Best practices and recommendations for digital inclusion through resilient infrastructure

17th Internet Governance Forum @ Addis Ababa, Ethiopia

28 November 2022

COVID-19 Recovery: Rebuilding Digital Inclusion for the Rural Counties of Kenya

- Theme: Digital Connectivity and Resilience
- Presenter: Leonard Mabele, Strathmore University

Presentation Outline

- Research team
- Introduction
- Research methodology
- Research findings and outcomes
- Recommendations
- Conclusions

Research team

- Joseph Sevilla, Strathmore University

- Gilbert Mugeni, Communications Authority of Kenya (CA)

- Edward Wasige, University of Glasgow

- Kennedy Ronoh, Technical University of Kenya.

Introduction

Background

The COVID-19 pandemic disrupted learning to 18 million students in Kenya starting the week of 16th March 2020.

Rural schools could not sustain their learning programmes with the shift to online learning.

The pandemic exposed the challenge of connectivity that the healthcare ecosystem also faced.

Lack of eHealth collaboration shown to also exist. to allow information exchange and sharing.

This research investigated the state of connectivity for the rural schools and healthcare centres of Kenya before and during the COVID-19 pandemic and the mechanisms to enhance it.

Two rural counties were taken as case studies: Kakamega and Turkana.

Turkana

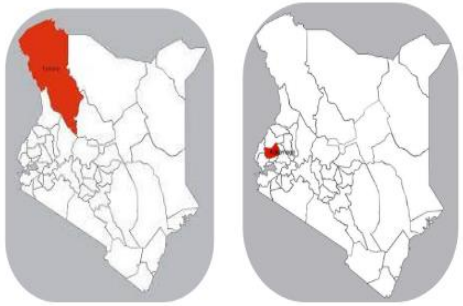
Machakos

Kakamega

The research, further, sought to identify befitting broadband opportunities to rebuild digital inclusion for the rural counties. This was done through:

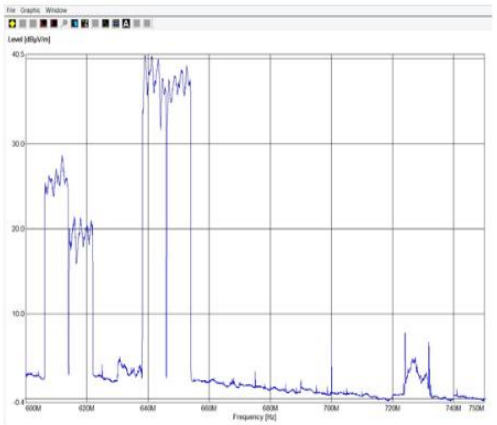
1. Assessment of new regulatory frameworks.
2. Measurements of radio frequency (RF) to establish the extent of spectrum scarcity for contextual spectrum innovation.

Research methodology



Kakamega and Turkana counties of Kenya are a part of the major rural areas of Kenya that were heavily affected by the COVID-19 pandemic. Our research investigated the level and opportunity of connectivity for schools and healthcare facilities in these two counties.

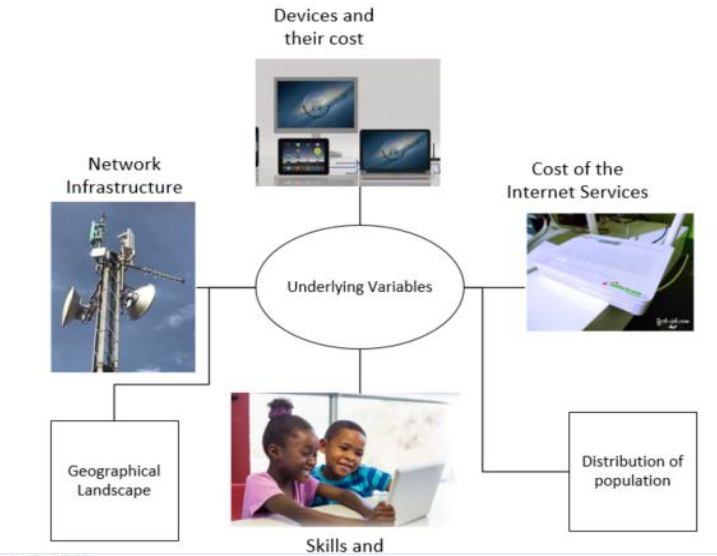
We conducted a desk review research, field surveys in Kakamega County by visiting a set of schools and healthcare facilities, engaged Internet Service Providers (ISPs) and also carried out spectrum measurements as part of our research methodology.



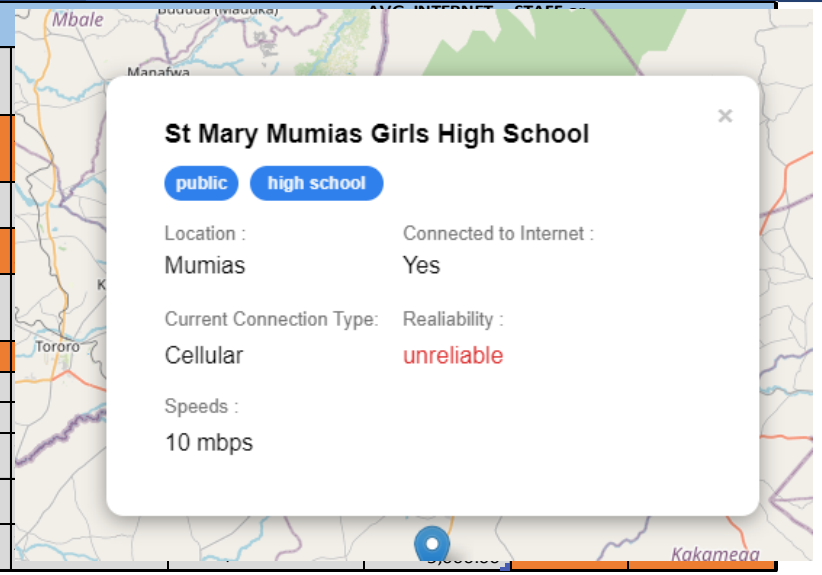
While identifying the variables impeding meaningful rural Internet access, we also unearthed an opportunity through spectrum sharing that can be supported by policy and technical demonstrations to rebuild rural Internet access.

