2022 GLOBAL SUMMIT DSA

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Day 2

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Digital Access Programme: Increasing Spectrum Availability For Affordable Connectivity For Those That Are Still Unserved and Underserved

DSA
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- Artur Coimbra, Commissioner
  ANATEL, Brazil
- Dennis Sonoiya, Engineer I / Frequency Spectrum Management
  Communication Authority (CA), Kenya
- Yolisa Kedama, Councillor
  ICASA, South Africa
- Tim Genders, Chair
  Wireless Access Providers Association (WAPA)
- **Moderator** : Martha Suarez
  President, Dynamic Spectrum Sharing

DIGITAL ACCESS PROGRAMME

FOREIGN, COMMONWEALTH & DEVELOPMENT OFFICE and DYNAMIC SPECTRUM ALLIANCE

14 September 2022

Dynamic Spectrum Alliance

The Dynamic Spectrum Alliance (DSA) is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all

DSA Members

Digital Access Programme

Is a UK Government Prosperity Fund partnership between DFID, FCO and DCMS covering 5 countries

- Department for International Development
- Foreign & Commonwealth Office
- Department for Digital, Culture, Media & Sport

It aims to support inclusive, affordable, but also safe digital access for underserved communities to increase the basis of digital tech economy for opening skilled jobs and opportunities for local government

DSA – DAP Project

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DSA / DAP Project Scope

"Increasing spectrum availability for affordable connectivity for those that are still unserved or underserved"

Making spectrum more available, more affordable, so it will increase affordable broadband connectivity.

Progression summary

What DSA achieved so far

- Economic value of unlicensed use of 6 GHz band.
- Definition of local partners
- Workshops with stakeholders.
- Spectrum framework Gap Analysis, initial draft under DSA review.

What DSA is currently doing

- WISPs studies.
- E-learning courses
- Technical coexistence studies
- Technical advise and support

Evaluating the gap

The Digital Spectrum Access Initiative gap analysis studies were conducted to assess the maturity level of the National Regulatory Agency's (NRAs) spectrum management framework for adopting regulations to incorporate dynamic spectrum access and provide recommendations to address any identified barriers.

The study was completed by carrying out both desk research (secondary research); where we reviewed previous research findings to gain a broad understanding of the field of DSA, and by use of a questionnaire/interviews (primary research), along with organising industry stakeholder workshops. The findings were shared with stakeholders.

In this presentation we depict the methodology and the outcomes of the Gap Analysis studies.
Inspired by the report "Taking Stock of Spectrum Sharing" published by John Leibovitz and Ruth Milkman, which distilled six principles that are essential to a successful spectrum sharing policy, we assessed the countries' gaps against modern spectrum management practices.

We enhanced and expanded the principles and produced ten principles covering technology, market and policy. We then considered the principles in relation to the country specific context and assigned to each a qualitative score from 1 (i.e., the principle is not followed) to 5 (i.e. , the principle is followed, and specific actions have been successfully taken) to assess how the principle is taken into consideration and successfully applied.

The overall assessment have finally been used to provide NRAs and country governments with policy recommendations.

