

Open Spectrum for Development: *Findings from an exploratory study on approaches to spectrum assignment and management in Kenya*

Abiodun Jagun
University of Witwatersrand
South Africa
abiodun.jagun@wits.ac.za

Muriuki Mureithi
Summit Strategies Ltd.
Kenya
mureithi@summitstrategies.co.ke

Background & Context of the study

- Fibre – undersea and terrestrial pervasive
 - wireless technologies offers tremendous potential to deliver affordable and pervasive broadband access to rural areas
 - *concern* - inefficient spectrum policy and regulation means that the opportunity to seize these advantages is extremely limited.
 - *Concerns on availability of spectrum and has led to conclusions that unless the ways in which spectrum is currently managed changes, the world is faced with an imminent scarcity of this important resource (Jabbari et al 2010)*
-

Introduction

to document how spectrum is allocated and managed as a means of identifying and/or understanding **barriers** to “open spectrum” and spur activity aimed at reducing such barriers. The aims of the studies are to:

- Raise awareness of what's at stake in the regulation of the frequency spectrum (on the basis of what the research reveal)
 - Act as a tool for advocacy around new and different approaches to spectrum regulation - the open spectrum approach or spectrum commons approach and the pooled spectrum approach
 - Examine arguments that proclaim the scarcity of spectrum
 - Contribute to the development of a citizens guide to the airwaves
-

Research design and methodology

- Areas investigated were:
 - i) the authorities and agencies responsible for governing spectrum, their interrelationship(s), and the policy/regulatory framework that guides their work;
 - (ii) the approach(es) used in assigning spectrum and the resulting landscape of operators/service providers; and
 - (iii) plans/commitments made on future assignment of spectrum.
 - Case study approach
 - Interview questions focused on following broad areas:
 - Allocation and regulation of spectrum: who are the decision makers in the allocation and assignment of spectrum, who regulates spectrum, how transparent are the allocation and regulatory processes relating to spectrum etc.?
 - Unlicensed or license-free spectrum: identify unlicensed or license-free bands and the implications their management has on (community) wireless networks
-

Spectrum management regimes

- *Command & Control*
 - centralised, *top-down approach* where government directly “controls the choice of technology, spectrum uses, and users and market forces have limited influence.
- *Licensed regime* (also known as *Property Rights* or *Exclusive Flexible Use approach*)
 - government through its agency determines who should have access to spectrum and confers a ‘*property right*’ to it in the form of exclusive use of the spectrum for a specified period of time.
- *Commons approach*
 - a *decentralised approach* in which the market is allowed to exert its influence. However, here the right to access or use the spectrum is not exclusive to an individual entity but is “shared among the users subject to a *protocol, etiquette, or framework* (Protocol) that embodies the mechanism for managing the spectrum”

Lehr and Crowcroft (2005)

Findings:

management of the spectrum

unified licensing framework launched in 2008, no distinction between wired or wireless infrastructure operators.

- A commercial national wireless network is considered an infrastructure based operator and requires a Network Facilities Providers (NFP) license
 - The operator also applies for spectrum assignment (charged separately from the license fee)
 - The license fee would comprise an *upfront fee* and *annual operating license fee*
 - The operator also needs to be registered locally with at least 20% local equity ownership at the time of application or within 3 years after commencement of operation
-

Management of unlicensed spectrum

- 2.4GHz and 5GHz
 - CCK is working on a strategy of acquiring and releasing spectrum in 2.3 to 2.7GHz as well as 400 and 800MHz that is currently assigned to government agencies
 - procedures for operating in these spectrum include
 - registration with the regulator
 - compliance with technical limitations on power output, tolerance, modulation and range
 - Acquisition of a license if operating in the spectrum for commercial purposes
-

