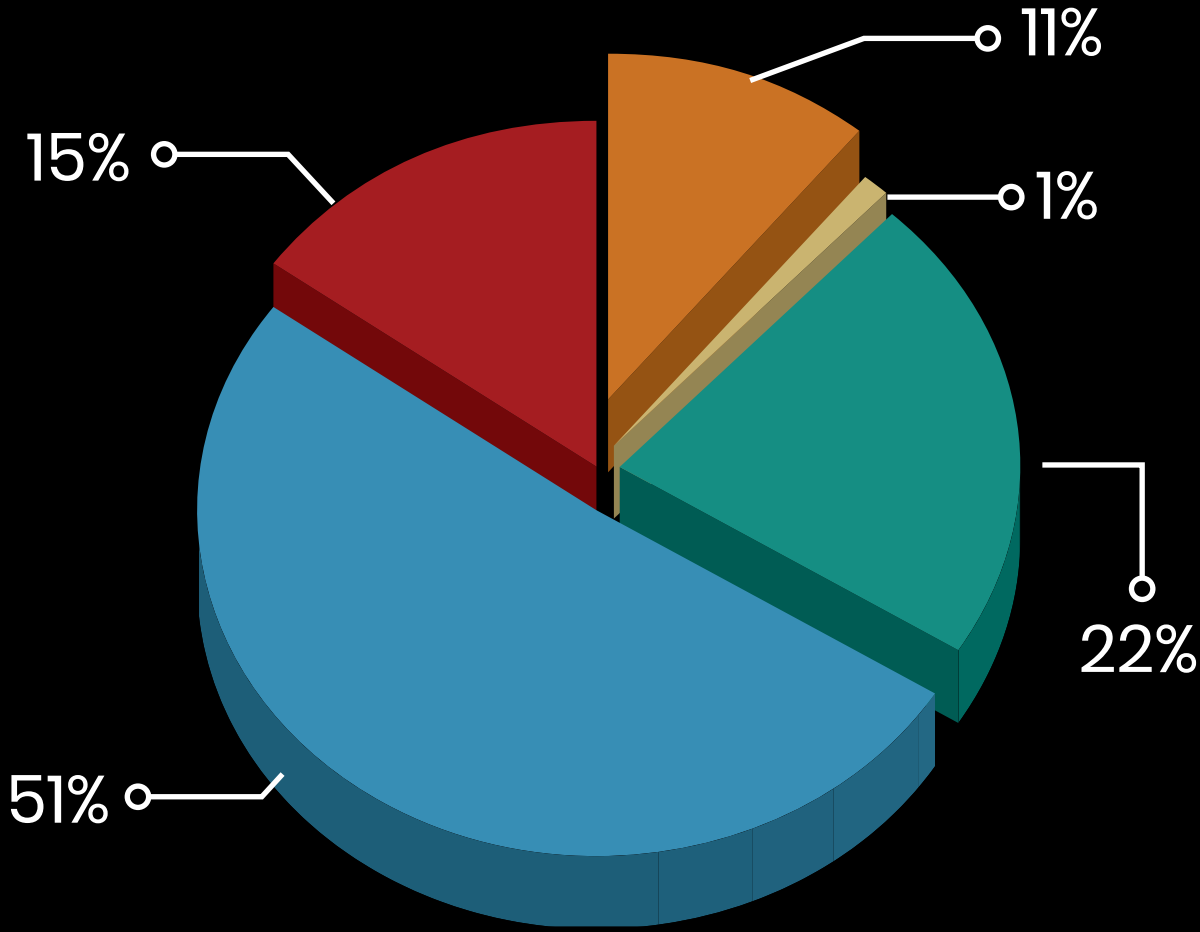
Recent changes experienced in;
- Speeds
- Clarity

Appreciation on the following areas;-
- Additional infrastructures
- Public Services
- eCommerce opportunities
- Gaming and other entertainment
- Source of information
- Enhanced physical security

■ Satisfied	■ Very Satisfied	■ Very Dissatisfied
■ Dissatisfied	■ Neutral	

Analysing the experience to determine the **use & impact.**

- **Detailed feedback on multiple Likert scale analysis**
- **Emerging needs on use of technology**
- **Impact of Covid 19 in accelerating the adoption of technology**

Affordability

Effectiveness / Relevance

Efficiency

Impact

Availability

Accessibility

Sustainability

Towards an **objective measure**

- Adapting the Likert Type Scale
  - Ranging from very agreeable/familiar (positive) to very disagreeable /unfamiliar (negative)
- Responses consolidated and categorised based on positive responses as compared to negative responses
- Each category of score is then worked out as a proportion of the overall sum
- For each statement, an average value determining the extent of skewness is derived.
- A simple average is then derived for each category of statement... Average Perception Score
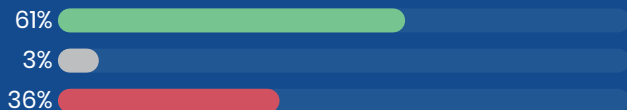
Accessibility of Digital Mobile Services

Public services through Huduma Centres have been enhanced.

- 11%
- 11%
- 78%

I am familiar about On-line meetings.

- 27%
- 9%
- 64%

An adequate digital entrepreneurial ecosystem that included access to cyber cafes and other centres has been developed in a manner that is beneficial to the local community

- 28%
- 8%
- 71%

I now have an easy access to computers in my locality.

- 18%
- 11%
- 70%

I am familiar about social media applications for instance for instance WhatsApp, Facebook, LinkedIn, Instagram, WeChat, Twitter, etc

- 61%
- 3%
- 36%

As a result of digital access have an easy and reliable access to information

- 62%
- 10%
- 27%

I am familiar about Online betting

- 38%
- 10%
- 52%

As a result of digital access, I now have an environment that is conducive and interactive for information/work

- 46%
- 14%
- 39%

I am familiar about entertainment like football, music, movies, YouTube.

- 64%
- 3%
- 33%

Digital access has enabled the creation of ICT content and its applications in my location

- 21%
- 15%
- 64%

I am familiar about Job search/application e.g. Ajira, Brighter Monday

- 33%
- 9%
- 58%

Digital access in my location has improved the Quality of education and life in my community

- 47%
- 15%
- 38%

Availability of digital/mobile services

Digital access in my location has increased computer literacy level in my level in my society

29%
15%
56%

There has been an enhanced and improved fast internet speeds.

42%
15%
43%

Digital access has transformed my community into a knowledge-based society

43%
10%
47%

I am happy about the ease of use of digital services

77%
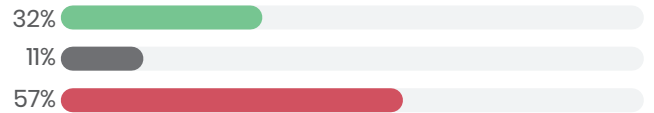0%
23%

In my view, there is clear network in my area

85%
0%
15%

Average Perception Score (APS)

43%
9%
48%

There are now additional network boosters in my location.

32%
11%
57%

I am aware of the existence of public service activities in education like Digi schools which have improved access to technology in my community
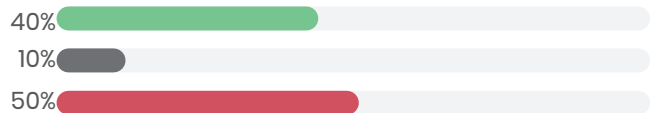
19%
9%
72%

I am aware of the existence of public service activities in health like Jitengee, Damusasa and others which have improved access to technology in my community.

8%
9%
83%

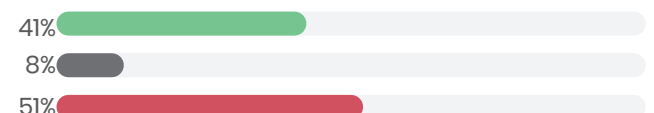My area has 2G/3G/4G/5G network coverage

69%
9%
28%
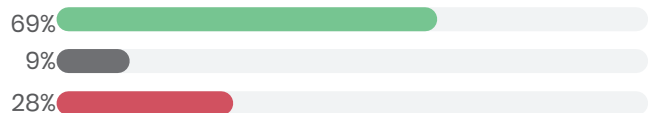
Recently, there has been expanded mobile telephone network in many areas in my location

40%
10%
50%

My perception on the availability of network

87%
0%
13%

Average Perception Score (APS)

41%
8%
51%

Impact on digital/mobile services

Public services through Huduma Centres have been enhanced

11%
11%
78%

Change or improvement of Quantity of food, cash, incomes in my household.

36%
23%
40%

Increase of productivity as a result of the integration of mobile technology into my working space which includes eCommerce as well as source of production knowledge

32%
20%
47%

Awareness of employment opportunities.

40%
17%
43%

Improved access to markets, extension workers training and services, veterinary services, legal advisor services

36%
16%
47%

Improved access to formal/ informal financial services (e.g. savings, credit and insurance)

36%
16%
47%

Awareness of advocacy interventions (community, local and national level) to allow equal rights, access and opportunities in livelihoods
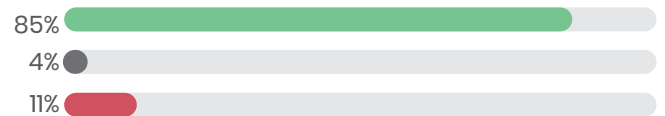
27%
12%
61%

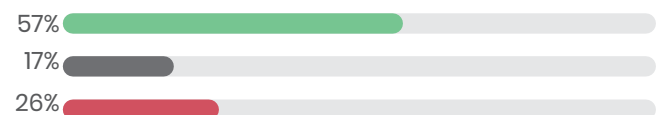**Average Perception Score (APS)**

27%
12%
61%
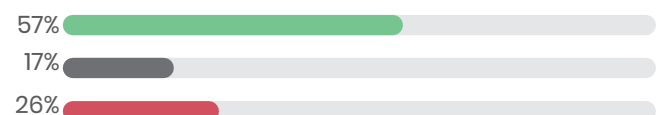
Sustainability
of digital/mobile services

I will continue using internet and data access to improve my livelihood.

85%
4%
11%

During the Covid 19 pandemic, I have been able to adopt and change my livelihood using digital access

57%
17%
26%

Average Perception Score (APS)

57%
17%
26%

Affordability of digital/mobile services

Use of E-Citizen for government services by making it easier for businesses to register, digitising land records, payment of tax through electronic systems, improves ease of doing business

25%
18%
57%
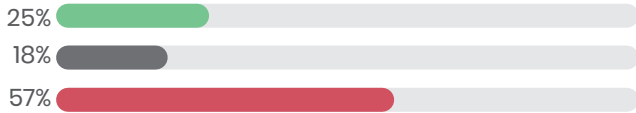
I am happy about the cost of E-commerce activities like sourcing, buying, selling, payments.