The ten principles for successful spectrum sharing

1	Develop interference expectations	Sharing regimes should be informed by reasonable interference expectations, developed using modern analytics, rather than worst-case analysis.
2	Encourage standards and technologies that facilitate sharing	Sharing can be facilitated through private sector development of cross-industry "meta standards," designed to be agnostic as to the underlying radio technologies used for transmission.
3	Encourage automated coordination	The complexity of managing spectrum grows as its demand increases. Furthermore, when multiple users share the same band, the additional complexity of coexistence requires clear rules which can be efficiently implemented by automatic coordination systems. Crucially, the efficiency of automated approaches is greater when accurate datasets are used (see Principle 10) and when pragmatic and transparent coexistence rules are implemented.
4	Build in enforcement mechanisms	Enforcement is necessary to ensure various stakeholders trust the sharing mechanism.
5	Avoid artificial scarcity	Spectrum "scarcity" is often a by-product of regulation. Wherever possible, the default should be rules that promote the abundance of spectrum through spectrum re-use.
6	Avoid "Trojan Horses" for market power	No single private entity should hold the key to enabling a centralized shared spectrum policy.
7	Develop a competitive market on a micro-scale	Connectivity is first and foremost a social driver (which, of course, translates to economic growth, etc.) and too often regulators describe a market competitive from a macro scale instead of a micro scale. If instead of having Governments aiming to have three nationwide connectivity providers, the goal was that every citizen should have access to three connectivity providers in the place they live and the place they work (during the commute would be great too), then the concept of "competitive connectivity market" would be based on the micro-scale instead of macro. This change of mentality would likely drive changes in the way connectivity plans are designed, favouring local and well-defined projects to huge nation-wide ones, which are often left undelivered.
8	Develop flexible frameworks	A successful framework should acknowledge the social-economic differences across the country (for example, urban and rural, but there can be many others) which generate very different connectivity dynamics and create favourable conditions across the country. In order to do so, it is important that the frameworks are flexible and can be tuned to better deliver connectivity.
9	Promote sharing by design	Promote sharing by design, particularly in bands in which there are no incumbents. Modern spectrum policy should have a sharing-first approach whereby exclusive use of spectrum needs to be explicitly justified from an economic and social point of view and granted in terms of maximum interference that that user can tolerate from other users.
10	Ensure integrity and accuracy of datasets	NRAs need quality information to take policy decisions based on data and therefore ensure effective use of spectrum. For spectrum sharing, the effectiveness of any framework is constrained by the quality of the datasets – whether they represent geographical information (such as terrain, clutter, etc.) or use-related information (such as locations and characteristics of the incumbents to be protected). Importantly, as datasets are only snapshots in time of specific information, it is necessary to design, budget, implement processes that ensure data integrity and that allow for improvement of data accuracy.

BRAZIL

- **Monitoring –** Ongoing monitoring of Anatel's Spectrum agenda and future decisions to anticipate any changes that would be strategically relevant to spectrum management.
- **Advocacy –** Pursue an advocacy engagement strategy with the new President, Commissioner and Spectrum Manager. The purpose is to brief them on work completed to date and appraise them of the FCDO and DSA's willingness to support on matters relating to dynamic shared access spectrum issues. Ongoing close engagement with the Spectrum Superintendence and Competition Superintendence from a technical aspect as well.
- **Public Consultations -** Participate in the Public Consultation for the new RUE (2H2022) and the public consultation on the PGMC review (2H2022). A public position on the upcoming public hearings, workshops and events should also be considered. This will involve engagement with Anatel and with the ISP community and other supporting voices.
    - Participate in the Public Consultation about TVWS Databases and technical operation parameters.
- **Third Party Alliances & Policy Communications –** Work closely with ISP's following the publication of the RUE's Public Consultation document. It is expected that ISPs would seek to include DSA technologies into the regulatory framework. The DSA will work closely with Brazilian industry associations that represent regional and smaller operators & internet providers to develop joint positions and approaches to Dynamic Spectrum Sharing by acting as an intermediary between these stakeholders and the regulator to achieve positive outcomes.
    - Furthermore, on TVWS, DSA is actively collaborating with Nic.br and Fairspectrum to share its expertise and experience on the development of TVWS solutions, with the purpose of accelerate adoption and networks deployments once the regulations are in place.
- **Implementation of Capacity Awareness Programmes –** Assist Anatel on creating stakeholders' awareness of their existing regulations enabling dynamic spectrum access.
- **WISPs and other stakeholders' engagements**: Finalize the WISPs study and present it in a public event, so it could be used as an input for public policy decisions.
- **Automated Frequency Coordination Systems**: Technical support to Anatel on their plans to authorize outdoor standard power devices in the 6 GHz band in Brazil, organizing workshops, demonstrations and preparing technical material.
- **International activities**: Technical support to Anatel to lead regional activities at CITEL in order to achieve a regional recommendation in the Americas for the harmonization of technical parameters of WAS/RLANs in the 6 GHz band.

KENYA

1. **Monitoring** – In collaboration with the Strathmore University, assist CA by means of more research, information engagements sessions and areas of collaboration so that their spectrum sharing strategies and qualification procedures, type-approval requirements, related policies and spectrum allocations are transparently shared with the Stakeholder ecosystem.

2. **Authorisation of New Entrants –** Work with CA to formalise the new licensing category for small telecommunication service operators under the Unified Licensing Framework that would encourage new market entrants as part of accelerating universal broadband access & adoption and advancing national purposes such as Education & Health Care.