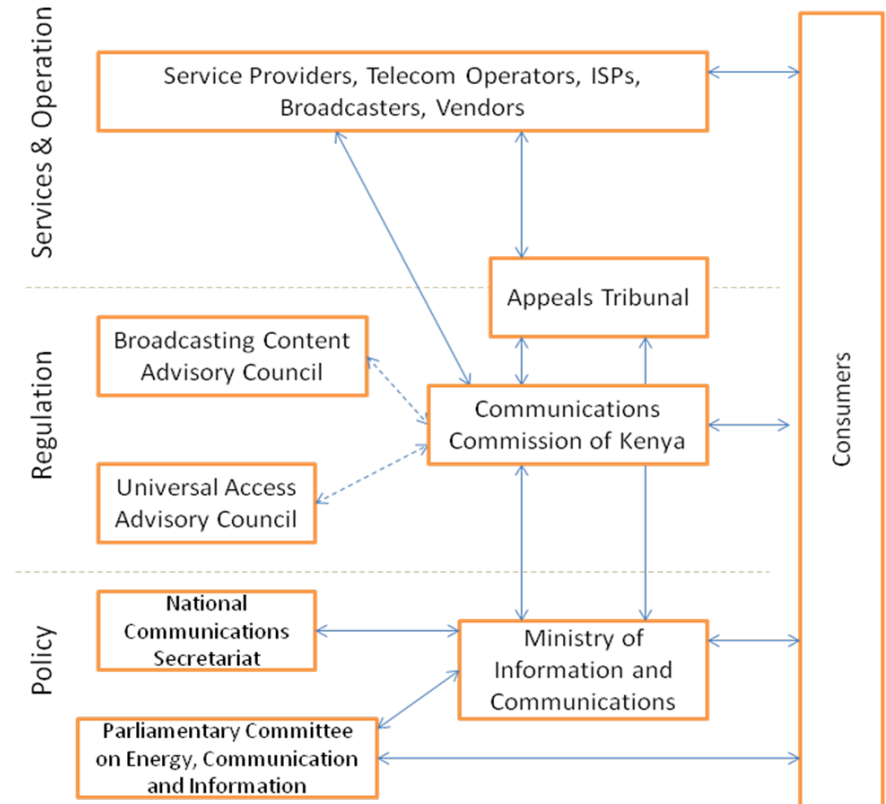
Re-use of government spectrum

CCK has reviewed and is working on plans to release spectrum in 2.3 – 2.7GHz as well as the 400 and 800MHz bands that are currently allocated to government agencies

- the plan is that the agencies will be allocated new frequencies and that the CCK will compensate for migration
 - CCK expects to recoup the cost of these acquisition of equipment from the allocation of the 'recovered' spectrum to the private sector
-

Decision making and transparency

- The balance of **power**, reporting lines, and **transparency** exhibited by institutions vary
 - With significant implications for independence and accountability
- Key actors
 1. Relevant government ministry performing some policy development role Ministry , NCS
 2. Regulator – CCK with overall mandate on spectrum
 3. Committee of predominantly/ exclusively government interest performing policy development and assessing use of spectrum – CLC within the regulator



Spectrum pricing

- Annual license fees are set out in a schedule that specifies the license fee for any type of the radio transmitting station
 - Typical licence fees for fixed wireless access on licensed spectrum comprises of:
 1. an exclusive spectrum bandwidth assignment fee
 2. a spectrum usage fee
 - With shared and non-protected wireless access systems, spectrum fee of ksh 10,000 is applicable for each transmitter
 - **However**, operators in rural areas and sparsely populated regions pay the same fee as those in heavily populated areas
 - CCK considering introducing a ‘zoning’ mechanism into its computation of spectrum fees
 - Taking into consideration factors such as population size of the area and “ability to pay” in setting spectrum fees
-

Spectrum as a 'revenue generator'

- potential revenue that can be had from spectrum is a significant factor in governments' decisions when balancing the market value vis-à-vis the public/'commons' value of spectrum
 - Market-based approaches (e.g. auctions) are also thought to effective incentives for effective usage of assigned spectrum
 - revenue-generating and incentive-based arguments need to be addressed in promoting 'open spectrum'
-

Institutions for advocacy

- Institutions for advocacy on spectrum issues found to be absent
 - Research sought to identify:
 - (i) wireless access providers' association or any other association that seeks to promote the interests of providers of wireless access and other services
 - (ii) informal networks of wireless access providers that are talking about spectrum regulation, or in the process of forming an association
-

Policy implications

- *Spectrum access and management is a high priority issue*
 - elaborately defined in the policy framework, enacted in the enabling legislation and further refined in telecommunications regulations and a host of procedures
 - *Allows for predictability and flexibility*
 - The approach to licensing of spectrum is administrative method 'command & control'
 - an internal committee responsible for allocation of the spectrum.
 - *Pricing discovery is a not transparent*
 - policy however foresee a need to realise a market value and options of market based access are open for consideration.
 - CCK acknowledges market based approach as the way forward to ensure optimum usage, realise market value and incentivise efficient usage.
 - CCK has done an excellent job to operate transparently in spectrum management.
 - *Unfortunately, some key component of the process – the consideration of the committee assigning the frequency is not open to public scrutiny*
-

Policy implications

- Pricing method is administratively determined with formulas for each application.
 - The challenge however is that with same pricing countrywide, those in the rural areas with less population density and less purchasing power are penalised.
 - *Spectrum is inadequate* . To release additional spectrum CCK is undertaking the following initiatives
 - digital TV migration,
 - periodic spectrum utilisation audits,
 - nudge government to release excess spectrum etc,
 - *however a radical approach is needed to address long-term needs for spectrum. A combination of market based and commons approach are necessary to incentivise efficient usage.*
 - *government still occupies very critical parts of the spectrum that private sector crave for to provide broadband wireless access.*
 - Offers to pay-off the government to migrate to other parts of the spectrum have been proposed and it is for the government agencies to make the move
 - *While spectrum is a key infrastructure for growth of telecommunications, it has not attracted public attention*
 - access and use is an operator /regulator issue outside the public domain. There are no lobby groups/ forums addressing spectrum issues
-