East African Communications Organisation

Communications for all in East Africa

EACO INFRASTRUCTURE SHARING GUIDELINES

Prepared by EACO

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Contents

ACRONYMS

EAC	East African Community
GDP	Gross Domestic Product
ICT	Information and Communications Technologies
IFC	International Finance Corporation
MNO	Mobile Network Operators
NRA	National Regulatory Authorities
SDG	Sustainable Development Goals
TowerCos	Tower Companies
TOR	Terms of Reference

1. INTRODUCTION

The United Nations 2030 Agenda for Sustainable Development and the associated 17 Sustainable Development Goals (SDGs) underscore the positive relationship between access to Information and Communications Technologies (ICTs) and economic growth and prosperity. In particular, the SDGs recognize telecommunications infrastructure as a key-contributing factor to enabling global interconnection and facilitating access to a wide range of Internet-powered applications, including for communications, work, commerce, healthcare, and education etc….

In this light, accelerating access to ICTs requires governments in the East African Community (EAC) region to; (i) foster an enabling regulatory environment that attracts investments (both foreign and local) in telecommunications infrastructure; and (ii) encourage the development of new business models (e.g., infrastructure sharing) that reduce the costs associated with infrastructure development and deployment and ensures open access for all stakeholders.

EACO Working Group 2 on Infrastructure Development, Connectivity and Digital Inclusion was tasked in Terms of Reference (TOR), to among others:

- Develop guidelines and recommendations to facilitate infrastructure sharing in the region.

This Guidelines document provides information on existing infrastructure facilities in the EAC Region as well as the existing regulatory frameworks pertaining to infrastructure sharing across Member States.

The Guidelines further highlights the infrastructure connectivity gaps and challenges in the EAC region and provides actionable recommendations on how to address these gaps through encouraging infrastructure sharing, to the benefit of expanded connectivity and reduced costs.

2. EXISTING INFRASTRUCTURE FACILITIES

During the WG02 meeting held from 29th -31st January 2018 in Arusha, it was agreed on the need to review the existing communication Infrastructure facilities in all the EAC Partner states and make recommendations on how to address the identified infrastructure and connectivity gaps or challenges in the region.

Annex 2 shows the Existing Infrastructure of the EAC in terms of the legal and institutional environment, Optical fiber Infrastructure, Relevant Statistics on Infrastructure development and Connectivity.

3. INFRASTRUCTURE CONNECTIVITY GAPS AND CHALLENGES

The Covid-19 Pandemic has drastically changed every sphere of our lives, including business, education, healthcare, socializing, leisure, and travel. As governments have implemented a wide range of policy responses to manage the impact of the virus, a unifying theme from every country has been the importance of connectivity.
Despite global consensus on the positive relationship between mobile connectivity and development, in Sub-Saharan Africa one in four people are still not covered by any mobile signal, and half of those who are covered do not use the internet, according to the GSMA.[1]

The connectivity gap is further exacerbated by regulatory challenges associated with the operations of existing communications facilities in the EAC partner states, including:

I. Failure to Recognize the Role of Passive Infrastructure Providers (e.g., Towercos)

The foundation of mobile connectivity is the network of communications masts and towers, most of which are provided by independent Tower Companies (TowerCos). TowerCos lease space on their towers to multiple Mobile Network Operators (MNOs), who place their own network equipment on them to provide their services to consumers and business. This model of shared use reduces the overall investment and operating costs for MNOs, enabling them to deliver faster network rollout in more locations, improve coverage, reduce consumer prices, and raise service quality.

Nevertheless, regulatory approaches across the EAC region often fails to recognize the unique and vital role of passive infrastructure (providers) and the specific regulatory approached needed to protect and support installation.

II. Lack of Infrastructure Sharing Frameworks

Despite the well-known benefits of infrastructure sharing, regulatory guidance on the subject remains poor. For example, current regulatory frameworks are fragmented with little to no explanation of co-location, lack of clear identification of responsible government agencies, and lack of understanding of the various types of sharing models. This reduces national coordination, which leads to duplication of infrastructure where sharing is feasible. As shown in Annex 2, some EAC countries (e.g., Uganda and Kenya) are in the process of developing and updating infrastructure sharing guidelines/frameworks to bridge the regulatory gap.