3. **Implementation of Capacity Awareness Programmes –** Assist CA to engage with existing Stakeholders to create awareness of the advantages of dynamic spectrum access (DSA) by means of a holistic awareness plan.

4. **Use of the Universal Service Fund –** Assist with the Development of a Strategic Plan that would support the deployment of not-for-profit Community Networks (CNs) and other broadband initiatives. Potentially the USF could also be repurposed to strategically support TVWS pilot network deployments.

5. **DSA Blueprint for Kenya –** Assist with drafting a blueprint which details the opportunity of DSA in different spectrum bands and enables stakeholders to relate on its applicability or use in the new frameworks such as TVWS and the Community Networks. This blueprint must remain complementary to the existing CA strategic plan ending in 2023 and should stimulate contextual R&D developments by different stakeholders as well as collaborations that would rapidly drive the understanding and adoption of DSA.

6. **Access to White Space Data –** Assist CA with establishing guidelines as to the custody of data within the geolocation database. This data should be made available to researchers and relevant parties who can examine the performance of the TVWS network and even develop predictive models that can enhance future spectrum sharing initiatives and ultimately the quality of utilisation of the TVWS channels.

7. **TV White Space Listing Server –** Assist CA in finalising their decisions regarding who should operate the Spectrum database, who should pay for it and how it should be deployed operationally. Ideally these decisions should reduce the complexity of operating networks and support the commercial rollout of TVWS in Kenya.

8. **TV White Space Geolocation Databases and Guidelines and Policies -** Assist CA in forming and publishing their long-term position on the availability of TVWS Spectrum, as well as the Development of Supportive guidelines and policies on stakeholder collaboration, capacity building, requirements for new entrants, backhaul access and usage of TVWS for Community Networks (CNs) or other not-for-profit last mile networks, spectrum fee schedule and technical coexistence requirements.

- **WISPs** and other stakeholders' engagements: Finalize the WISPs study and present it in a public event, so it could be used as an input for public policy decisions.
- International activities: technical support to CA on drafting a contribution and sharing the results of the technical coexistence studies in the 6 GHz band at the regional level.

INDONESIA

1. **Monitoring –** Ongoing monitoring of Kominfo's Spectrum agenda and future decisions to anticipate any changes that would be strategically relevant to spectrum management.
2. **WISPs and other stakeholders' engagements**: Finalize the WISPs study and present it in a public event, so it could be used as an input for public policy decisions.
3. **Implementation of Capacity Awareness Programmes:** assist Kominfo to engage with existing Stakeholders to create awareness of the advantages of dynamic spectrum access (DSA) by means of a holistic awareness plan.
4. **Understanding of the benefits of extending unlicensed spectrum access in the 6 GHz band:** Assist WISPs and service providers in general with their planning for the opening of the 6 GHz band as unlicensed spectrum.
5. **Private-public sector collaboration:** Continue the engagement with the regulator of radio spectrum and agencies dedicated to the achievement of Industry 4.0 in Indonesia.
6. **Coexistence studies:** Technical support to Kominfo and a local university in Indonesia on having their own technical studies about coexistence of WAS/RLANs systems with incumbents in the 6 GHz band. This would benefit from the successful experience of such a study in Kenya in collaboration with the Strathmore University.
7. **Automated Frequency Coordination Systems**: Technical support to Kominfo on their revisions of Automated Frequency Coordination systems, organizing workshops, demonstrations and preparing technical material as needed.

NIGERIA

1. **Capacity Building and Training:** DSA to deliver training courses on proactive management of interference through modern analytics for relevant staff of the NCC.
2. **Continued Engagement:** Work closely with NCC to ensure timely implementation of the ATU Emerging Technology Recommendations on Lower 6 GHz band. This would take place using the Public Consultation process and would support the wider ISP ecosystem to ensure they have the latest Spectrum Sharing information to support their own advocacy work.
3. **Micro-scale competitive market analysis:** Perform a study on the micro scale concept and its benefits that would be shared with NCC for its consideration and possible adoption as it relates to their roll out targets for the Nigerian National Broadband Plan 2020 – 2025.
4. **Study on Publication of Spectrum Licence Data:** Submission of a formal motivation to NCC to publish spectrum licence data regularly for stakeholders' information in-line with International Best Practice. The Study would be focussed on other countries (at least in Africa and Asia) that have adopted such Best Practice.

