THE REPUBLIC OF UGANDA

MINISTRY OF INFORMATION AND COMMUNICATIONS TECHNOLOGY & NATIONAL GUIDANCE (ICT & NG)

NATIONAL SPECTRUM POLICY FOR UGANDA

(DRAFT)

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FOREWORD

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ABBREVIATIONS

AGR	Adjusted Gross Revenue
DX	Discontinuous Transmission
GHz	Gigahertz
GSM	Global System for Mobile Communication
ICT	Information Communications Technology
ITU	International Telecommunications Union
KES	Kenyan Shillings
KHz	Kilohertz
LTE	Long Term Evolution
MHz	Megahertz
MoF	Ministry of Finance
MoICT@NG	Ministry of Information, Communications Technology and National Guidance
M&A	Mergers and Acquisitions
NDP	National Development Plan
NFAC	National Frequency Assignment Chart
RCDF	Rural Communications development fund
SDGs	Sustainable Development Goals
SFHC	Synthesizes Frequency Hopping
SIP	Sector Investment Plan
SUC	Spectrum Usage Charge
UCC	Uganda Communications Commission
UGX	Ugandan Shillings
UPTC	Uganda Posts and Telecommunications Corporation
US	United States
USD	United States Dollars

EXECUTIVE SUMMARY

1. Spectrum has been internationally accepted as a scarce, finite and renewable natural resource which if not efficiently managed will not yield maximum socio-economic benefits. It has a high economic value in the light of the demand for it on account of the tremendous growth in the ICT sector. Although it does not belong to a particular State, right of use has been granted to States as per international norms.
2. There are several variables one must consider when managing the spectrum resource, these are Political issues, both national and international; the effect of spectrum uses on society; economic impacts; and technical considerations.
3. Technological neutrality and flexible spectrum use should also be used to stimulate competition among different technologies and also facilitate new competitors. In management of spectrum, International harmonization is important by aligning domestic spectrum policies with internationally recommended practices.
4. The deployment of ICT networks and applications are considered as key elements, which requires significant investments, to integrate and enhance coherent economic development. This requires a proper regulatory framework and policy to be in place. An enabling policy & regulatory environment; infrastructure; and ICT applications and services forms the three pillars of information society.
5. The National Spectrum policy has been developed to guide the management of Spectrum in Uganda. The guiding principles for Policy include: Promotion of policy synergies between the National Spectrum Policy and other relevant Policies, national goals and objectives; use of national standards in conformity with the ITU standards; technology Neutrality of the radio spectrum; transparency in handling spectrum management; efficient utilisation of spectrum; realising the true value of the spectrum; support for regional participation by provision of preferential treatment to regional operators; promotion of environmental protection for sustainable socio-economic development;

and contribution to regional and international initiatives.

6. With the thrust in ICT policy by the Government, there is a need to assess the demand for spectrum for the next five years. Since, the SIP targets to achieve 90% tele-density, Broadband access speeds of 30Mbps per household in urban areas; 100% broadband penetration in urban and atleast 50% in rural areas.
7. The first and foremost concern is to bridge the digital divide. The gap between the rural tele-density and urban tele-density is wide. Apart from meeting the communication needs of the people, telecommunications can benefit rural businesses by giving them direct access to customers and linking them to various markets, suppliers, technology, and government incentives.
8. There is need to follow a different approach for rural areas. For example, small players could be in a better position to serve the rural market. But current licencing do not allow small players to serve rural markets separately. One approach will be the possibility to introduce district level licences so that small operators could serve the ICT local needs. The rollout obligations of the various service providers also needs revision. This should enable to provide substantial incentives to service providers for spreading their network in rural areas.

Broadband Infrastructure

9. The second area of concern is the low penetration of Broadband which is necessary to enable businesses and in turn will impact human life. Uganda today stands at the threshold of great opportunities. A growing economy, a young and increasingly literate population and wide technological base gives it the opportunity of emerging as a power in the African region. There is no doubt that ICT is recognised to play a significant role in bridging the divide between the rich and the poor. In Uganda, the penetration of Internet and broadband has remained low. Broadband penetration is just 19% while the telephone penetration is 55%.
10. Broadband is going to play a significant role in transformation of

telecommunications due to technological innovations, new service offerings, convergence, introduction of smart devices, and change in customers usage habits. A robust broadband network along with applications meeting the needs of the citizens would truly help in realising the objective of inclusive growth.

11. All these developments will result in significantly higher requirements of spectrum. It is estimated that the total requirement of spectrum in the next five years will increase significantly, atleast by 50%. The spectrum that is currently available with the operators is 445.265 MHz. The future requirements of spectrum should be calculated so as to ensure effective spectrum utilisation.

12. Furthermore, it is required that a complete spectrum audit[1] exercise is required to be carried out on all the service providers to see the efficient utilisation of spectrum by the service providers. Achieving optimal levels of spectral efficiency is the hallmark of any credible spectrum policy. It is essential that the utilisation of spectrum by the service provider is monitored on a regular basis by the regulator.