25%
18%
57%

In my view network is affordable

76%
0%
24%

Average Perception Score (APS)

52%
8%
39%
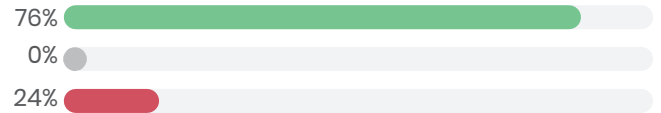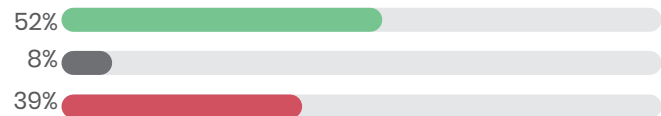
Use and **Impact** Assessment

Accessibility
43%   48%

Availability
41%   51%

Affordability
52%   39%

Impact
37%   46%

Sustainability
71%   18%

Average Perception Index (Positive)   Negative Agreement Scores

From the analysis,
it is evident...

- Heterogeneity in experience of use and impact across;-
  - Different aspects
  - Different clusters and segments
  - Different geographical locations / sites
- Ease of usage determined by level of complexity and awareness of users
- Availability does not necessarily mean usage
- Affordability determined by numerous factors
- Requires a disaggregated approach to fully analyse

DESIGN LED SYNTHESIS

User Journey Mapping

The study explored experience across different demographics

We uncovered five key pathways for design towards digital inclusion and deepening use. The findings synthesized with the user at the very centre of the process.

From awareness to advocacy:

The digital Users we encountered can be mapped on a spectrum of use based on knowledge and capacity to use digital services

Content Creation — Creates Content For sharing

Regular Use — Uses mobile internet for social & business purposes

Trial — Interacts with internet via search & uses other functions

Digital Access — Users who have access to the internet on mobile either via data plan or Wi-Fi

Understand — Understand the value of Digital Services cost/ use & trusts the services

Aware — Users who have heard of digital services (Internet) & what it does

Unaware — Users who have never heard Of digital services

Key Guiding Principles

The following five principles are grounded on the project objectives and were aimed to improve the effectiveness of our efforts.

01
Affordability

To access the digital space, institutions and individuals need access to the necessary hardware and software

02
Inclusivity

Design should focus on erasing boundaries in language, culture, mobility, literacy, and other dividers

03
Accessibility

Availability needs to arise within two segments of society: multi-user environments where communities engage and individual households

04
Knowledge & Skills

Design should ensure that all potential users have the ability and equal opportunity to engage in the digital world.

05
Relevance

Digital services should be worth the cost. It should be treated as a utility to meet daily living needs in our increasingly digital world

From user **onboarding** to **active use**

The digital use customer experience

It is important to note that, just understanding a customer's needs and wants is no longer enough. You need to know not only what they think and feel about digital interaction and digital products, but also anticipating what they are aspiring for and are motivated to do. This report developed a user digital use journey to explored key user challenges and mapping out the general findings showcasing the different levels of use and limitation to use.

"Shadows cannot see themselves in the mirror of the sun"

Evita Peron
Argentinian Statesman

User Onboarding

- Adults missing registration documents are constrained
- Physical Vendors are not readily available

Access to Gadgets

- Access to affordable gadgets in some areas is a challenge
- Accessing the right gadget (quality, durability & usability)
- Scope of the gadgets they need (specifications)
- Access to phone accessories (quality)
- Cost Issues

Purchase Airtime

- Access to Airtime/ data and/ or effective user knowledge to access in some areas is limited.
- Affordability

Data Services

- Content Delivery Channels
- Client Education Awareness on risks & Exposure
- Cyber Security & Data privacy

Voice Services

- Network Quality (voice & Data)
- Phone Network Compatibility
- Content Usability & Availability

Established Pathways for Design

The findings can generally be clustered in two of the digital divides: first, the gap between those without access to tools and gadgets (computers, smartphones, and the internet) and those with access, and second, the reality of varied accessible digital services in terms of context and comfort with, usage of, and capability to fully enjoy the benefits of digital inclusion

01

Enhance adoption and use of digital services among out of school youth in the agro-pastoral & pastoral livelihood zones

02

Structural & social challenges and their impact on enhancing the digital gender gap in mobile voice and internet use and awareness among women

03

Accessibility & inclusivity in digital service use for both PWDs and other disadvantaged groups?

04

Role and capacity of agile & tech savvy youth as agents of change in adoption and deepening use

05

Re-defining the concept of coverage – promoting interventions that enhance the experience of using digital services

06

Towards Integrated development-the need for complementary services

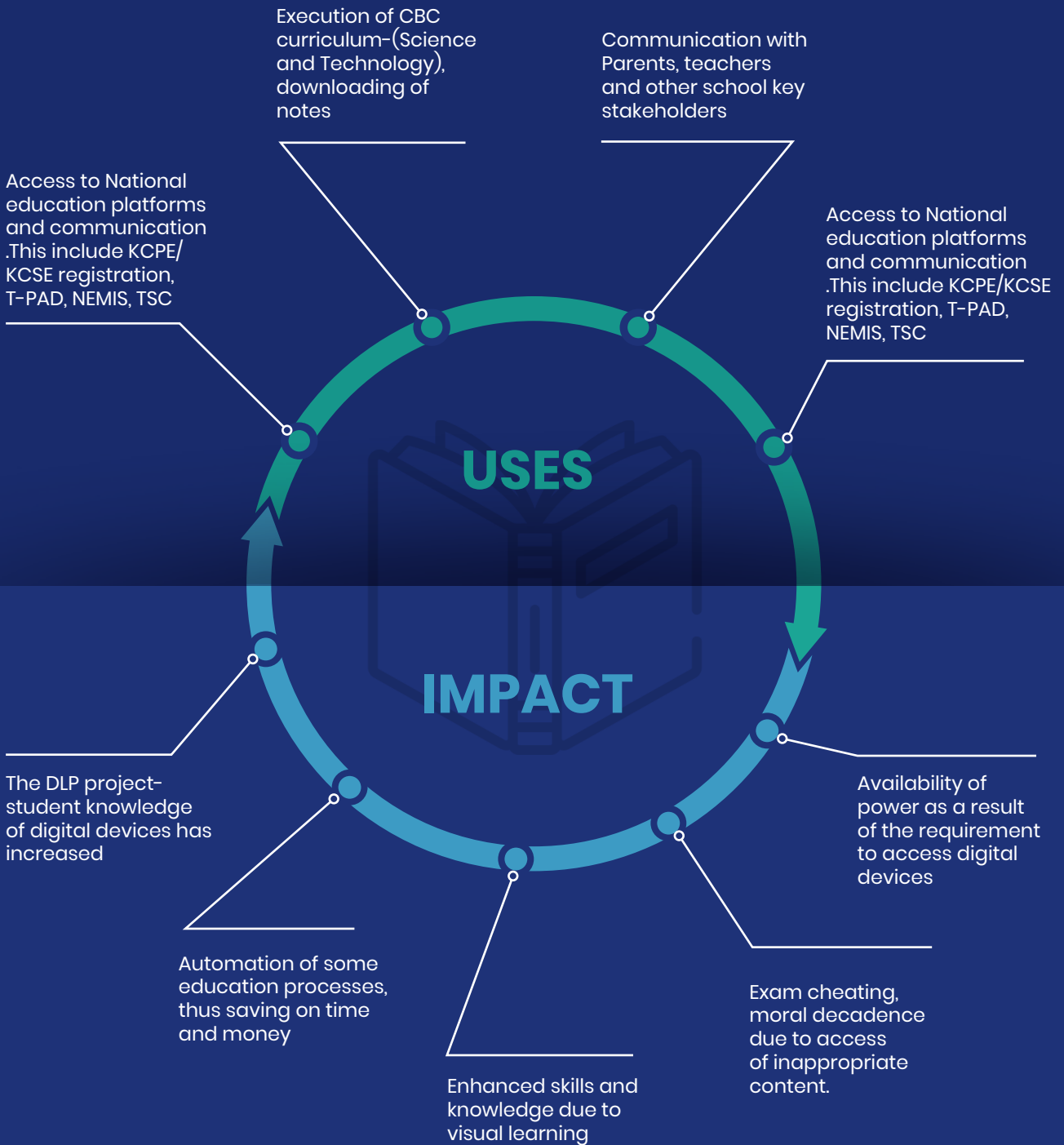# USE AND IMPACT

UNRAVELLING **THE** **INVISIBLE** FACTS

Identified categories for use & Impact

Education **01**

Health **02**

Social interaction & Public Awareness **03**

Agriculture **04**

Business **05**

06 Public Service

Education

Execution of CBC curriculum-(Science and Technology), downloading of notes

Communication with Parents, teachers and other school key stakeholders

Access to National education platforms and communication .This include KCPE/KCSE registration, T-PAD, NEMIS, TSC

Access to National education platforms and communication .This include KCPE/KCSE registration, T-PAD, NEMIS, TSC

USES

IMPACT

The DLP project-student knowledge of digital devices has increased

Availability of power as a result of the requirement to access digital devices

Automation of some education processes, thus saving on time and money

Enhanced skills and knowledge due to visual learning

Exam cheating, moral decadence due to access of inappropriate content.

Case Study

A university student in a remote area of Baringo county studying.