SOUTH AFRICA

1. **Monitoring:** Closely follow ICASA's current and future decisions on spectrum management to identify opportunities for dynamic spectrum access advocacy.
2. **Knowledge exchange**: Arrange a workshop with ICASA to discuss the Gap Analysis in more detail and implications for future spectrum management.
3. **Additional unlicensed spectrum in South Africa:** Continued monitoring of ICASA's position on the 6 GHz band and support the implementation of licence-exempt access to the lower 6 GHz band. Respond to public consultations relating to the 6 GHz Spectrum band and continue to present the evidence and rationale for allowing licence-exempt access to the entire 1200 MHz bandwidth of the 6 GHz band. Present the results of 6 GHz sharing studies as applicable.
4. **Sectoral Partnerships -** Work closely with the main local industry associations that share interest in dynamic spectrum sharing such as Wireless Access Providers Association (WAPA), and South African Communications Forum (SACF). Explore opportunities to form a local South African coalition on Dynamic Spectrum Sharing.

Shared Spectrum for Community Networks in Kenya

UKaid from the British people

University of Strathclyde Glasgow

APC Association for Progressive Communications

DSA Dynamic Spectrum Alliance

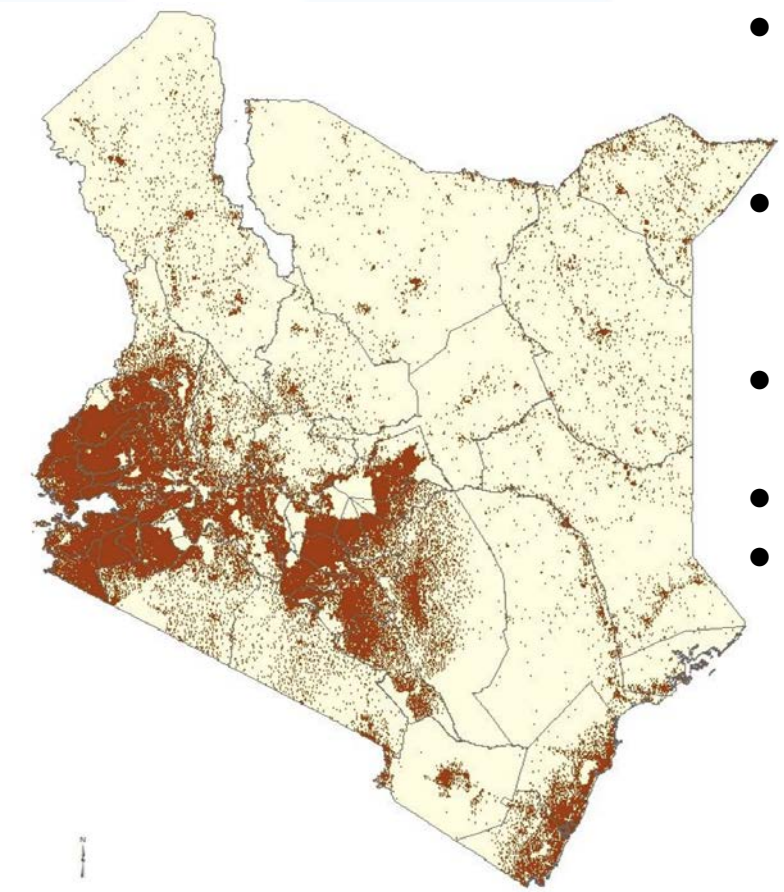
Communications Authority of Kenya

Strathmore University

KICTAnet Kenya ICT Action Network

Fairspectrum

Statistics : Kenya's Inclusive Digital Transformation??



Map of Kenya's Population Distribution
Source: Kenya National Bureau of Statistics, 2020

- 22% of Kenyans used digital services to access only basic digital services limited to sending/receiving money, buying airtime and data using mobile money.
- 85% of rural residents with non-primary education, 45% people with disabilities and 44% of older people across are basic digital services users or non-users.
- 35% of women are advanced digital services users, compared to 54% of men.
- Inequalities accelerated by the COVID-19 Pandemic.
- Several key challenges limit basic digital services users to the use of mobile money:
  - 69% of basic digital services users have no regular access to the internet.
  - 95% basic services users have only basic phones.
  - 54% cannot afford to pay for internet connection.
  - 69% need help to use digital services, and
  - 71% who use shared devices are allowed less time than other family members to use digital services.