13. Since 2008 no major review of the license fee, spectral usage charges and other fees had taken place, though the value of UGX shillings fell by more than 50% in relation to US$. (In 2008 the UGX was 1710 to a $ when compared to 3605 currently) Also the spectral fees paid do not reflect the true economic value of the spectrum. This has resulted in notional loss to the Government. The true value of the spectrum and its use are required to be identified and accordingly imposed on the service providers. For, the excess holding of spectrum above 5MHz by the service providers the relevant costs and the additional Spectrum Usage

[1] A number of technological developments are taking place in the sector for efficient utilization of available spectrum. There are different efficient techniques like Synthesises Frequency Hopping (SFH), Tighter Frequency Reuse plan (Cell splitting/electrical down tilt antennae), Discontinuous Transmission(DX), Power control, In-building solution & Micro cells, AMR codec etc, to utilize the available spectrum more efficiently. It is expected that the service providers use these latest techniques so that they are able to support more traffic per MHz of spectrum, serve more number of customers and remain competitive in the market.

Charge (SUC) needs to be collected after cost correction or the relevant roll out obligations be implemented.

14. The rollout obligations for the licences needs to be clearly defined by the regulator and not left to the service providers. The obligations should amongst others ensure coverage across the country. It should be defined taking into consideration of geographical area covered, population covered and the per capita GDP of the area. The regulator should evolve these obligations after stakeholders consultation. Proper provision for existing licensees, who have already completed more than four years may be incorporated to complete the roll out in the required number of habitations. Failure on the part of a service provider to fulfil the proposed roll out obligations should entail penalty in the form of additional spectrum usage charges.

15. The current provision is that the National telecom operator licence is valid for 20 years from the date of issue and can be renewed. A clear renewal policy framework should be established. Spectrum should not be bundled with the licence and must be applied for separately.

16. Some service providers, hold spectrum in the 900 MHz band. Currently, different countries have commenced refarming of the 900 MHz spectrum in view of its value for providing 3G/4G services and for future technologies. Accordingly, during renewal of the licence, spectrum held by a licensee in the 900 MHz band shall be replaced by assignment of equal amount of spectrum in other bands at the determined price or the true value of the 900 Mhz should be paid by the service provider.

17. In so far as licences are concerned, has been done currently, licence should not be bundled with spectrum. However the regulator could undertake a study, if required, to bring out suitable licensing framework. The licences to be issued can be :-

(a) a unified licence, covering various access services, services between districts, international long distance carrier, Internet, Infrastructure providers. It can either be a national level licence or metro level licence or district area-wise licence. The entry fee would have to be suitably

notified by the regulator.

(b) class licence covering V-Sat services;

(c) licensing through authorisation for various application services; and

(d) broadcasting licences.

The unified license will help reduce the cost of delivering services to the consumer.

18. In so far as the criteria for assignment of spectrum is concerned, the choice could be either subscriber linked criteria, auction method, low tariff offerings, mandate covering all rural areas or any other criteria depending on bands and coverage. The criteria so chosen should transparently be proportional to the true value of the spectrum. Hence, the assignment of spectrum should be linked with the fulfilment of roll out obligations and tariff offerings.

19. The SUC paid by service providers should be differential. Service providers holding large quantum of spectrum should pay a higher percentage of SUC, when compared to those with lesser spectrum.

20. Considering the number of service providers in the country, and the position relating to availability of spectrum, measures for consolidation of spectrum should be facilitated. These measures should include mergers & acquisitions (M&A) and spectrum sharing. The M&A guidelines should ensure no monopolistic environment develops in the sector. Though the regulator, can frame the relevant guidelines, it needs to be ensured that the market share of any entity should not exceed 50% of the total subscriber base and/or the AGR after merger or spectrum sharing. Also, consequent upon merger of licences, the guidelines should ensure that the total spectrum held by any entity shall not exceed a value that will create a monopolistic environment. Excess spectrum if any beyond these limits shall be returned to the regulator.

21. For the present, Leasing and trading of spectrum should not to be permitted. In countries where spectrum trading is permitted, the spectrum is normally assigned through a market mechanism, i.e. auction. Secondly, it is possible that allowing spectrum trading at this

juncture might result in anti-competitive conduct through consolidation/hoarding of spectrum or through an incumbent precluding the newcomers from providing service by buying out the spectrum necessary for such services. Thirdly, spectrum has only been assigned on a "right to use" basis for a fixed period to the service provider. A licensee has no ownership right to enable it to 'trade' in it. For these reasons, spectrum trading and leasing should not be currently allowed.

22. The policy also helps in strengthening the revenue collection system of the regulator. Proper steps need to be taken to harmonize spectral monitoring and management practices. All information on spectrum – the efficiency; spectral holdings; quality of service offered; number of subscribers served; traffic carried; should be transparently put up in portal developed for this purpose and ensure that such portal is commissioned within the first three months.

23. The contents of the policy are structured in a number of chapters as shown below:

Chapter One is an Introduction. It states the current spectrum management environment while highlighting the importance of radio spectrum to socio-economic development of Uganda.

Chapter Two states the Vision, Mission and guiding principles of the Policy. It also mentions the broad policy objectives and proposes strategies to be used in achieving the broad objectives.

Chapter Three is the implementation framework. It states and defines the roles, responsibilities and functions of various stakeholders both public and private in implementation of this policy. It also covers the current Legal Framework covering spectrum management in Uganda.

24. The Ministry of Information and Communications Technology & National Guidance (MoICT & NG) shall monitor and evaluate the Policy together with other relevant stakeholders as mentioned in the implementation framework of the Policy.