III. Regulatory Uncertainty, Including Lack of Common Standards

The lack of clear guidelines for construction, aesthetic requirements for site deployment, acceptable Electro Magnetic Field Emissions (EMF) limits, and the lack of a regional

[1] GSMA (2020). "State of Mobile Internet Connectivity 2020."

common standard on permitted equipment increases regulatory uncertainty, which in turn hinders the pace of infrastructure roll-out.

IV. Lack of Regulatory Harmonization

As demonstrated in **Annex 1**, EAC member states have adopted different regulatory and legal standards. The lack of regional regulatory harmonization creates a dual burden for operators and passive infrastructure providers, which in turn hinders the pace of infrastructure deployment.

V. Legacy Bureaucracy and Red Tape

Legacy bureaucracy such as heightened wayleaves, excessive right of way requirements, reoccurring charges, and the absence of a central authority to manage all planning and construction related activity severely impacts the speed of infrastructure rollout. This is particularly evident when operators and passive infrastructure providers are required to obtain multiple certificates and authorizations from various authorities or in cases where the lack of policy harmonization in policies across and within the EAC region creates a stalemate in rollout efforts.

VI. Insufficient Identification and Protection of Telecommunications Infrastructure, and reoccurring Vandalism

Acts of vandalism of telecommunications infrastructure stifle infrastructure rollout and significantly increase the operational costs related to infrastructure maintenance. This has a domino effect on the infrastructure connectivity gap, as it also reduces operators, passive infrastructure providers and investors' confidence in market.

VII. Lack of Data on White Spots and Existing Coverage

Irregular reporting and the lack of a centralized data collection mechanism by national regulatory authorities leads to a situation where there is little data to support efforts to connect the unconnected, and often leads to duplication in infrastructure deployment, which in turn deepens the connectivity gap.

VIII. Lack of Basic Infrastructure and Impact on Maintenance of Telecommunications Infrastructure

The lack of basic infrastructure, including electricity and roads, particularly in rural and remote areas severely impacts the operations of and access to telecommunications infrastructure sites.

4. ADDRESSING THE INFRASTRUCTURE CONNECTIVITY GAPS

Addressing the infrastructure connectivity gap has the potential to add up to USD 180 billion to Africa's gross domestic product (GDP) by 2025, according to a recent report by Google and the International Finance Corporation (IFC).[2]

[2] Google and IFC (2020). "E-Conomy Africa 2020."

It is thus recommended that regulatory authorities across the EAC Region:

I. Encourage Infrastructure Sharing

By promoting infrastructure sharing, policymakers can trigger a multiplier effect on investment in digital infrastructure and services. For example, an EY study estimates that greater outsourcing to independent TowerCos (in Europe) could release an estimated EUR 28 billion of capital, which mobile network operators (MNOs) can re-invest in service delivery.

Infrastructure sharing also enables significant cost savings and efficiencies. A typical location of a wireless network operator managed by a TowerCo is 40% more efficient than one managed by an MNO, resulting in economic savings of EUR 31 billion across Europe between 2019 and 2029.

II. Develop an Infrastructure Sharing Strategy

EAC Member States are encouraged to develop an Infrastructure Sharing Strategy, which underscores the importance of infrastructure sharing, highlights the roles and responsibilities of stakeholders (all licensees who provide ICT and postal services, the national and municipal governments, consumers, consumer organizations, regulatory authorities, other government entities, including civil aviation authorities and roads authorities), as well as the associated legal and regulatory instruments. This will ensure clarity and provide certainty to stakeholders.

The infrastructure covered by the Strategy should include:

- Passive infrastructure, including masts, pylons, antennas, poles, towers, trenches, ducts, right-of-way, physical space on (and within the precincts of) Towers, Landing Stations, roof tops, offices, public buildings, broadcast studios, post offices, other premises, and offices available for use by ICT operators.
- Active Infrastructure, including Antennas, National Roaming Access, and Virtual Network Access facilities.
- Other physical installations used for the support or accommodation of electronic communications, including but not limited to in-building risers, campuses and estates, cable trays and cable entry points into buildings and shelter, and support cabinets.
- Any services necessary and incidental to the building, place, and premises in which electronic communications equipment is situated that are reasonably necessary or incidental to the sharing of any physical facility, including but not limited to electrical power supply, alarm systems and other equipment, air conditioning and other services.