Source:
https://digitaleconomy.ke/assets/download/Kenyas_Digital_Ecomony_Full_report_Aug_2021.pdf

Lack of Infrastructure

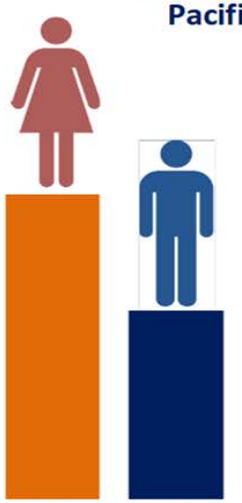
Non-Affordability

Lack of Skills

Lack of Digital Content

Source: "Working Together to Connect the World by 2020 – Reinforcing Connectivity Initiatives for Universal and Affordable Access", available from: www.broadbandcommission.org.

The Gender Gap is most pronounced in Africa, the Arab States and Asia-Pacific



Half have a GNI/capita of < US$ (PPP) 6,500, a large proportion of which are located in Africa and Asia-Pacific

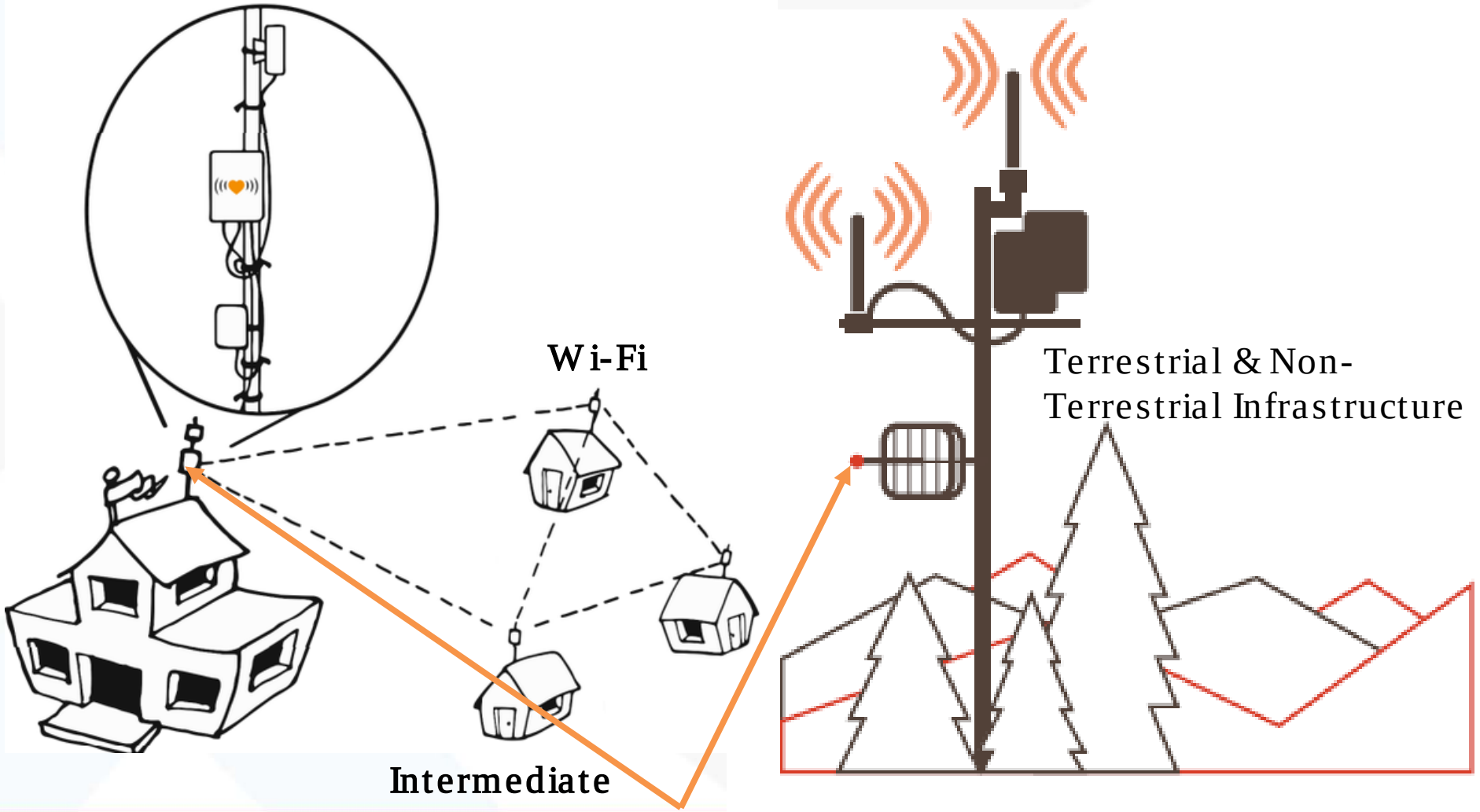
60% live in rural areas, of which a large proportion is located in Africa and Asia-Pacific