CHAPTER 1: INTRODUCTION

1.0 BACKGROUND

Radio spectrum is the portion of electromagnetic spectrum that carries radio waves. The total supply of spectrum though theoretically infinite, the extent to which it can be utilized is limited by the available technology. Generally, the available frequency for radio communication is considered in the range from 3 KHz to 300 GHz.

The rising importance of the radio spectrum in the world means that the way in which it is managed is vital for the economical and societal development of the country. Presently, in Uganda, radio communications cover the following:

a) Wireless telecommunications services;
b) Broadcasting services (radio and television);
c) Defence forces, police, emergency services and other public safety and security providers;
d) Short-range communications systems and low-power short- range technology, radio sensing, locking and control devices; and
e) Aeronautical, maritime, land and satellite-based communication, meteorology and other science services.

Originally, Section 3(1) of the Uganda Posts and Telecommunications Act vested management of radio communications in the then Uganda Posts and Telecommunications Corporation (UPTC). However after the enactment of the Uganda Communications Act in 1997, the management of the spectrum were inherited by the Uganda Communications Commission as per section 5(c) of the Act. The current Uganda Communications Act of 2013 under section 5 (c) has also vested management of Spectrum to Uganda Communications Commission.

1.1 CURRENT SPECTRUM MANAGEMENT FRAMEWORK IN UGANDA

The spectrum in Uganda is managed by the regulator, Uganda Communications Commission (UCC). In 2009, UCC issued Radio spectrum policy guidelines to guide the public on the use of the resource in a proper

manner. These guidelines outlined the objective and the spectrum management principles, that form the key basis for the management of the spectrum in the country. These guidelines also form a basis for radio frequency licensing policies, requirements and procedures in the management of the radio spectrum resource that includes frequency allocation, planning and monitoring its use. But the current spectrum management do not address certain critical issues like:-

- Spectrum is not allocated to the highest value users or uses thus ensuring maximum benefits to society;
- Currently there is no mechanisms to enable and encourage spectrum to move to its highest value use;
- There is no balance between the risk and cost of interference against the benefits gained from greater spectrum utilization;
- No extensive and transparent stakeholder input and consultations, including the Ministry or the public through notifications seeking written input on issues of spectrum management policies that govern spectrum use, assignment, licensing, spectrum pricing and refarming. This has resulted in not having a well-balanced national spectrum plan and regulations accommodating the needs of the public and private sectors, for the benefit of the society;
- No optimized value of the scarce radio spectrum resources and thus ensuring efficient use through the utilization of market-based mechanisms;
- The current plans of managing and monitoring the utilization of radio spectrum resources, requires review and needs to be improved;
- The need to recognize that Radio frequency spectrum is a strategic national public resource by the Government of the Republic of Uganda;
- Currently there is no systematic review process on spectrum say once in 2 or 3 years that involves consultation with the public and other interested parties for the purposes of preparing a roadmap.
- No rules, procedures and standards exist currently to promote equitable sharing of spectrum amongst services and all users.

- The current spectrum management processes for frequency assignments does not take into account market-based mechanisms, flexibility of use, liberalised licence conditions including spectrum trading, and licence exempt spectrum use.

1.2 THE NEED FOR THE NATIONAL SPECTRUM POLICY

Radio spectrum being a scarce and non-reproducible natural resource, spectrum management policies play a vital role in ensuring the efficient use of spectrum for the maximum good. A natural resource's value rests in the amount of the material available and the demand for it. The latter is determined by its usefulness to production. Natural resources belong to the people but the State legally owns them on behalf of its people and from that point of view natural resources are considered as national assets, more so because the State benefits immensely from their value. The State is empowered to distribute natural resources. However, as they constitute public property/national asset, while distributing natural resources, the State is bound to act in consonance with the principles of equality and public trust and ensure that no action is taken which may be detrimental to public interest.

The ownership regime relating to natural resources can also be ascertained from international conventions and customary international law, common law and national constitutions. In international law, it rests upon the concept of sovereignty and seeks to respect the principle of permanent sovereignty (of peoples and nations) over (their) natural resources as asserted in the 17th Session of the United Nations General Assembly

As natural resources are public goods, the doctrine of equality, which emerges from the concepts of justice and fairness, must guide the State in determining the actual mechanism for distribution of natural resources. In this regard, the doctrine of equality has two aspects: first, it regulates the rights and obligations of the State vis-à-vis its people and demands that the people be granted equitable access to natural resources and/or its products and that they are adequately compensated for the transfer of the resource to the private domain; and second, it regulates the rights and obligations of the State vis-à-

vis private parties seeking to acquire/use the resource and demands that the procedure adopted for distribution is just, non-arbitrary and transparent and that it does not discriminate between similarly placed private parties.

Spectrum is finite and limited by geographical range. Owing to its limited availability, the need for its efficient allocation is appreciated. Pricing of spectrum is important to avert any "tragedy of the commons" problem. The consumption of spectrum is both rivalrous and excludable. Though it has the potential to be reused and reallocated, its consumption or use by one service provider entails a smaller amount of spectrum available for another to employ as it is scarce; hence, it is rival. To ensure interference-free operations by service providers, spectrum has perforce to be excludable. Several restrictions prevail on the supply side due to its attributes of overall scarcity and rivalry and excludability in consumption. Hence an efficient and transparent spectrum management methodology is required to be in place.

