Stakeholder Engagement II Report: Engagement with the Public Institutions, Policy and Spectrum Lobby groups in Kenya

Work Supported By

The Dynamic Spectrum Alliance (DSA)

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1. Overview

This report is a summary of the workshop conducted on 11th March 2022. The workshop was held virtually via the Microsoft Teams platform. It was the second workshop on engaging relevant stakeholders on the state and potential of spectrum sharing in Kenya. While the preceding workshop held on 21st January 2022 was with Wireless Internet Service Providers (WISPs), this second workshop engaged public (government) institutions, the regulator (Communications Authority of Kenya - CA), ICT policy advocacy groups such as KICTANet and the general public made up of researchers as well as students. Notably, some WISPs, both local and from around Africa were also able to join the workshop. The workshop's main focus was to present our findings on Gap Analysis on Spectrum Sharing (SS) in Kenya and also share studies and experiences of the opportunity of spectrum sharing across the world, particularly through TV White Spaces (TVWS) and the latest developments on the Wi-Fi 6/6E.

2. The Workshop

The workshop was attended by 35 participants[1] and featured various presentations as well as a question and answer (Q&A) session at the end which obtained active participation from the participants with the presenters sharing their perspectives as well as providing clarifications on the presentations. Largely, the questions from the stakeholders were based on the need to properly understand the present state of TVWS in Kenya and any initiatives of deployment as well as the value and initiatives on the 6 GHz Wi-Fi.

The list of the presentations and the presenters is included here. All the presentations have also been made publicly available through a Google Drive shared under the Annex section of this report.

1. The Digital Access Program (DAP) and initiatives to enhance digital inclusivity by the Foreign Commonwealth and Development Office (FCDO) – presented by Michael Kahindi.
2. Gap Analysis on Spectrum Sharing in Kenya by Strathmore University – Presented by Leonard Mabele.
3. The Global Perspective of Spectrum Sharing by the Dynamic Spectrum Alliance (DSAL) – Presented by Martha Suarez.
4. Opportunities of Spectrum Sharing through TV White Spaces and Wi-Fi 6 by Strathmore University – Presented by Kennedy Ronoh.
5. Strategic Roadmap for Spectrum Sharing in Kenya by the Communications Authority of Kenya (CA) – Presented by Tom Olwero.
6. Policy Initiatives and Contributions to Spectrum Sharing by KICTANet – Presented by Josephine Miliza.
7. The African Telecommunications Union (ATU) Perspective on the 6 GHz Wi-Fi – Presented by Gababo Wako, representing the ATU taskforce on the 6 GHz Wi-Fi.

[1] The link to the list provided in the Annex of this document

3. Highlights of the Workshop

3.1. Gap Analysis on Spectrum Sharing

The presentation on Gap Analysis showed the stakeholders the present state of connectivity across the country and the existing disparity between the urban and the rural areas. Notably, with the present population of 55.6 million people in Kenya, Internet penetration stands at 42% albeit it is hard to actually get the accurate datasets for the country in terms of the network connectivity technologies juxtaposed with the key data such as population density as well as geographical terrain, middle-mile networks and the electricity coverage. 29% of the population lives in the urban areas while 71% in the rural areas[2]. Issues of cost and affordability remain a challenge that disproportionately affect the unserved and the underserved. Therefore, in the analysis of the gaps on spectrum sharing, **Economics** was considered a key variable of study with such user-facing challenges. The other two variables included Technology and Regulations. The **Technology** variable underscoring the available connectivity technologies, backhaul networks, state of electricity, contexts of Internet access (i.e. connectivity for schools or other institutions being different from individual or home access) and unused frequencies while the **Regulations** variable highlighting the latest policy formulations and recommendations on spectrum sharing and their limitations to leapfrog Universal Broadband Access in the country.

During the workshop, a few questions came up in regards to the present state of TVWS especially with Kenya's TVWS regulations in place and what could be the impeding factors at this point. From the first workshop, we noted a lack of enthusiasm and inactive participation by the potential stakeholders to deploy TVWS. The same mood was felt during this second workshop but the lack of understanding on the enacted regulatory framework as well as the technology seemed to exist conspicuously. The existing developments on TVWS in Kenya, at the time of the workshop, had not yet advanced to commercial uptake. Nevertheless, a representative from Nigeria was keen to collaborate with groups in Kenya on TVWS deployments as a benchmark for potential rollout of TVWS in Nigeria.

On the other hand, there was also curiosity to understand the technology, value and impact of Wi-Fi 6/6E as it is not well understood by the majority of the stakeholders at the moment. During the workshop, the CA presented a detailed plan on spectrum sharing including opening up the lower 6 GHz band (5925 – 6425 MHz) for license-exempt access, adopting the recommendations from the Africa Telecommunications Union (ATU). While this demonstrates the strategic steps by the regulator to increase Wi-Fi capacity and unlock more spectrum for Dynamic Spectrum Access (DSA), it also sets the stage to assess the most suitable approach of enacting the regulations that would optimally derive value from the 6 GHz band for unlicensed usage. For instance, it would be great to obtain a detailed rulemaking from the regulator on the decision to open the lower 6 GHz band with inclusion of consideration to the economic study that has already been conducted in Kenya in the full 6 GHz band (5925 – 7125 MHz).