The elderly have much lower Internet penetration levels than the overall population across all regions

Individuals with low educational attainment often remain unconnected across all regions

Source: www.BroadbandCommission.org

Diversity in Technologies for Community Networks



Community Networks: Socio-Economic Impact

Community Network Service Provider

Licensing

- ★ For Cooperative societies, Community-Based Organisations and Non-Governmental Organisations.
- ★ Limited in geographic scope to a division (sub-county).
- ★ License term of 10 years with simplified application requirements and fit-for-purpose quarterly compliance reporting.

Spectrum

- ★ Fee waiver for access to spectrum.
- ★ Planned regulatory sandbox for local shared spectrum access for small operators.
- ★ Planned framework for dynamic access to IMT spectrum.

- Local control over how the network is established and operated.
- Attention to gender & age gaps and community needs → Covid19 response
- Fostering the digital ecosystem: production of content, skills, etc.
- Lower costs and retention of funds and skills in the community.

Framework: https://www.ca.go.ke/public-consultation-on-draft-licensing-and-shared-spectrum-framework-for-community-networks-in-kenya/

2022

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6 GHz WiFi key to uncap Africa

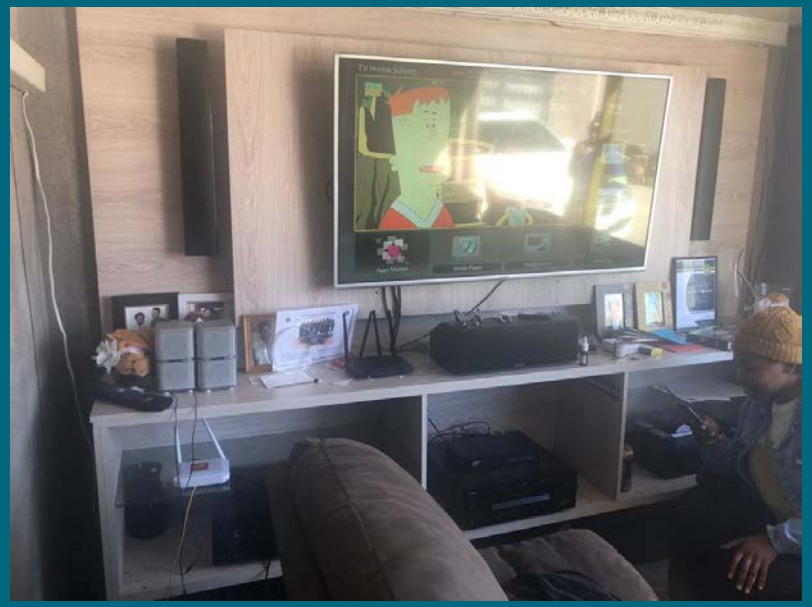
Sep 12-14, 2022 |Paris, France

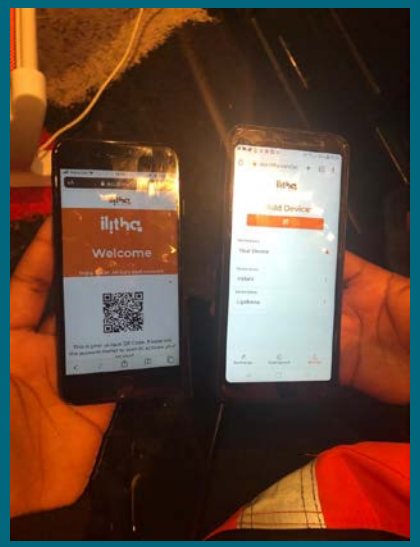
WiFi uncapping Africa

Project Isizwe

WIRELESS ACCESS WAPA PROVIDERS' ASSOCIATION

Pay as you go fibre





Questions?

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