In some of the African countries, the realisation of the value of the spectrum in certain bands have helped the exchequer to fund a number of developmental projects especially in non-viable areas. The table 1 below provides a snap shot of the value of spectrum realised for some of the bands in some African countries.

Table 1. Spectral value realised

S.No	Country	Spectrum Sold	Amount	Population (millions)	$/MHz/pop	GDP per capita (PPP$)
1	Nigeria	30 Mhz of 2.3GHz & 80 Mhz in 2.6GHz	119 million USD	164	0.006	2,697
2	Ghana	20 MHz of 800 MHz	67.5 million USD	29	0.116	1,513
3	Kenya	60 MHz of 800 MHz	75 million USD	42	0.029	1,781
4	Senegal	20 MHz of 800 MHz & 20 MHz of 1800 MHz	53 million USD	13	0.101	2,005
5	Egypt	40 MHz of 900/1800 MHz	1.9 billion USD	96	4.947	3,514
6	Rwanda	10 MHz of 800 MHz	PPP to cover 95 per cent of the population with LTE Network within three years.	12		704

In Rwanda, interestingly, through a PPP model, 95% of the population will be covered with LTE network within three years, increasing the broadband penetration in the country.

Apart from the realisation of the spectral prices, the operators have to pay the annual spectral fees for using the spectrum. The table 2 below is a sample of the annual spectral fees per MHz, in GSM 900 band collected by some of the African countries.

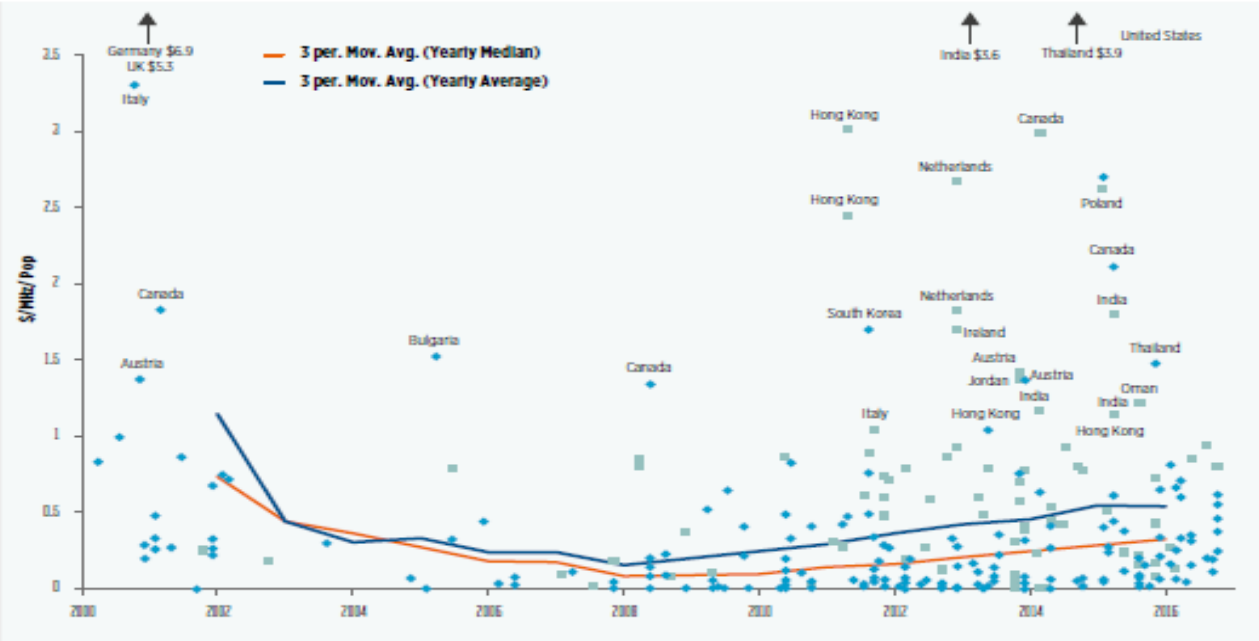
Table 2. Annual Spectral fees

S.No	Country	Annual Spectral fees per MHz (USD)
1	Nigeria	124000
2	Ghana	166666
3	Kenya	60559
4	Rwanda	3559
5	Malawi	13875
6	Uganda	13939

The total spectral fees collected from only mobile network operators in Kenya was around 4 billion KES (38 million USD) while it is around 14 million USD in Uganda (non-adjusted).

The figure 1.1 below provides details about the plot of a moving average of prices for mobile spectrum over the 2000-2016 period, globally. It may be noted that worldwide, since 2008, there has been an upward trend in prices, coinciding with the take-off of 4G services.

FIGURE: 1.1 GLOBAL TRENDS IN SPECTRUM PRICES, BY BAND AND AUCTION (2000-2016)



Notes: Green = Prices for coverage bands below 1 GHz) (700 MHz, 800 MHz, 850 MHz and 900 MHz); Blue = Prices for capacity bands above 1 GHz (PCS, AWS, 1800 MHz, 2.1 GHz and 2.6 GHz).

Prices per MHz pop are adjusted for inflation and were converted to USD using IMF purchasing power parity (PPP) rates. Prices are also adjusted for licence duration, based on a standard 15 years, using a 5% discount rate.