Peter was a third-year student at the University of Nairobi when Covid 19 struck. All educational institutions were closed for an indefinite period, and he had to go back home. His home is Lokis Sub Location in northern Baringo County. Many of the inhabitants of Lokis are pastoralists and beekeepers. Due to the uncertainty as to how long the University was going to be closed, Peter had to look for something meaningful to do. The University announced that they would commence online classes for their students. Network access was a godsend to Peter. For the past 2 years, he had been attending his classes through online platforms. During this time, Peter also realised that the local people had to travel for over 60 kilometres to process simple matters like Kenya Revenue Authority PINs. He realised that with his computer and internet access he could create a business opportunity through starting a basic cyber café! Access to digital service has enabled him to create a business opportunity that allows him to generate some basic income
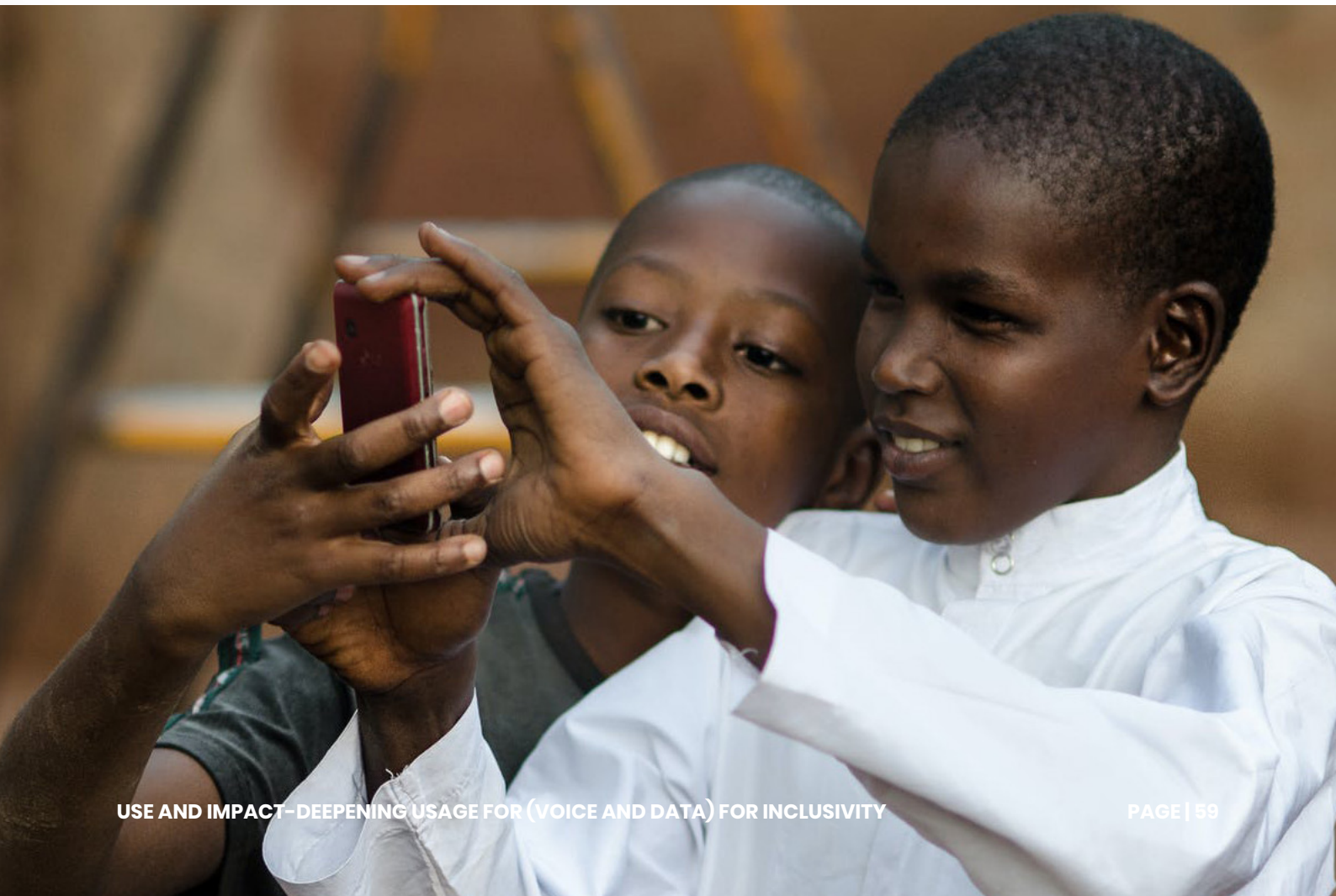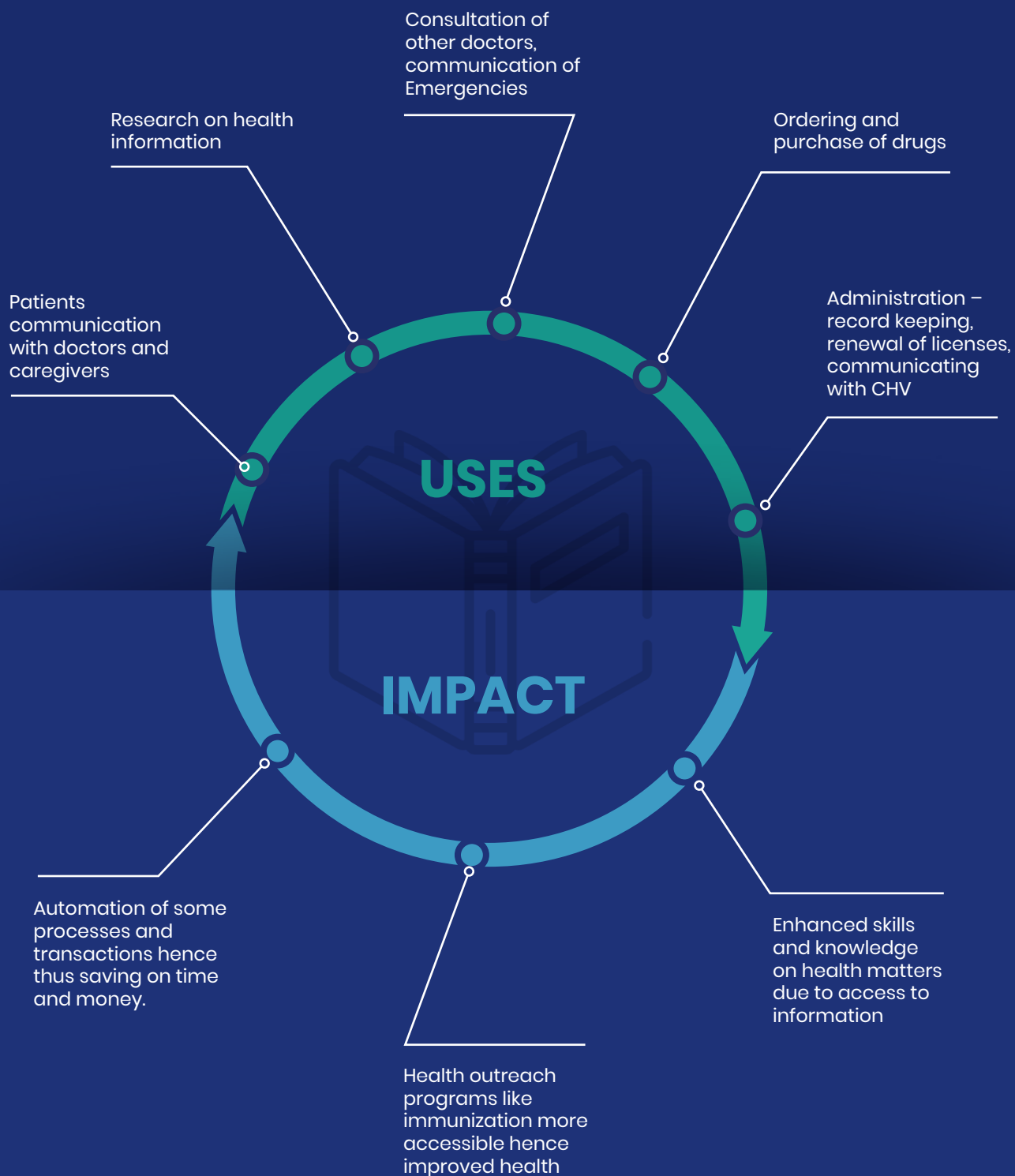
Case Study

Students in Kajiado county using YouTube to learn how to make cakes and sell.

Life among some communities can only be described as harsh. This ranges from difficult terrains, lack of rain, retrogressive culture, and lack of communication services. For a child born from such communities, education remains the only weapon to emancipate themselves. Yet attaining proper education is hampered by high poverty. To the community of Kisamis and Oloika sub location in Kajiado sub-location availability of communication services is God sent. The CBC curriculum is demanding in terms of Science and Technology. "With availability of internet, we can now comfortably demonstrate some lessons and show students what's happening in the rest of the world" asserts Mr ****** head teacher Oloika Primary school.And for the neighbouring Kisamis sub location, in Kisamis secondary school, using smart phones, students are now able to learn new skills like baking cake and chips from YouTube. In fact, they have gone to the next level of monetising their skills by even selling the cakes, says Mrs Beatrice Gitundu, principal Kisamis Secondary school.

Health

USES

IMPACT

Consultation of other doctors, communication of Emergencies

Research on health information

Ordering and purchase of drugs

Patients communication with doctors and caregivers

Administration – record keeping, renewal of licenses, communicating with CHV

Automation of some processes and transactions hence thus saving on time and money.

Enhanced skills and knowledge on health matters due to access to information

Health outreach programs like immunization more accessible hence improved health
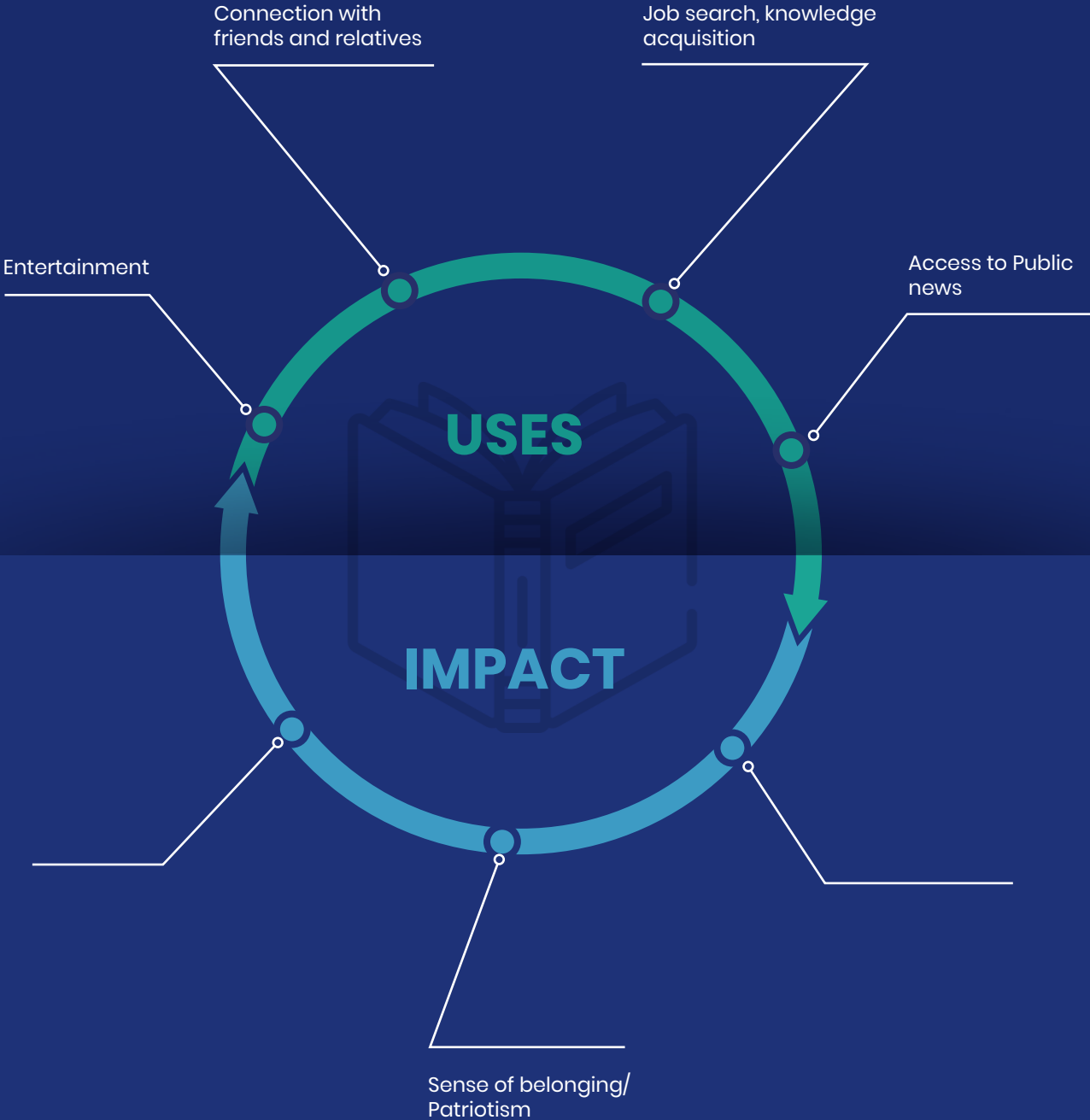
Case Study