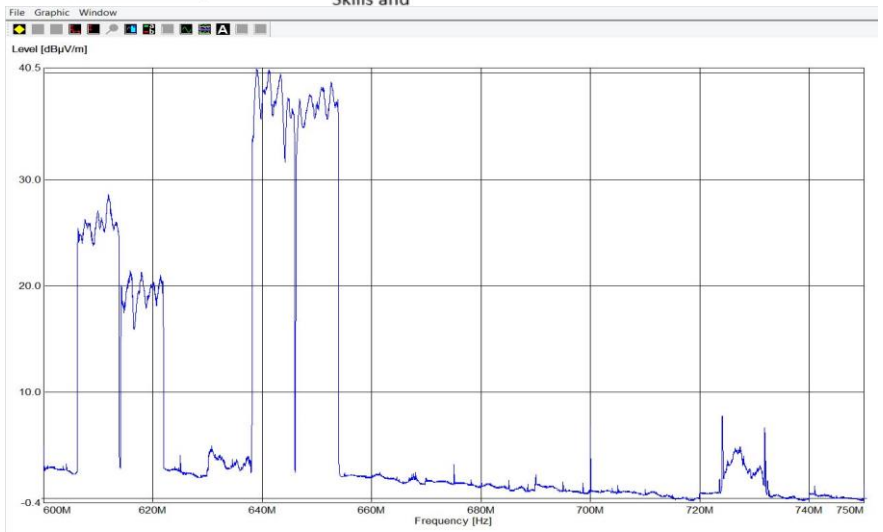
- Desk Research – Study of secondary resources on the state of connectivity and digital
- Infrastructure in Kakamega and Turkana counties.
- Site surveys to a set of schools in Kakamega and Machakos counties.
- Stakeholder engagements through questionnaires with selected Internet Service Providers (ISPs).
- Spectrum measurements through an RF measurement vehicle.

Research findings and outcomes



KAKAMEGA COUNTY - VISITED SITES	SUB-COUNTY	CONNECTIVITY TECHNOLOGY IN USE	GPS_LAT	GPS_LON
SHEYWE COMMUNITY HOSPITAL	LURAMBI	FIBRE	0.206061	34.772065
KMTC_KAKAMEGA	LURAMBI	FIBRE & SATELLITE	0.27272	34.758667
ST MARY'S MISSION HOSPITAL MUMIAS	LURAMBI	FIBRE	0.283757	34.752353
KAKAMEGA ORTHOPAEDIC HOSPITAL	LURAMBI	FIBRE	0.29141	34.756159
MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY	LURAMBI	FIBRE	0.292625	34.762434
EKAMBULI PRIMARY SCHOOL	KHWISERO	NONE	0.107153	34.571447
MUNDOLI PRIMARY SCHOOL	KHWISERO	NONE	0.11143	34.58086
EMUKHUNZULU PRIMARY SCHOO	KHWISERO	NONE	0.370096	34.598745
ST. ELIZABETH SCHOOL OF NURSING	LURAMBI	MICROWAVE	0.21365	34.77068
ST. MARTHA'S MWITOTI SECONDARY	MUMIAS EAST	CELLULAR BROADBAND (4G)	0.32859	34.52735
ST. MARY'S MUMIAS GIRLS HIGH SCHOOL	MUMIAS WEST	CELLULAR BROADBAND (4G)	0.4708	34.53766





- Most schools and healthcare facilities significantly affected by the pandemic: Link.
- Millions of students could not sustain learning – challenges of power and connectivity.
- Lack of sufficient information on the coverage by the various access technology options.
- Cost of mobile data seen as relatively high.
- Significant amount of “dark fibre”.
- Outdoor Wi-Fi unreliable for the institutions.
- ISPs experienced challenges during the pandemic and also unfamiliar with new frameworks.
- Opportunity of implementing newer regulatory frameworks to reach the unconnected.
- Opportunity of spectrum sharing also identified.

Recommendations

- Investment in affordable off-grid power for connectivity need to be supported for the rural areas.
- A proper mapping on connectivity needs vs infrastructure ought to be done for the institutions to tap into the existing “dark fibre”.
- Initiatives that can enhance Wi-Fi access to the institutions (including outdoor access) need to be implemented.
- Sector statistics reports from CA on connectivity to be made comprehensive in order to know to what extent the various access options have covered the rural areas and where limitations exist.
- Contextual connectivity studies to be carried out, particularly as spectrum sharing evolves.
- Provision of online platforms should be integrated within the Community Networks (CNs) framework.

Conclusion

- The “new normal” is not normal if Internet access lacks even for the rural communities.
- More work needs to be done to appropriately determine connectivity needs vs available infrastructure.
- Near future studies to exploit “dark fibre” for a set of schools (including TVETs) and healthcare centres should be done.
- Initiatives on Community Networks (CNs) need to be supported and clearly designed on how they can fit in the rural communities.
- More funding is needed to the studies that are looking into Internet access initiatives.
- Launching a new study that is unbiased on acess technology options can be a great next step.