Source: NERA Economic Consulting Global Spectrum Auction Database.

The importance of spectrum management and policy thus dictates the State, control over this resource which must be guided by Policy. There is thus a need, therefore, for involvement of Government and comprehensive consultation must be made with all stakeholders for its efficient and effective management. There is also need to address emerging issues brought about by change in technology and change in the wireless communications market which has led to a tremendous increase in the demand for spectrum. Also, spectrum is required to be conserved for future technologies.

The nation needs to evaluate the level of regulation that it believes is necessary to accomplish its national goals, while providing protection in accordance with international agreements. Spectrum management should therefore be guided by national policies, ensuring that its regulations conform to national objectives and do not conflict with international regulations. Hence it is essential that :

1. Spectrum is allocated efficiently and transparently maximizing the real value of the spectrum in an non-arbitrary manner.

2. Optimal use of spectrum using spectrum efficient technologies are encouraged.
3. Ensure efficient and effective spectrum monitoring and spectrum management practices.
4. Realise the true value of the spectrum.
5. Allocation of adequate spectrum to cater for Government's spectrum requirements for security, emergency, aeronautical and maritime travel/science services.
6. De-license certain frequency bands for public use, research and operation of low power devices and make it part of the NFAC ;
7. Allocation of adequate spectrum to cater to the requirements of national radio services.
8. To make available adequate globally harmonised spectrum in 450 MHz, 700 MHz, 1800 MHz, 1910 MHz, 2.1 GHz, 2.3 GHz, 2.5 GHz, 3.5 GHz bands and other bands to be identified by ITU for commercial mobile services.
9. To consider requirement of spectrum in certain frequency bands in small chunks at specified locations for encouraging indigenous development of technologies/ products and their deployment.
10. Identify the digital dividend band so that it is used to extend broadband services and digital television services including mobile TV across the country.
11. To refarm spectrum and allot alternative frequency bands to service providers from time to time and to make spectrum available for various new applications.

The requirement of spectrum is required to be assessed periodically. For assessing the requirement of spectrum for the next five years, it is first necessary to estimate the number of subscribers of telecom services by 2021. The SIP plans projects that the tele density should increase from 50% to 90% by 2021. Hence the estimated wireless subscriber base figures by March 2021 will be over 42 million subscribers. Regarding the number of data subscribers by 2021 and more importantly, the amount of spectrum which will be required to cater to their requirement, it is seen that presently, the number of

subscribers, who have subscribed to data services is about 16 million. It is expected that the introduction of 3G and LTE technologies in the country will give an impetus to the growth of various applications and development of customised value added services and the number of the subscribers using data services will increase at a much faster pace in the next five years. Therefore, it is likely that there will be atleast 22 Million users for the data services by 2021.

It is also true that a major part of this traffic may emanate from 3G/LTE services. It has to be noted that data traffic emanates mainly from video traffic and social networking sites. However, the traffic is likely to come also for the following main applications:

a. Agriculture and extension services.
b. Healthcare through telemedicine.
c. m-governance.
d. m-education.
e. surveillance and safety devices employed by individuals as well as agencies such as police, and corporate entities.
f. Other sectors such as mobile banking, m-commerce, tourism, mobile-entertainment, voice-web, gaming etc., will also push the data traffic.

Also after an allocation of about 100 MHz in the 585-698 MHz band for the Broadcasting services including mobile TV, another 100 MHz in the 698-806 MHz band exists for future broadband services requirement.

The summary of total spectrum allocation versus its availability is given in the table 3 below:

Table 3: Spectrum allocation Table

No	Band	Uplink Range (MHz)	Mode of operation	Amount of Spectrum (MHz)	Amount of Spectrum Assigned (MHz)	Percentage Utilization.
1.	450 MHz	Uplink: 450-456.36 Downlink: 460-466.35	FDD	6.325	2.525	40%

2.	800 MHz	Uplink: 832-862 Downlink: 791-806	FDD	30	30	100%
		Uplink:832.86-832.89 Downlink:872.94-877.89	FDD	6.3	5.04	80%
3.	E-GSM 900 MHz	Uplink: 880-890 Downlink: 925-935	FDD	10	10	100%
4.	900 MHz	Uplink: 890.2- 914.8 Downlink: 935.2-959.8	FDD	24.2	24.2	100%
5.	1.7GHz	1787-1802	TDD	15	15	100%
6.	1800	Uplink: 1710.2-1785 Downlink: 1805.2-1880	FDD	75	75	100%
7.	2100 MHz	Uplink: 1920-1980 Downlink: 2110-2170	FDD	60	60	100%
8.	2.3 GHz	2300-2400	TDD	90	40	44%
9.	2.5 GHz	Uplink: 2500-2570 Downlink: 2620-2690	FDD	70	60	86%
		2570-2620	TDD	50	30	60%
10.	3.3 GHz	3300-3400	TDD	100	30	30%
11.	3.5 GHz	Uplink: 3401-3477 Downlink: 3501-3577	FDD	74	42	57%
		3477.5-3599	TDD	43	21.5	50%

With the implementation of new technologies, high bandwidth applications and increasing users' requirement to have ubiquitous mobile network, significant amount of additional licensed spectrum will be required in future to fulfil the consumers' needs. A clear roadmap would enable the planning process to meet these requirements and to draw up suitable policies to manage the same. Also today large tracts of the country still do not have internet connectivity.