Defaulter tracing in Bosa sub-location-Gozani Health Centre Kinango Sub-county, Kilifi county.
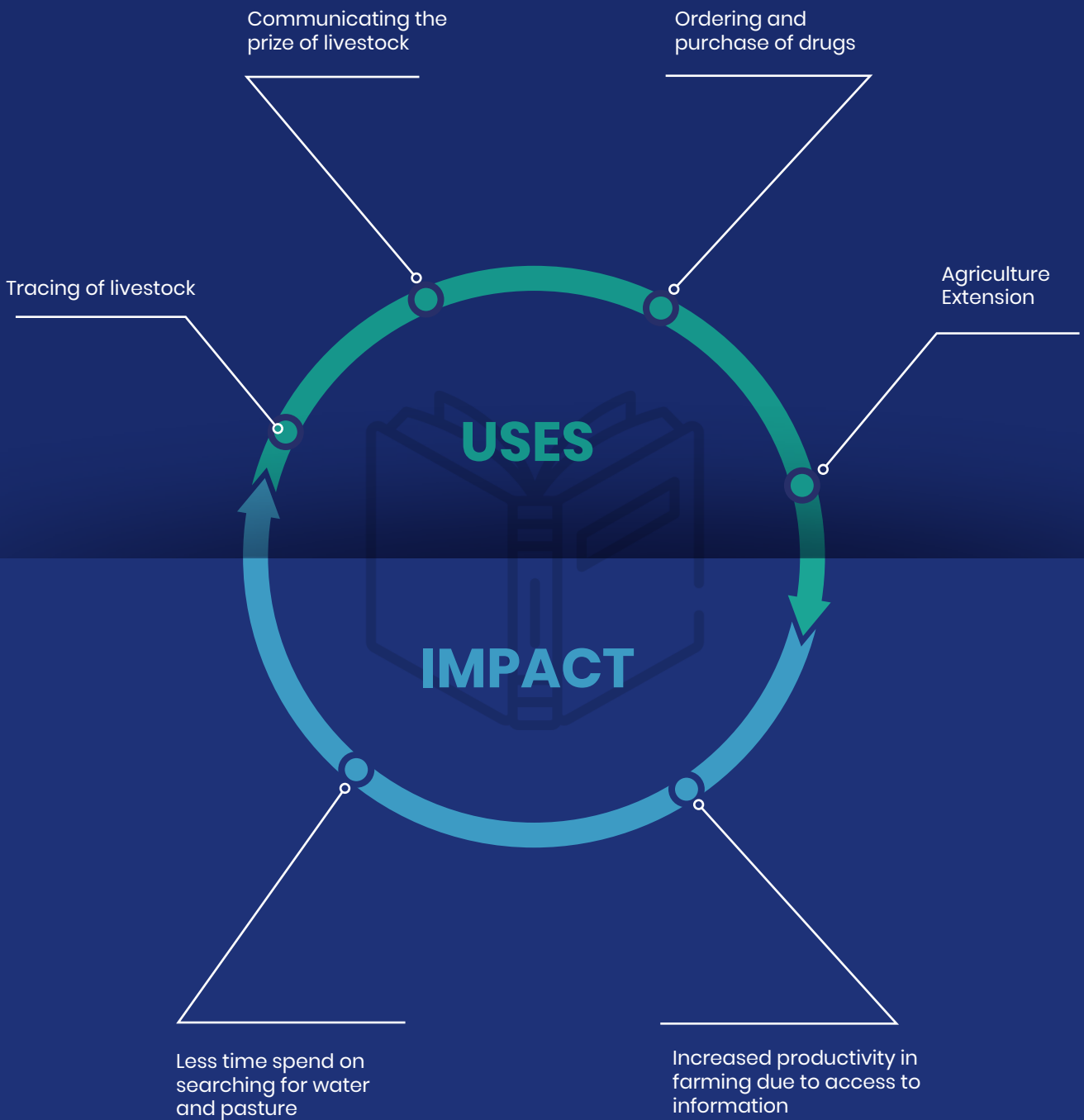

Health remains one of the key services the government has to offer its citizens. Among the health services that are widely offered by the government include immunization, vaccination, and information dissemination. Some communicable diseases like Polio, Tuberculosis, Measles demand very strict adherence to the prescribed doses. However due to some communities' lifestyle, some people give priority to other needs like survival of their livestock as opposed to the well-being of children and even their own health. As a result, they don't give priority to medical regimes as prescribed by doctors. However, availability of communication services has come in handy to help alleviate this problem, thus improve the livelihood in these communities. According to Nurse-in charge of Gozani Health Centre in Kinango Sub-location, one of the biggest benefits they have derived from availability of communication services is defaulter tracing. "We keep records of all patients, their location, and their local administration officers. Later we use this information to follow-up in case they default in adhering to prescribe regimes for some medication." As a result, this enables us to improve the health of both the children and adults. This is a classic case of how availability of communication services results in a healthier and well-informed society, and especially among the under-privileged.

Social interaction
& Public Awareness

Connection with
friends and relatives

Job search, knowledge
acquisition

Entertainment

Access to Public
news

USES

IMPACT

Sense of belonging/
Patriotism

Agriculture

Communicating the prize of livestock

Ordering and purchase of drugs

Tracing of livestock

Agriculture Extension

USES

IMPACT

Less time spend on searching for water and pasture

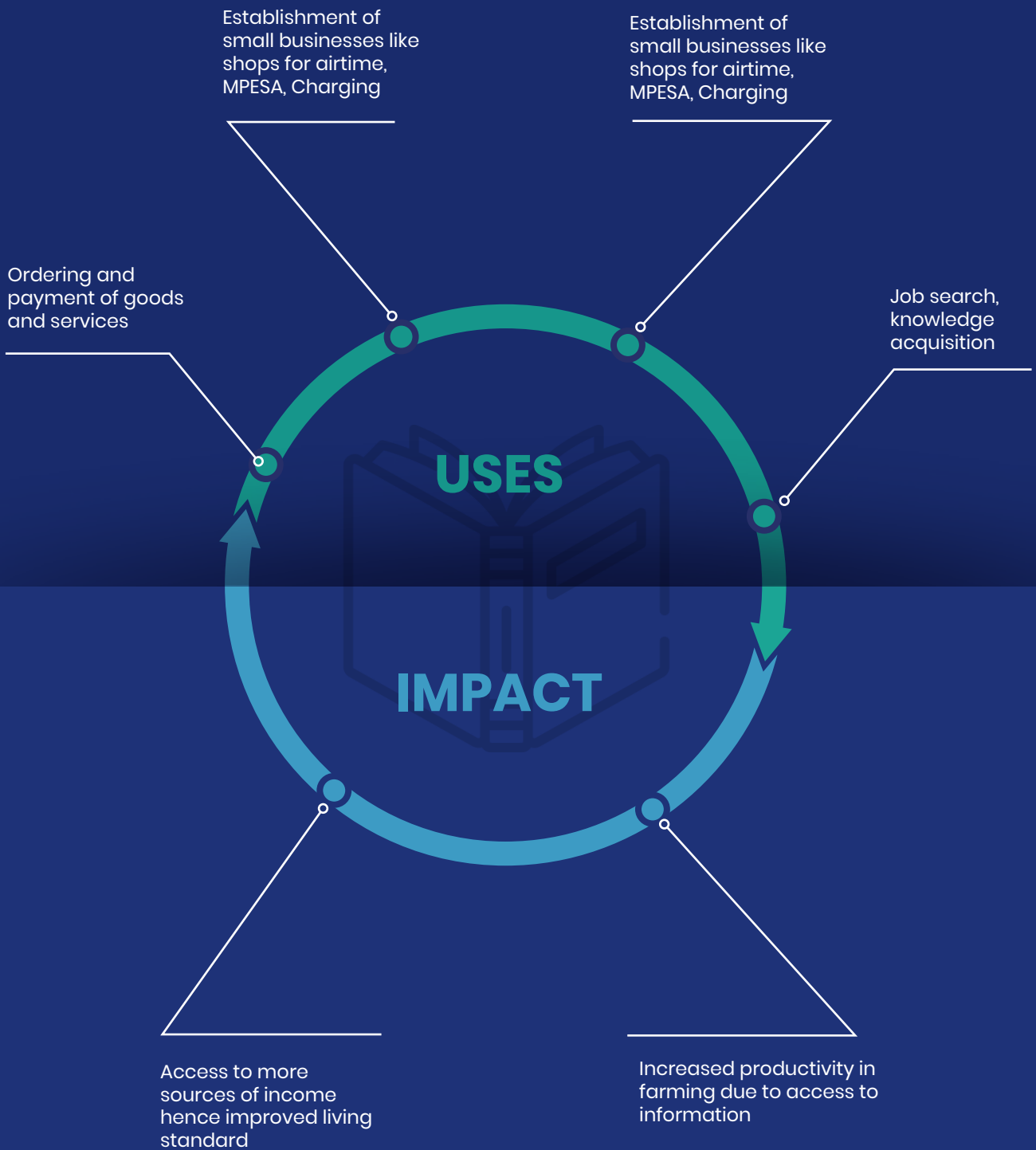Increased productivity in farming due to access to information

Case Study

Livestock tracking and identification of water points among the Somali community in Goriale sub-location Garissa county.