[2] Datareportal - Digital 2022 - Kenya

3.2. Opportunities of Spectrum Sharing for Kenya – TV White Spaces and the 6 GHz Wi-Fi

The presentation on "Opportunities of Spectrum Sharing through TV White Spaces and Wi-Fi 6" by Strathmore University outlined a list of use cases and opportunities of TV White Spaces (TVWS). This included:

1. Rural Internet access due to the great propagation features of the UHF band even in Non-Line-of-Sight (NLOS) conditions.
2. Backhaul opportunity for last mile networks or community networks.
3. Internet of Things (IoT) – both as a backhaul and edge network.
4. Cellular traffic offloading, particularly for densely populated areas and peak times.

The Dynamic Spectrum Alliance, while presenting on the overall umbrella of the project "Enhancing Affordable Broadband Connectivity through Spectrum-Sharing and Facilitating Inclusive Growth of the Local Digital Ecosystem," highlighted the global progress of TV White Spaces as shown in figure 3.1 below. The presentation underlined the level of readiness of Kenya and referenced CA's approval list of an authorised geolocation database provider in Kenya.

Figure 3. 1: TV White Space Global Progress

Source: Dynamic Spectrum Alliance

Moreover, DSAL's presentation featured the existing opportunities of Wi-Fi 6E/Wi-Fi 7:

1. High-bandwidth Internet access which would befit the demand of content users.
2. Augmented Reality / Virtual Reality / Mixed Reality
3. Cellular traffic offloading and location applications.
4. Internet of Things – More cases of smart homes, smart environments etc. as well as a backhaul to an unlicensed low power wide area network (LPWAN) such as LoRaWAN.
5. Expansion of connectivity to the underserved communities.
6. Public Wi-Fi access to consumers.

3.3. Spectrum Sharing in Other Bands

Based on the presentation by KICTANet, the enactment of the framework for Community Networks (CNs) in Kenya provides better clarity for CNs deployment in the license-exempt spectrum of 2.4 GHz and 5 GHz Wi-Fi for Point-to-Point (PtP) and Point-to-Multipoint (PtMP) use and cements the value of extending Wi-Fi access to underserved communities under revised Effective Isotropic Radiated Power (EIRP) limits. While this enhances efficiency of the CNs in the 2.4 GHz and 5 GHz, the CA has also made it deliberate to review options for lowering the barrier to use of other license-exempt bands for PtP and PtMP use to include 24 GHz and 60 GHz extending DSA implementation.

Other bands identified for spectrum sharing studies for Kenya as witnessed in other places such a South Africa, the United Kingdom and the United States (US) include a range of IMT spectrum in the 900 MHz, 1800 MHz, 2390-2400 MHz, 3.8-4.2 GHz, 24.25-26.5 GHz, 3550-3700 MHz (for the Citizens Broadband Radio Service - CBRS in the US). CBRS is an example of a Tiered Shared Access (TSA) which refers to a sharing model whereby different users have different priorities and licensing means to access spectrum. Key to realising the fruits of sharing (including TSA) in all these bands is the determination of coexistence to ensure that protective mechanisms for the incumbents are sufficiently implemented as presented by the DSAL. This means that more research needs to be conducted for Kenya, even as potential bands for sharing are identified in order to ascertain the confidence level of coexistence that can sustainably support spectrum sharing initiatives in such bands.

4. Recommendations Based on the Stakeholder Engagement

Similar to the first Stakeholder Engagement Workshop, this workshop still elucidated a need to organise capacity building initiatives to further enhance the understanding of spectrum sharing and the regulatory frameworks that have currently been enacted in Kenya under spectrum sharing i.e. Authorisation of the use of TV White Spaces and the Licensing and Shared Spectrum framework for Community Networks. The latest developments on Wi-Fi 6/6E as well as Wi-Fi 7 should also be included in those initiatives to enable the stakeholders understand the opportunity of the license-exempt access of the 6 GHz band and the technology frameworks that currently exist in that band. The initiatives would derive more value from the contribution of the Communications Authority of Kenya (CA) in terms of content, particularly pertaining to the potential developments of the frequency bands being considered for dynamic spectrum access (DSA). This will enable stakeholders and new entrants to be ready for any opportunistic spectral deployments that the CA might identify in other bands in the near future.

5. Annex

1. List of Stakeholders who attended the workshop - https://drive.google.com/drive/u/0/folders/1NkUogXO33Ufcv-PYqBtZhhE0auWg5pZD
2. Presentations and Recording of the workshop - https://drive.google.com/drive/u/0/folders/1zrXebe6pO1MTG9segwE-NpY-TuUzpxSt