The regulator has also undertook a detailed study on the spectral policy, which also highlights the core principles for spectral management to include the following:

- Spectrum should be allocated to the highest value uses or uses to ensure maximum benefits to society are realized; (To optimize the value of scarce radio spectrum resources and ensure their efficient use through the utilization of market-based mechanisms including international tenders)
- Mechanisms should be put in place to enable and encourage spectrum to move to its highest value use;
- Greater access to spectrum will be facilitated when the least cost and least restrictive approach is chosen in achieving spectrum management goals and objectives;
- To the extent possible, regulators and spectrum managers need to promote both certainty and flexibility;
- The risk and cost of interference must be balanced against the benefits gained from greater spectrum utilization; and
- Harmonized spectrum use with international and regional allocations and standards will generate additional benefits in terms of access and economies of scale and should be pursued, except where Uganda's interests warrant a different determination.

1.2.1 Sector Strategic investment plan

The MoICT & NG has also had its Sector Strategic and Investment Plan 2015/16-2019/20 approved by Cabinet. Key among the action areas and strategic interventions under ICT Governance is the review of Spectrum Management Framework to facilitate realisation of the broadband goals.

1.2.2 National ICT Policy

The National ICT policy, 2014 under its priority area of Policy and regulatory frameworks also caters for activities such as addressing emerging regulatory

challenges to the diffusion of broadband networks covering aspects such as effective spectrum management amongst others.

1.2.3 National Development Plan (NDP II)

In second National development Plan (NDP II) 2015/16-2019/20 under the objective "Improve the legal and regulatory frameworks to respond to the industry needs", one of the action areas is to review and develop appropriate policies, strategies and regulations to keep the sector abreast with technology developments and market forces/industry demands.

1.2.4 National Broadband Strategy

MoICT & NG spearheaded the development of the National Broadband Strategy. The vision for Uganda's Broadband Strategy is a transformed middle income economy driven by affordable high quality broadband connectivity. The overall objective of the strategy is to facilitate uptake of broadband for socio-economic transformation of the country. Under the objective of "Provide a harmonized and enabling environment for infrastructure development and utilization", one of the strategic actions is to formulate an ICT scarce resources management policy for their optimal utilization. (Spectrum being a scarce resource)

1.2.5 Sustainable Development Goals (SDG)

All the 17 SDGs are connected to the various focus areas viz sustainable development, Democratic governance & peace building and climate & disaster resilience. Clearly a robust National spectrum management and licensing policy will go a long way to enable the Country realise equitable development. It is against this background that the Ministry has developed the National Spectrum Policy. The Policy will amongst others address the issues of transparent allotment of spectrum and realisation of its true value; Spectrum monitoring and management; and effective utilisation of the spectrum-transparently, economically & rationally.

CHAPTER 2: THE POLICY

2.0 Introduction

The mission, vision and guiding principles of the National Spectrum Policy are laid in this chapter. The chapter also lays out the Policy objectives, Strategies and specific policy action areas.

2.1 Policy Vision

The Vision of the Policy is

"A Digitally Empowered and informed society through Efficient Use of Radio Spectrum"

2.2 Policy Mission

The Mission of the Policy is

"To ensure that spectrum is utilized efficiently, economically, rationally and optimally and allocated transparently "

2.3 Guiding Principles

To enhance the socio-economic growth and transformation, National Spectrum Management and licensing Policy shall be guided by the following principles:

a) Promotion of policy synergies between the National Spectrum Policy and other relevant Policies, national goals and objectives;
b) Use of national standards in conformity with the ITU standards;
c) Technology Neutrality in management of radio spectrum;
d) Transparency in allocation and assignment of spectrum and its management;
e) Realising the true value of spectrum;
f) Promotion of environmental protection for sustainable socio-economic development;
g) Ensuring efficient and effective spectrum monitoring and spectrum management practices; and

h) Alignment with regional and international initiatives to promote efficient and effective management of spectrum at national, regional and international levels.

2.4 Policy Objectives

The objectives of this Policy are to:

a) Promote efficient, economic, rational and optimal use of spectrum;
b) Establish a transparent process for allocation of spectrum;
c) Realise the true value of spectrum; and
d) Harmonize Spectrum Monitoring & Management practices.

2.5 Policy Strategies

Policy objective 1: Promote efficient, economic, rational and optimal use of spectrum.

Strategies:

a) Ensure that spectrum allocated should be technology neutral and efficiently utilised;
b) National Frequency Assignment chart (NFAC) to be reviewed periodically or as and when need arises, but not later than FIVE years and should be in line with the radio regulations of the International Telecommunication Union (ITU) and the changing environment;
c) Calculate the future spectrum requirements and ensure availability of the spectrum for growth of the ICT sector;
d) Promote use of white spaces without causing harmful interference to licensed applications;
e) Permit M&A, spectrum pooling and sharing for optimal utilisation of spectrum;
f) Ensure that all proceeds from monetisation of the spectral proceeds through auction, is transferred to the Rural communications Development Fund (RCDF). Also 5% of the annual spectral usage charges and other spectral charges be transferred to this fund;
g) Create regional service areas;
h) Establish roll out obligations for all service areas and services;

i) Spectrum in any band beyond 5 MHz to any service provider should be allotted only on the 'Value of Spectrum[2]'. All current service providers having spectrum beyond 5 MHz should also pay the additional 'spectrum price', pro-rated for the period of the remaining validity of their licence.