To the nomadic community of Somali's in the north eastern region of Kenya, livestock is everything. From livestock comes their food, wealth, dowry and general livelihood. This livestock includes cattle, goats, camels, and horses. However, nature has not favoured them in terms of the weather. Sometimes it gets so dry their livestock suffers from lack of water and food. With nothing else other than livestock, these communities have to trek hundreds of kilometres in search of water and food. Before the advent of mobile communication, it would take days or even months in search of pasture and water. This search was also risky a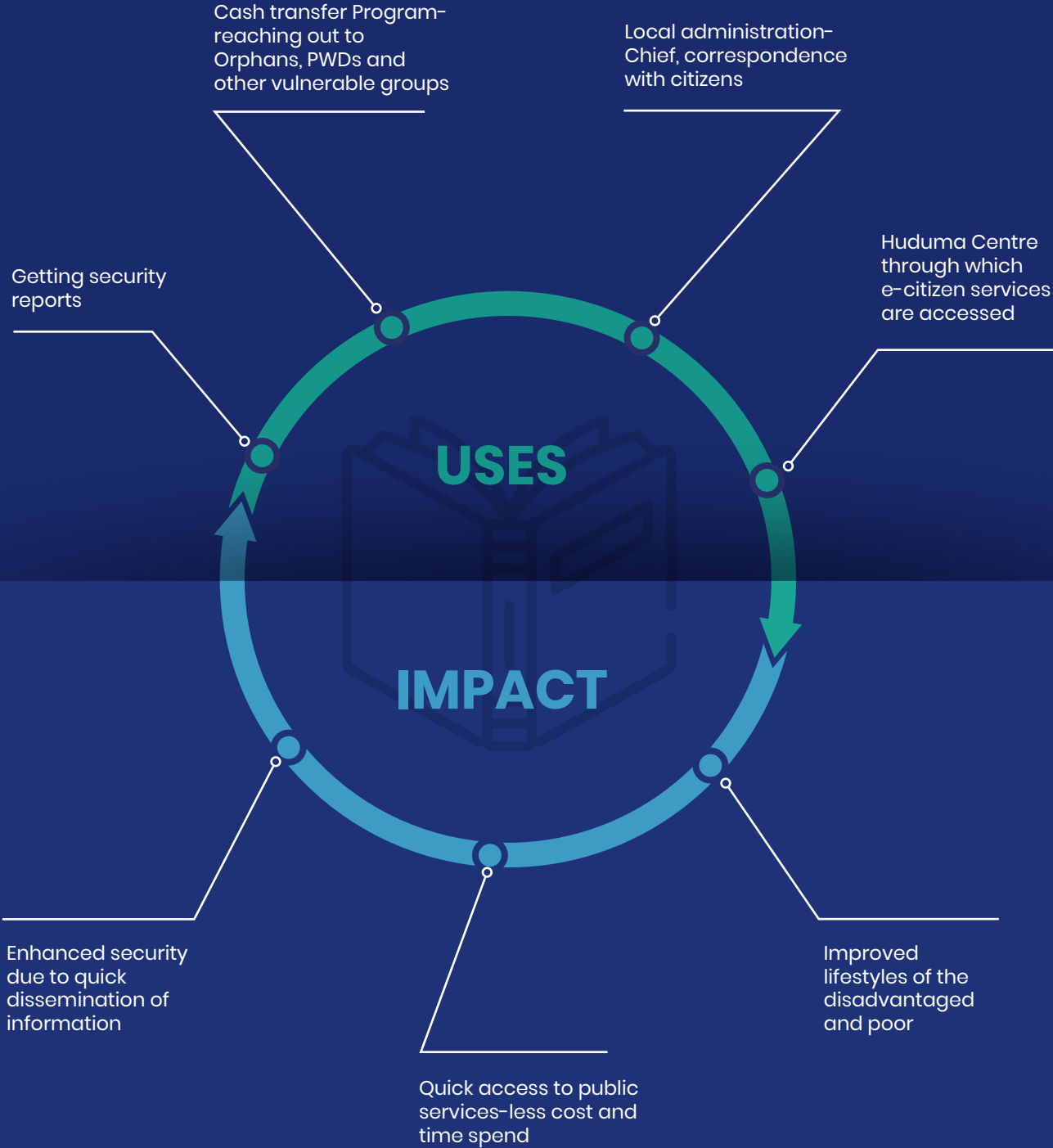nd insecure due to harsh terrain and adversaries along the away. "With phones and availability of network, we now just need to send a few people on an expedition to search for water and pasture, call back to report on the location, before we move all our livestock. This has shortened time to locate places with water and pasture and move our livestock, and increased the security of our livestock", asserts Abdi, assistant chief Gorialle sub location, Garissa county. Besides, our livestock now remains healthy for longer periods than before and thus able to fetch better prizes. Availability of mobile phones also help us to keep in touch with herds boys in the field and for men to keep in touch with their families while out in the fields

Business

Establishment of small businesses like shops for airtime, MPESA, Charging

Establishment of small businesses like shops for airtime, MPESA, Charging

Ordering and payment of goods and services

Job search, knowledge acquisition

USES

IMPACT

Access to more sources of income hence improved living standard

Increased productivity in farming due to access to information

Public
Administration

Cash transfer Program-
reaching out to
Orphans, PWDs and
other vulnerable groups

Local administration-
Chief, correspondence
with citizens

Getting security
reports

Huduma Centre
through which
e-citizen services
are accessed

USES

IMPACT

Enhanced security
due to quick
dissemination of
information

Quick access to public
services-less cost and
time spend

Improved
lifestyles of the
disadvantaged
and poor

RECOMMENDATIONS & STRATEGIES FOR DEEPENING USE.

01

Enhanced adoption and use of digital services among out of school youth in the agro-pastoral & pastoral livelihood zones

Despite men having more access to cell phones as opposed to women, and with such a greater influence on community and family functions, having decision making autonomy in most marginalized communities and spending most of their time taking care of animals in the case of pastoral communities, their limitations in skills, motivation and the confidence to use digital services is a major barrier to advancing use.

01 How Might We.

… design interventions to address structural and social issues to reduce the gender gap in digital service use and awareness among women?

Strategy & Recommendations for deepening

It is evident that the move to make digital services and content available does not translate to use and engagement. These report recommends three key strategies that will play a role in advancing use among these user men and out of school youth.

Lifelong learning

There is need to design interventions to promote access to and use of lifelong learning digital content, adoption of accessible channels and content that is contextualized for different livelihood zones and social contexts.

Digitizing government service

This report recommends the development and promotion of local contextualized innovative administrative engagement processes that are digitally enabled.

Digital Business Enablement

A multi sectoral approach should be adopted in promotion of digital innovation for business in marginalized areas. These platforms can be text and WhatsApp enabled to ensure convenience and usability.

02

Structural & social challenges and their impact on enhancing the digital gender gap in mobile voice and internet use and awareness among women

Women are seen to embrace tech faster than men in most areas. However, there are structural and social issues that limit them from accessing and using digital services.

"She should not own a phone and if she owns one it should contain only my number"

– Husband, Kitui

02 How Might We.

... design interventions to address structural and social issues to reduce the gender gap in digital service use and awareness among women?

Strategy & Recommendations for deepening

The findings of these research and a review of different materials (ref here) suggest that women are more likely to use and access the internet and use social networking websites more than men.
Overlapping disadvantages have exacerbated the existing gender divide in digital service access and use especially in marginalized and deeply cultured areas.

Experience Design & Enhanced Usability

Relevant stakeholders should aim at standardizing and simplifying the complexity of use to ensure that women are able to and encouraged to , try out (where trust is a challenge i.e., for digital financial services), learn and use digital services

Adoption of Co-Design Approaches in Deepening Use

This report recommends the design of programs to eliminate misperceptions & re- align social norms that limit women from accessing and using digital services. Stakeholders need to intentionally drive campaigns aimed at incentivizing conversation on the benefits of digital services and promoting women targeted digital initiatives.

Design Interventions

Co-Creation & Co-Design

Reducing the Gender Gap
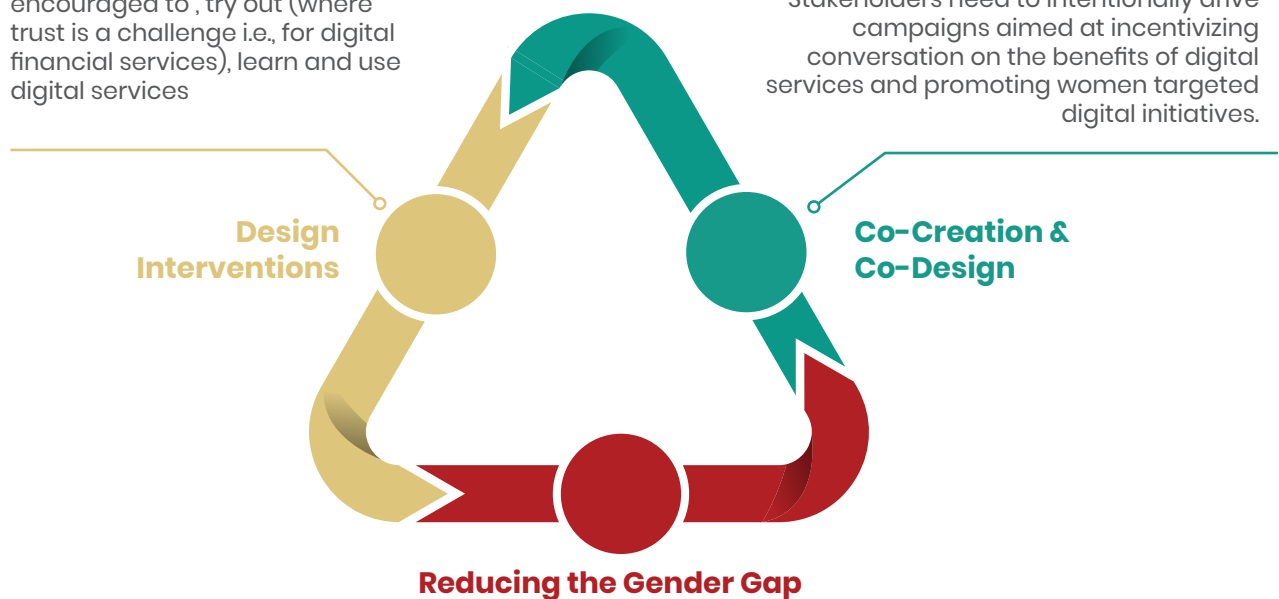
Action towards reducing the gender gap in Digital Inclusion

This report proposes the adoption of a living labs model of engagement , pegged on existing women social interaction platforms such as, table banking groups and women groups, to facilitate problem and needs identification and co-creation processes.

03

Accessibility & inclusivity in digital service use for both PWDs and other disadvantaged groups?

Accessibility & Inclusivity for Persons with Disability and other Vulnerable groups has been neglected for economic and design reasons.

"PWDs should be put in groups and have a leader to advocate for their needs"

– FGD in Kitui

03 How Might We.

design promote accessibility & inclusivity in digital service use

Strategy & Recommendations for deepening

The digital divide is viewed as a continuum of access, in which factors such as skills, access, support and attitudes can explain how people utilize technologies.

Unique factors such as disability and literacy disadvantages present a challenging task in addressing these needs. The following key strategies need to be considered in enhancing and deepening use among these special groups.

01 Inclusive Service & Product Design

These proposal recommends facilitation of interventions targeted towards enhanced innovation in the design of both digital gadgets and content and content delivery mechanisms that consider PWD needs and their context.

02 Adoption of Co-Design Approaches in Deepening Use

These report recommends further investigation to generate evidence for statistics and insights in digital disability gaps and contextual needs to drive user experience for PWDs and disadvantaged persons.

04

Role and capacity of agile & tech savvy youth as agents of change in adoption and deepening use

Tech savvy and educated youth in this regions play a major role in supporting adoption and use of digital services, leveraging on this can yield high impact. We identified this group as digital outliers considering the rate of use of digital services in their areas. Most of them are based in urban areas and sometimes carry out outreach activities in rural locations

"**young people need to be educated and informed about how to stay safe online, and about how to respond to experiences of cyber-bullying and seek appropriate support**"

04 How Might We.

build the capacity of agile & tech savvy youth as agents of change

Strategy & Recommendations for deepening

The role of existing outliers and early adopters to influence and enhance adoption and use of digital services is essential. Design focused on use of existing structures has a better chance to create feasible, viable and impactful interventions considering they are market driven.

This report recommends three key elements in using early adopters as agents of change.

01
Skills for the Digital Transformation using ICT Champions-CNOs

Drive and expand learning opportunities through young people as "Community Digital Champions" . These champions can be used to promote digital use incentives and strategies while driving on the already proposed community networks, the champions can be enabled to partner CNOs from the last mile usage.

02
Promotion of a new-age Innovation Hubs

Leveraging existing local investment in digital infrastructure to support both learning and access to digital services. Stakeholders should engage in supporting, equipping and promotion of local ICT infrastructure investment through both business financing channels and support to enable and provide essential digital services.

03
Adoption of Lean Research & Big Data

Adoption of lean research methodologies in ensuring a constant stream of insights by developing a platform of digital ambassadors and digital channels to facilitate constant information flow, support research for digital services use and experience and provide support to other stakeholders to enhance user experience through identification of market driven insights.

05

Re-defining the concept of coverage – promoting interventions that enhance the experience of using digital services

The proposed USF MEL framework should ensure its covers indicators beyond infrastructure coverage. Its envisaged based on the recommendations from ICT sector/industry documents and field findings, the framework monitors the fund's performance on a) infrastructure and services being offered in terms of coverage and quality of services; b) social-economic benefits accrued from the services and their social impact indicators; and c) financial and return on investment to the fund, thematic areas being offered as both direct and complimentary services.

05 **How Might We.**

...design interventions to promote use-over-coverage

"**All components of projects initiation, implementation and lessons leant to be part of MEL framework**

Strategy & Recommendations for deepening

Intentional design in contextualized policy and infrastructure in enhancing use and access of digital services is a key contributor to the success of the USF objective. Key stakeholders play different roles in facilitating digital access, however, there is a clear need to ensure co-creation and co-design of the different approaches to ensure the attainment of the common goal. This report identifies 4 key strategies to facilitate a multi-stakeholder approach in enhancing service delivery and thus deepening use of digital services.

Triple Helix Stakeholder Collaboration

This report recommends an intentional process of creating an environment to facilitate triple helix (Public, Private sector and Communities) stakeholder collaboration, on key policies and interventions to facilitate and incentivize innovation in digital inclusion initiatives. Stakeholders should also facilitate the development of contextualized policy directed towards the needs and context of specific digitally excluded communities

CA/ USF Department Institutional Strengthening and Capacity Building

The use and impact plus deepening strategies call for CA to build USF department capacity at technical, quality of service monitoring, funds resourcing and disbursement, and monitoring of the different projects envisaged from the proposed solutions with a keen focus on adoption and use of emerging technologies through both business financing channels and support to enable and provide essential digital services.

Enhanced Digital Resilience for novice users

These report recommends the development and coordination of a digital resilience strategy aimed at enabling the development of digital skills, emotional understanding, and effective response to online risks.

Re-Designing MEL Metrics

Re-defining the design, procurement, monitoring and evaluation criteria to align performance to USF Objectives. Despite recording coverage as a key matrix of USF success, poor quality remains a stumbling block in usage. The proposed USF MEL framework should ensure it covers indicators beyond infrastructure coverage

# 06 Towards Integrated development-the need for complementary services

Most of the areas where USF services have been provided lack basic facilities such as power, reliable water, well-maintained roads. Hence the access and use of ICT services whereas useful may appear as a luxury. Other social amenities like health facilities, schools and entertainment are either lacking or insufficiently equipped to serve the communities. Deliberate efforts must be initiated to provide an enabling environment to enable these communities to live decent lives

04 How Might We.

design interventions to provide basic complementary services to deepen use in marginalized areas

"All components of projects initiation, implementation and lessons leant to be part of MEL framework
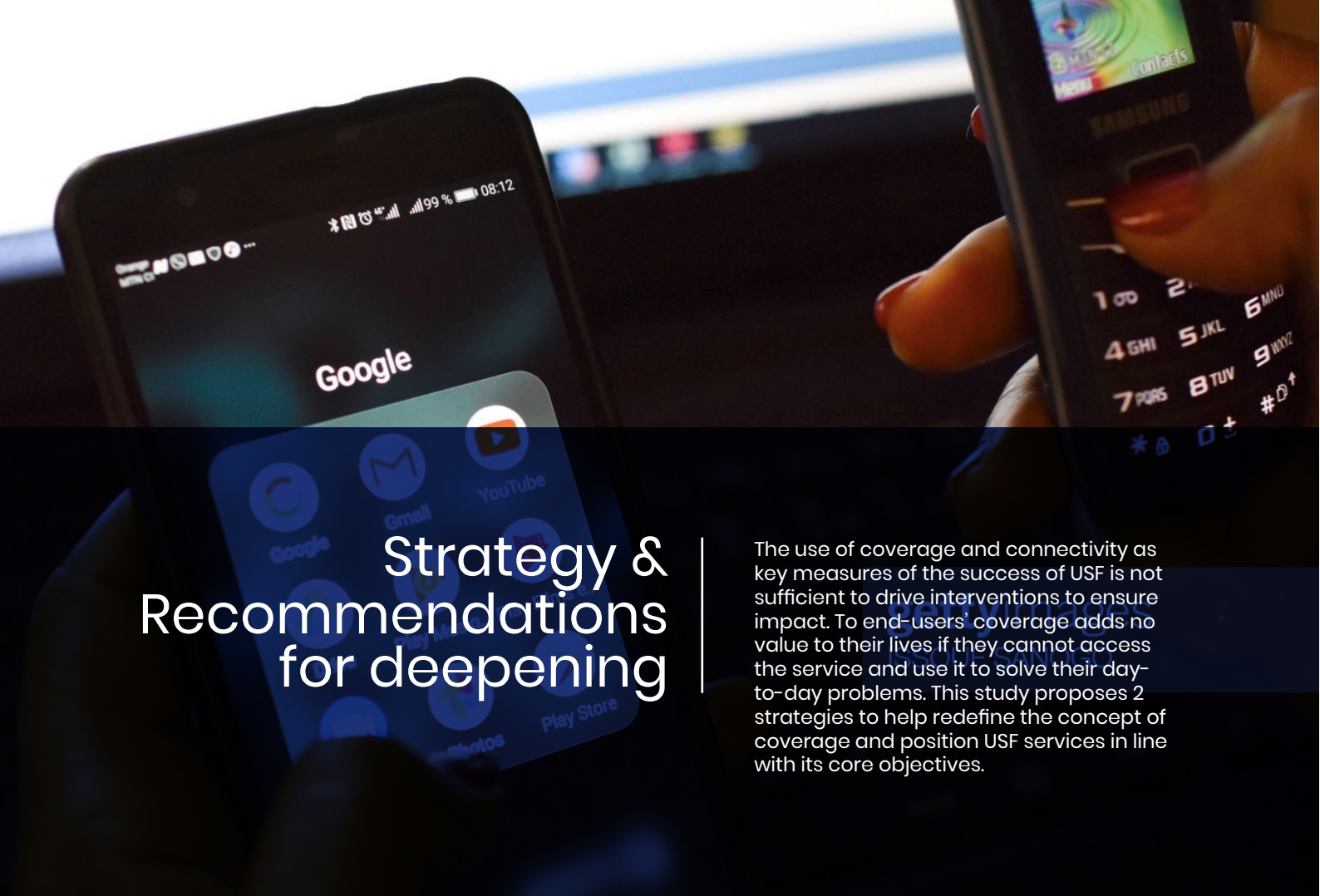
Strategy & Recommendations for deepening

The use of coverage and connectivity as key measures of the success of USF is not sufficient to drive interventions to ensure impact. To end-users' coverage adds no value to their lives if they cannot access the service and use it to solve their day-to-day problems. This study proposes 2 strategies to help redefine the concept of coverage and position USF services in line with its core objectives.

Multi-Sectoral Engagement

There is a need for a structured engagement approach for multi-agency/sectoral partnership to accelerate development projects. Other infrastructure services such as power, water, roads and security which are outside USFs mandate are best provided through partnerships and collaboration with relevant government agencies.

The collaboration must however be deliberate and structured by the establishment of agreements following stakeholder engagement. USF should therefore initiate discussions with organizations like Kenya Power, Rural Electrification and Renewable Energy (REREC), Kenya Rural Roads Authority(KERRA), Kenya Transmission Company (KETRACO) to exploit ways of collaboration that will enhance the impact of USF services. The same should be initiated with relevant government ministries.