Policy objective 2: Establish a transparent process for allocation of spectrum

Strategies:

a) Ensure allotment of spectrum is made through a transparent, fair and equitable, avoiding monopolistic situation;

b) Establish Interactive communication channels between the Government, Regulator, service providers, Government users and the general public to disseminate information related to policies, rules and other spectrum management practices;

c) Spectrum in bands other than 450 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz and 2.5 GHz could be considered for non-commercial use on a case by case basis, after detailed consultative process;

d) The spectrum usage charges to be reviewed every 2 years.

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[2] The value of the spectrum is determined through various alternative techniques. One is a market-based approach, a valuation technique where the value of an asset is calculated based on the prices of actual transactions for similar assets. Another approach to the valuation of will be the indexation of the price (entry fee) paid by service providers to the telecom sector in initial year for acquiring licences and spectrum. The other alternative will be to fix valuation based on the over-all revenue expectations from the sale. Another approach will be based on technical efficiency. An alternate approach would be to derive relative valuations for different spectrum bands based on cost trade-offs when operations are switched from a technically more efficient band to a technically less efficient band. Yet another approach will be based on economic efficiency. Spectrum can also be valued on the basis of the producer surplus that arises when additional spectrum is allotted to an existing TSP. No one model completely captures every variable- technical, economic, sectoral, geographic and regulatory- that influences the valuation of spectrum. The best that can be done is to approach the matter from several different angles to arrive at a probabilistic "average" or overall basic valuation.

Policy objective 3: Realise the true value of spectrum

Strategies:

a) Evaluate various spectrum pricing methods and adopt appropriate methodology for pricing and allotment of bands transparently to ensure that the objectives of the policies are met. Different methods for different bands to be used;
b) Ensure that the allotment of spectrum is based on auction; tariff related; or roll out obligations related or any other criteria, transparently equating the true value of the spectrum allotted;
c) Formulate a Spectrum Advisory Committee with members from MoICT & NG; the regulator; academics and private sector (amongst non-interested parties), to discuss and advice on all spectrum related matters including spectrum pricing methodology for each band and mode of allotment.

Policy objective 4: Harmonize Spectrum Monitoring & Management practices

Strategies:

a) Conduct periodic audit of spectrum utilised by the service providers to ensure its efficient use. The details of the audit procedure and frequency of the exercise to be finalised and transparently published in the portal; Also establish unmanned remote monitoring units and routinely carry out such auditing across the country.
b) Setup a portal, within three months, that monitors in near real time the quality of service offered, the spectral efficiency, the traffic carried and the number of subscribers served. The portal should also transparently publish all spectral related data like usage, efficiency etc periodically;
c) Periodic review of spectrum use;
d) Carry out a comprehensive review of the present usage of spectrum available with various agencies/ service providers;
e) Establish research capacity for undertaking policy research in radio spectrum engineering, management, radio monitoring and related aspects;

2.6 POLICY TARGETS

a) Create atleast four regional license service areas by 20xx.
b) Provide a framework for consolidation of spectrum by 20xx.
c) Maximize the value for the spectrum through a transparent process.
d) Establish an open platform to encourage various stakeholder's participation in spectrum related decision-making processes within three months.
e) Establish the Spectral advisory committee within three months.
f) Provide suitable frameworks for use of spectrum efficiently in the network by 20xx.
g) Provide for periodic on-line monitoring of the spectral usage, quality of service offered, traffic and number of subscribers served within three months.

CHAPTER 3: IMPLEMENTATION FRAMEWORK

3.0 Introduction

The successful achievement of the National Spectrum Policy will depend on an integrated approach during implementation supported by developing strategic synergies and partnerships. This implies that clear definition of the roles, responsibilities and functions of all the stakeholders must be made.

3.1 Institutional Framework

The following institutions are important in creating a favourable and enabling institutional framework that will drive the coordination and implementation of the Policy.

3.1.1 Ministry of Information and Communications Technology & National Guidance

The Ministry of ICT shall be responsible for the overall oversight and coordination of implementation of the Policy. Specifically, the Ministry shall:

a) Where necessary, coordinate the review, development and implementation of relevant laws relating to Spectrum Management and ensure that they are in tandem with regional and international best practices;
b) Provide guidance on good leadership and direction to the Regulator in execution of its mandate;
c) Undertake public awareness at all levels through expos, forums, conferences and other forms of stakeholder consultations.
d) Ensure that the policy is implemented within the time frame.
e) Ensure proper utilisation of the 'RCDF fund'.