Decentralization of e-government services

The government needs to deliberately plan to decentralize e-government services like the popular Huduma centers close to these communities. Whereas most Huduma centers are located at County headquarters, taking them closer at the Sub-county level will not only provide the much-needed pull effect for other complementary services but also help create awareness and environment for faster diffusion of digital services awareness and skills. To supplement this initiative, USF should provide connectivity to all public institutions like health centers, schools, and police stations located among beneficiary communities.

Sustainability

Sustainability of USF projects was a key concern raised by Key stakeholders during the study. Indeed, its one principle that guides a successful USF project as guided by ITU. With sustainability having no universally agreed definition, we anchor our proposal in this study on the meaning congruent to USF projects. We look at sustainability as the ability to uphold provision, usage and, affordability without relying on external support

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Road to **sustainability**

Insights gathered from this study reveal that for USF projects to be sustainable, sustainability should be looked at from a multidimensional perspective. The study posits that there are four main elements that interact continuously and affect sustainability of USF type of project. The four elements constitute the "sustainability wheel

Macro-environment

The ability of the government to provide complementary services such as power, roads, and security in the gap areas affects both the consumption ability and deployment, thereby affecting sustainabilitcostsy. Stakeholders in the macro-environment should be incorporated in the end-to-end project design so as to increase the chances of sustainability.
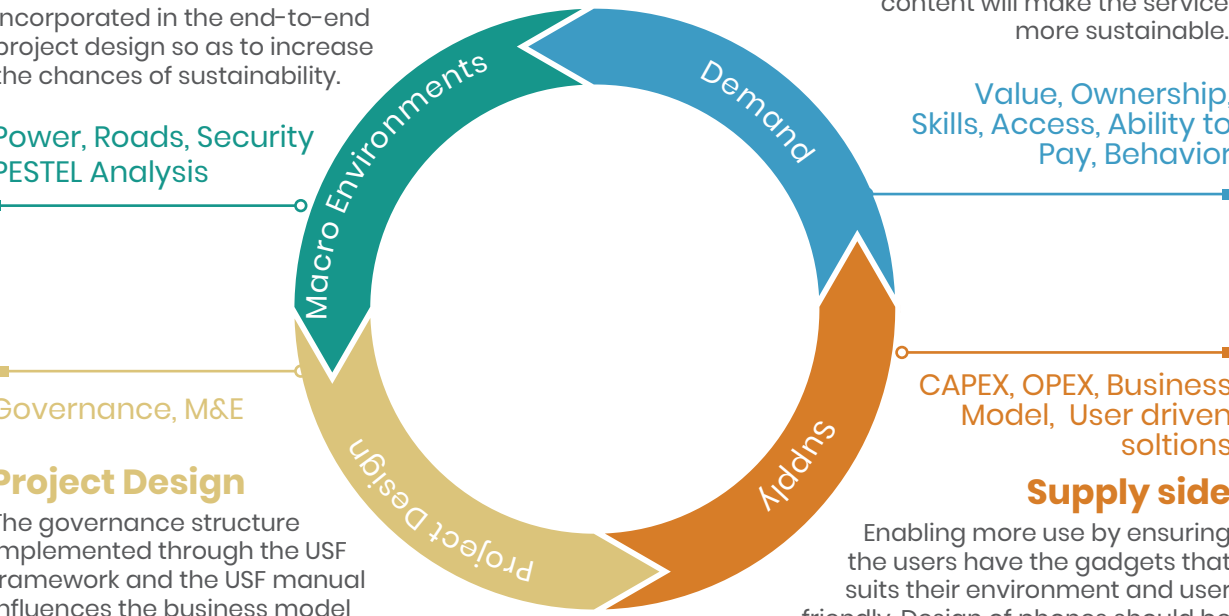
Power, Roads, Security
PESTEL Analysis

Demand Side

It is imperative that the end-users are empowered to consume USF services without external support. Initiatives that increase the value of services such as capacity building, local content will make the service more sustainable.

Value, Ownership, Skills, Access, Ability to Pay, Behavior

CAPEX, OPEX, Business Model, User driven soltions

Supply side

Enabling more use by ensuring the users have the gadgets that suits their environment and user friendly. Design of phones should be driven by such innovation methods of HCD and ensuring designs are user driven. Pursuing holistic approach to solutions provision builds a more dependable solution other than relying on ICT as an all fix solutions

Governance, M&E

Project Design

The governance structure implemented through the USF framework and the USF manual influences the business model adopted by service providers eventually affecting its sustainability. In addition, identification of USF projects should be subjected to reliable tools such as the impeding ITU Universal Service Efficiency Financing Toolkit.

Macro Environments · Demand · Supply · Project Design

Part III: Monitoring Learning and Evaluation Framework

1. MEL framework (Based on the findings from (FGD, KII, SAQ)

Introduction

Following the findings from the field (both qualitative and quantitative data), the HCD approach was applied to cluster key challenges and provide a design pathway for strategies. The proposed MEL framework has considered the solutions developed from the HCD. The solutions targeted deepening usage, quality of service and coverage with further consideration for complementary services which are crucial in the USF related areas. The six solutions have been crafted to extract themes and followed by desired interventions and parameters to be monitored. The framework has addressed CA/USF department institutional strengthening and management by including components of funds resourcing, disbursing, governance and return on investment to the shareholders. The thematic framework has been further developed to include: a) Thematic based Matric and b) Indicators Matrix

Proposed MEL Thematic Framework

KEY CHALLENGES AND DESIGN PATHWAY FOR STRATEGIES	THEMES/SECTOR	NEEDS	INTERVENTIONS	HOW TO MONITOR/ PARAMETER
1. Enhance adoption and use of digital services among out of school youth in the agro-pastoral & pastoral livelihood zones	Providing Digital Services for the School Youth (Morans)	a) Need to engage the energetic youth with ICT life skills training to come up with local social-economic solutions b) Need to have the youth work on digital programs that have local context friendly c) Provide ICT content and application support for them to exploit their talents and skills e.g. YouTube platform, Music Studios etc.	a) Having training hubs or centres where they can meet for learning b) Competent based learning programmes to address their local needs and life skills.	• Number of Hubs/Centres • Number of training programs • Number of Competent Based training centres • Number of Competent Based training/Lifeskills programs • Number of champions (Morans)

KEY CHALLENGES AND DESIGN PATHWAY FOR STRATEGIES	THEMES/SECTOR	NEEDS	INTERVENTIONS	HOW TO MONITOR/ PARAMETER
2. Structural & social challenges and their impact on enhancing the digital gender gap in mobile voice and internet use and awareness among women	Enhancing digital Gender Gap among women	a) The digital gender gap has been widened by the women's lifestyle and position in the family b) Their level of literary c) Affordable gadgets that fit their environment and pattern of life.	a) Establish living labs approach to spur innovation among women b) Promoting entrepreneurial activities i.e. Poverty graduation. c) Designing programmes around the lifestyle of the women e.g. ICT support for Chamas, table banking and merry go round. d) Designing context friendly gadgets. gadgets for women. (Accommodating the lifestyle of the woman. Heavy-duty durable phone. Solar-powered) e) contextualizing digital content/service (language, culture, women's issues, religion etc.) f) Broadcasting. Access to content on radio	• Number of Competent Based Training Centres/hub • • Number of entrepreneurship programs for women • • Number of women poverty graduation program • Number of Women in the program • Number of women-friendly gadgets • Number of digital and broadcasting content developed targeting women • Number of broadcasting stations
3. Accessibility & inclusivity in digital service use for both PWDs and other disadvantaged groups?	Accessibility & inclusivity in digital services for PWDs	a) The is a great need to develop gadgets that allow PWDs to be included in the digital services b) Address the literacy gap due to the applications not accommodative of PWDs c) Few or no ICT support facilities/ e-government in the regions for PWDs	a) Special devices that address the uniqueness of PWDs include elements such as privacy features, voice-enabled services, applications that consider persons living with disability etc.) b) Special needs centres where e-government services are offered c) ICT Training centres offer skills for supporting livelihood and accessibility for PWDs d) Research on PWDs to develop metrics to advise service delivery e) Offer subsidized costs on gadgets and services (Leveraging on disability certification)	• Number of special devices targeting the PWDs • • Number special centres offering e-government services and web-based solutions targeting PWDs • Number of ICT centres offering PWDs related solutions • Developed Metrics for PWDs • Established and administered subsidize for PWDs on gadgets and services

KEY CHALLENGES AND DESIGN PATHWAY FOR STRATEGIES	THEMES/SECTOR	NEEDS	INTERVENTIONS	HOW TO MONITOR/ PARAMETER
4. Role and capacity of agile & tech-savvy youth as agents of change in adoption and deepening use	Capacity build tech-savvy youth as agents of change	a) Need to engage the energetic youth with ICT life skills training to come up with local social-economic solutions b) Need to have the youth work on digital programs that have local context friendly c) Provide ICT content and application support for them to exploit their talents and skills e.g. YouTube platform, Music Studios etc.	a) Develop ICT champions (they should be the influencers and ambassadors for ICT products and services); used as a data collector for social-economic related information b) Driving Community Networks (Partner national CNOs from the last mile usage) c) Leveraging on youth lifestyle to deepen usage. (Gamification and online trading. Digital entrepreneurship (web 3.0) d) Empowering young people to create digital content. e) Provide public WIFI. f) Creation of an Innovation hub run by an ICT champion who supports communities and reports issues/challenges g) Utilising the created youth champions to be part of the M&E data entry (assist to obtain Information on socioeconomic, infrastructure etc) - research assistants-e.g. global network for youth)	• Number of youth as champions and influenced • Number of youth and community networks • Number of digital content developed • Number of Public WIFI established • Number of innovation Hubs • Number of youth recruited as local representation for data collection exercises

KEY CHALLENGES AND DESIGN PATHWAY FOR STRATEGIES	THEMES/SECTOR	NEEDS	INTERVENTIONS	HOW TO MONITOR/ PARAMETER
5. Re-defining the concept of coverage – promoting interventions that enhance the experience of using digital services	Enhance the experience of using digital services	a) Availability of signals is defined as the first level of access b) Quality of services should be added to the access of the signal c) Gadgets and complimentary services to support use (Airtime, data, etc) d) Regular Access Gap analysis to ensure coverage is addressed on a more regular basis	a) Secure technology to address the issue of monitoring signals and QoS b) Seek alternatives and strategies to address issues of complementary services for the users c) Use technologies to conduct Access Gap assessment regularly	• % of QoS • Number of MOUs with complimentary service providers • Number of Technologies used on Access Gap Assessments and solutions
6. Enhancing & deepening use through ensuring availability & accessibility of basic complementary services	Ensuring availability & accessibility of basic complementary services	a) A holistic approach in enabling digital inclusion and deepening the use of digital services. b) This report recommends an intentional process of creating an environment to facilitate triple helix (public, private sector and communities) stakeholder collaboration,	a) Pre-assessment of each project to determine the complementary services b) develop and engage the implementing partners to determine the level and framework of engagement	• Number of complementary services • Number of MOUs and framework for engagement

KEY CHALLENGES AND DESIGN PATHWAY FOR STRATEGIES	THEMES/SECTOR	NEEDS	INTERVENTIONS	HOW TO MONITOR/ PARAMETER
7. Institutional Strengthening	Enhance the funds management, resourcing and disbursement	a) USF need to expand the sources of contributors to the fund beyond the usual licensees b) ensure the contributed funds have been utilised within the stipulated period on the budgeted projects	a) Developed Resource mobilisation plan b) Disbursement framework and plan developed	• Resource mobilisation plan • Funds management plan
	Enhance and build capacity to handle the MEL	a) The components to be monitored are beyond the mandate of CA. There is a need to build a MEL framework at the inception of the projects to encompass all components that need monitoring and by who. b) the CA to strategies to use other institutions and organisations or even local resources to assist in data capturing and monitoring of indicators	a) Establish standard MEL components CA can handle internally and those to seek external assistance b) Establish a framework of external assistance to be used	• MEL working framework with both internal and external components defined

KEY CHALLENGES AND DESIGN PATHWAY FOR STRATEGIES	THEMES/SECTOR	NEEDS	INTERVENTIONS	HOW TO MONITOR/ PARAMETER
	Capacity Build USF Department with relevant equipment and technologies to enhance the quality of service monitoring	a) The QoS monitoring should remain a key deliverable on the CA side. The department needs to have both equipment and technologies to drive this component with ease other than either replying on the MNOs or through access gap studies	a) Acquire relevant technologies or equipment to monitor QoS at the USF related areas	• % of QoS
	Enhance by use of technology to conduct access gap studies	a) Access gap studies need to be more regular and less costly. This one study that technology can assist USF to have it done with little visits to the USF areas a) The use of GIS and other supportive technologies should lighten the frequent sites visits to establish gap areas	a) Embrace emerging technologies for conducting access gap studies, identify gap areas and enhancing Monitoring and Evaluation	• Number of New approaches adopted in conducting gap studies and monitoring and evaluation • Number of access gap identified within 5 years

1.1. Thematic Priority Outcome Matrix

THEMATIC PRIORITY	THEMATIC OUTCOME	INTERVENTIONS	LEAD SECTOR/ INSTITUTION
1. Enhance adoption and use of digital services among out of school youth in the agro-pastoral & pastoral livelihood zones	a) School Youth are familiar, have skills and confidence with digital services. b) they can utilise their skills for livelihood	a) Conduct a detailed training needs assessment b) Establish training hubs or centres c) Competent based learning programmes to address their local needs and life skills.	CA, ICT Education training centres
2. Structural & social challenges and their impact on enhancing the digital gender gap in mobile voice and internet use and awareness among women	a) A women population that use digital services and gadgets that fits their design and usability b) Established ICT centres that increase usage and enhances co-designs for women contents	a) Conduct a detailed woman needs assessment b) Establish ICT centres that increases usage and enhances co-designs for women contents c) Competent based learning programmes to address their local needs and life skills	CA, ICT Women biased training centre CA, Gadget Manufacturer
3. Accessibility & inclusivity in digital service use for both PWDs and other disadvantaged groups?	a) A better understanding of the needs, motivations and barriers of PWDs to devise better ways to serve them b) A disability inclusion environment with eliminated discrimination	a) Research on PWDs and develop metrics to advise service delivery b) Offer subsidized costs on gadgets and services (Leveraging on disability certificate)	CA, NCPD, Gadget Manufacturer
4. Role and capacity of agile & tech-savvy youth as agents of change in adoption and deepening use	a) A tech-savvy youth that utilizes its skills in providing local social-economic solutions b) A youth that works on digital programs that have local context friendly	a) Develop ICT champions (they should be the influencers and ambassadors for ICT products and services); used as a data collector for social-economic related information b) Establish ICT Hubs and Community Networks to support local applications and content	CA, Youth Based Tech Hub Institution

THEMATIC PRIORITY	THEMATIC OUTCOME	INTERVENTIONS	LEAD SECTOR/ INSTITUTION
5. Re-defining the concept of coverage – promoting interventions that enhance the experience of using digital services	a) USF related areas where Quality of services is used as a basis of defining availability and support access to gadgets and complementary services (Airtime, data, etc) b) Regular Access Gap analysis to ensure coverage is addressed on a more regular basis	a) Enhance by use of technology to address QoS b) Availability of gadgets and complementary services to increase the use c) Enhance access gap analysis by utilising technology	CA/Vendor (QoS, Gadgets) CA/Vendors (Access Gap Analysis)
6. Enhancing & deepening use through ensuring availability & accessibility of basic complementary services	a) A holistic approach when dealing with USF solutions b) An environment at has utilised ICT as an enabler to the public, private sector and communities) service provision	a) Pre-assessment of each project to determine the complementary services b) Develop and engage the implementing partners to determine the level and framework of engagement	CA/ Complementing Partners
7. USF Institutional Strengthening			
7.1. Enhance the funds' management, resourcing and disbursement	a) A wider and larger pool of the sources of USF contributors towards the fund beyond the usual licensees b) Ensure the contributed funds have been utilised within the stipulated period on the budgeted projects	a) Developed Resource mobilisation plan b) Disbursement framework and plan developed	CA/Consulting Team (Resource Mobilisation)

THEMATIC PRIORITY	THEMATIC OUTCOME	INTERVENTIONS	LEAD SECTOR/ INSTITUTION
7.2. Enhance and build capacity to handle the MEL	a) A MEL framework to manage project implementation, monitoring and learning b) Established working relationships with other institutions and organizations or even local resources to assist in data capturing and monitoring of indicators	a) Establish a standard MEL component where CA can handle some indicators with assistance on some of the external indicators done by external partners b) Establish a framework for external assistance	CA/Consultants (MEL)
7.3. Capacity Build USF Department with relevant equipment and technologies to enhance the quality of service monitoring	a) QoS provision to the USF related areas	a) Acquire relevant technologies or equipment to monitor QoS at the USF related areas	CA/Vendors (QoS)
7.4. Enhance by use of technology to conduct access gap studies	a) Use of technology to address issues of gap areas b) The use of GIS and other supportive technologies should lighten the frequent sites visits to establish gap areas	a) Acquire the relevant technologies for conducting access gap studies and identify gap areas	CA/Vendor (Access Gap Study)

1.2. Indicators Monitoring Matrix

	OUTCOME	OUTCOME INDICATOR	UNIT	BASE-LINE	MID TARGET	END TARGET	RESPONSIBILITY FOR REPORTING	DATA SOURCE (M0V)
1	Out of School Youth are familiar, have skills and confidence with digital services. They can utilise their skills for livelihood	Morans with better skills in digital services Morans utilising skills for livelihood	#	TBD	TBD	TBD	Training Institution	No of Moran
2	A women population that use digital services and gadgets that fits their design and usability	Women utilising digital services	#	TBD	TBD	TBD	Women based institutions contracted to handle the indicator	No of women
3	Established ICT centres that increase usage and enhances co-designs for women contents	Better solutions for women	#	TBD	TBD	TBD	ICT vendors handle innovation for women	No of women solutions
4	A better understanding of the needs, motivations and barriers of PWDs to devise better ways to serve them	Better solutions for PWDs	#	TBD	TBD	TBD	ICT vendors handle innovation for PWDs	No of PWDs products
5	A disability inclusion environment with eliminated discrimination	PWDs included in ICT solutions and technology	#	TBD	TBD	TBD	ICT vendors handle innovation for PWDs	No of PWDs solutions and technology
6	A tech-savvy youth that utilizes its skills in providing local social-economic solutions	Established Tech Hubs for the youth	#	TBD	TBD	TBD	ICT vendors handle innovation for tech-savvy youth	No of tech hubs and community networks

	OUTCOME	OUTCOME INDICATOR	UNIT	BASE-LINE	MID TARGET	END TARGET	RESPONSIBILITY FOR REPORTING	DATA SOURCE (M0V)
7	A youth that works on digital programs that have local context friendly	Local content and applications for the social-economic benefit of the local context	#	TBD	TBD	TBD	ICT vendors handle innovation for tech-savvy youth	No of tech hubs and community networks
8	USF related areas where Quality of services is used as a basis of defining availability and support access to gadgets and complementary services to support use (Airtime, data, etc)	Better Quality of service provision to the USF related areas Gadgets Complementary services	%	TBD	TBD	TBD	CA	% of QoS offered No of gadgets being used No of centre or options for complementary services
9	Regular Access Gap analysis to ensure coverage is addressed on a more regular basis	Better assessment of gap areas	%	TBD	TBD	TBD	CA	% of gap areas
10	A holistic approach when dealing with USF solutions	Better solutions for USF related areas	#	TBD	TBD	TBD	CA/Collaborating Partners	No of holistic solutions
11	An environment that has utilised ICT as an enabler to the public, private sector and communities) service provision	Better solutions for USF related areas	#	TBD	TBD	TBD	CA/Collaborating Partners	No of e-government solutions

	OUTCOME	OUTCOME INDICATOR	UNIT	BASE-LINE	MID TARGET	END TARGET	RESPONSIBILITY FOR REPORTING	DATA SOURCE (M0V)
12	A wider and larger pool of the sources of USF contributors towards the fund beyond the usual licensees	USF is better and more balance in its finances	#	TBD	TBD	TBD	CA/financing Partners	No of USF funds contributors
13	Ensure the contributed funds have been utilised within the stipulated period on the budgeted projects	USF better utilised	#	TBD	TBD	TBD	CA/financing Partners	Funds disbursed plan/ schedule with timelines
14	A MEL framework to manage project implementation, monitoring and learning	All parameters monitored	#	TBD	TBD	TBD	CA/MEL Partners	No of indicators being monitored
15	Established working relationships with other institutions and organizations or even local resources to assist in data capturing and monitoring of indicators	All parameters monitored	#	TBD	TBD	TBD	CA/MEL Partners	No of MEL partners
16	Use of technology to address issues of gap areas (use of GIS and other supportive technologies should lighten the frequent sites visits to establish gap areas)	Better and cheaper assessment of gap areas	%	TBD	TBD	TBD	CA/Vendor (Gap assessments)	No of access gap reports

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