3.1.2 Uganda Communications Commission

The Uganda Communications Commission (UCC) is an independent Regulator, first established under the Communications Act of 1997. It is mandated with the responsibility of promoting and regulating communications services in the country under the policy guidelines of the

Ministry. In implementation of this policy, UCC shall be responsible for the following:

a) Provision of an enabling regulatory framework for all stakeholders;
b) Create suitable Licensing spectrum users and ensuring the true value is achieved from allotment of the spectrum;
c) Ensure that the there is adequate information available to Government, operators and consumers on all matters relating to spectrum in Uganda transparently; and
d) Determination of the amount of spectrum available including digital dividend and their efficient use.
e) Provide suitable regulations for efficient use of spectrum – spectrum sharing, spectrum refarming, etc.
f) Ensure publication of the spectral chart periodically in the portal.
g) Monitor and evaluate the use of the allocated band periodically and publish the results transparently in the portal.
h) Act as convenor of the Spectral Advisory committee

3.1.3 Roles of the Spectrum Advisory Committee

The role of the Spectrum Advisory Committee comprising of members from MoICT & NG; the regulator; academics and private sector (amongst non-interested parties), will include among others:

a) Provide strategic advice to the regulator and where appropriate to the Minister on matters relating to spectrum, services and applications. The committee will also consider future telecommunications land scape from technological, economic and societal perspective in line with the national development agenda;
b) Evaluate and advice on the methodology for valuation of spectrum as proposed by the regulator and prescribe the value of the spectrum for different bands;
c) Advice on the criteria for spectrum allocation and the allotment methodology for different spectrum bands;
d) Advice on the regulator's spectrum strategy, Spectrum management and the application of spectrum pricing/trading principles.

e) Advice on new efficient means of managing spectrum and their implication for the regulator.
f) Interlocute with the regulator, to see whether the current and developing policy stance is appropriate and where appropriate new policy interventions are made.
g) Advice on other technological interventions - Cognitive radio's, digital dividend, emerging uses of spectrum in different sectors like transport, health etc, ways to measure and asses the effectiveness of spectrum management policies, balance between licensed and license–exempt spectrum, stimulation of innovation through spectrum policy etc.

3.1.4 Parliament

The role of Parliament in the effective implementation of this policy shall include among others:

a) Where necessary, enacting appropriate and effective legislations that will create a flexible, dynamic and responsive legal and regulatory environment to support the implementation of the Policy;
b) Facilitate the allocation and approval of financial resources for implementation of the Policy;
c) Monitor the effective utilization of financial resources allocated to public sector institutions for the implementation of the Policy; and
d) Ensuring that good governance principles are applied and adhered to in the implementation of the Policy by public sector institutions.

3.1.5 Cabinet

Cabinet is the highest policy making organ of the Government and is therefore responsible for determining, formulating and implementing the policy of Government. Cabinet collectively, and Ministers individually, have a primary duty to ensure that Government policy best serves the public interest.
In this regard, Government shall:

a) Provide visionary and catalysing leadership at the highest level of Government to Support the implementation of the Policy

b) Ensure development and implementation of sector-based Implementation/Action Plans to mainstream the provisions of the policy in National Development Plans and other strategic frameworks;
c) Mobilise resources especially for programmes targeted to implement this Policy.

3.1.6 Operators

Operators include both Government and private users of the spectrum. The users are generally expected to cooperate with the Regulator and the Ministry in all aspects during implementation of this policy.
Specifically, their envisaged roles are as follows:

a) Recognize on their books of account that Spectrum is a National and not private resource;
b) Participate and support Government in local, regional and international forums where matters related to spectrum are being discussed;
c) Take advantage of business opportunities resulting from the implementation of this policy including IoT and other low powered devices; and
d) Support development of human resources to be compliant with the new Policy and regulatory framework.

3.1.7 The people

Uganda is a country with a population with diverse incomes, education, races and cultures. The people of Uganda shall be responsible for the areas below during the implementation of the Policy:

a) Fair use of communications equipment especially in licence exempt frequency bands;
b) Purchase and use of communications equipment compliant with the National standards; and
c) Legal use of communications equipment in licensed bands.

3.2 Legal Framework

Before liberalization of the communication sector, the country had only one operator, Uganda Posts and Telecommunications Corporation (UPTC). Section 3(1) of the Uganda Posts and Telecommunications Act vested management of radio communications in UPTC. However after the enactment of the Uganda Communications Act in 1997, the management of the spectrum were inherited by the Uganda Communications Commission as per section 5(c) of the Act.

The current law, the Uganda Communications Act of 2013 under section 5 (c) has also vested management of Spectrum to Uganda Communications Commission under the overall policy guidelines of the Ministry.

3.3 Monitoring and evaluation

3.3.1 Introduction

This Policy has been designed to meet all its objectives in five years. As such, a monitoring and evaluation framework has been developed to guide in monitoring and evaluation of the Policy. The Policy shall be subjected to short term annual reviews and a long term review at the end of the five year period. The MoICT & NG shall monitor and evaluate the Policy together with other relevant stakeholders as mentioned in the implementation framework of the Policy. The Office of the Prime Minster shall also play its Constitutional role of monitoring and evaluation of the implementation of this Policy.

3.3.2 Methodology

The following three methodologies shall be used to monitor and evaluate implementation of the Policy.

3.3.2.1 Assessment of impact

Assessment at the impact level should be able to assess the extent to which the Policy has contributed to the social transformation of Ugandans. And also ensure that the policy targets are achieved.

3.3.2.2 Monitoring and assessment of outputs

The monitoring and evaluation framework will track and assess the effectiveness of the Policy by monitoring the progress towards achieving the desired objectives.

3.3.2.3 Monitoring and assessment of Implementation

The monitoring and evaluation framework will assess the efficiency of implementation of the Policy by checking the following:

i) Whether there are sufficient human, financial and institutional resources to implement the policy;

ii) Whether the implementation is according to plan; and

iii) Whether the overall objectives of the policy have been achieved.