III. Create New and Review Existing Infrastructure Regulations and Guidelines

Regulatory authorities should review existing infrastructure regulations and guidelines (or formulate new ones in the absence of existing regulations and guidelines) with a view of providing for clear mandates to encourage infrastructure sharing by operators and passive infrastructure providers. In doing so, regulatory authorities are encouraged to align regulations with local laws and international best practice.

IV. Coordinate Approach to Utilization of Right of Way

Because operators must first negotiate for wayleaves and ultimately pay for them, this represents a potential barrier to the timely deployment of broadband infrastructure. There is also the possibility that the negotiating parties may not reach an agreement, thereby denying other deserving citizens the necessary access to broadband services.

Considering the role played by wayleaves, there is a need for governments to develop polices to provide for different access rights, wayleave regimes and wayleave pricing regimes where necessary. This could include:

a) Requiring provision for telecommunication/ICT networks and infrastructure in any infrastructure projects pertaining to transport, electricity, and water distribution, and in State civil engineering works.
b) Require that property developers provide broadband telecommunication infrastructure in buildings.
c) Non-refusal for any operators or service providers wishing to install broadband telecommunication infrastructure in a property at their own expense with a view to providing connectivity for occupants.
d) Providing access to government rights of way, easing access to construction permits, easements, and access to government vertical assets, such as buildings and towers.

V. Allocate Financial and non-Financial Incentives for MNOs and passive infrastructure providers to further improve infrastructure rollout in rural and remote areas.

By providing financial incentives to encourage broadband infrastructure deployment, regulation can contribute to improving affordability. According to a World Wide Web Foundation, A4AI and UN Women Report, 23 out of 37 existing funds in Africa were active at the time of the study and an estimated USD 408 million remained unspent.

Turning this situation around demands a rethink of Universal Service Funds (USF), both in terms of their mission and their legal frameworks, but also reinforcing their institutional capabilities, shielding them from political interference and increasing transparency. The use of USF as a financing tool for digital infrastructure will also contribute to bridging the financing gap.

In addition, non-financial incentives such accelerated approval processes and reduced regulatory burden on telecommunications service providers will further accelerate infrastructure rollout.

VI. Establish a streamlined, digital framework for the granting of permits for the deployment of telecommunications infrastructure and encourage digital transformation across government.

Infrastructure roll-out efforts are often delayed by lengthy administrative process for the issuance of the required permits. As discussed in Section 3, this is further compounded by underlying barriers to deployments, including heighted need for wayleaves, the recurrence of excessive requirements by government agencies to secure rights of way, spurious fees and charges and legacy bureaucracy.

Many of these barriers, stem from administrative bottlenecks within municipalities who, in the absence of national policies harmonizing process and standards for wayleaves, have legislative autonomy over such manners.

The establishment of streamlined deployment-friendly permitting framework would facilitate faster network rollout. Permit applications should be digitized and fully completed online to expedite the granting of permits. In addition, a focal point (single window) for all permitting and deployment-related inquires will further facilitate network resilience.

VII. Harmonize ICT Policies, Laws, Regulations, Rules, Guidelines and Standards with EAC

Regulatory harmonization provides certainty to operators and encourages investment in telecommunications infrastructure, which in turn accelerates the pace of broadband deployment. In addition, by harmonizing policies, laws, regulations, rules, guidelines and standards, regulatory authorities in the region will eliminate the instances where regulatory 'double burdens' have dissuaded market entry.

VIII. Designate Telecommunications Infrastructure as Critical National Infrastructure and Award them adequate protections

To support the rapid deployment of Broadband networks in currently underserved areas it is essential to identify critical infrastructure nodes and designate telecommunications networks (including passive infrastructure) as critical national infrastructure. The relevant protection can then be afforded to this infrastructure to ensure they continue to deliver value to the communities they are meant to serve.

IX. Develop Model Infrastructure Sharing Guidelines for EAC Member States

In 2017, EACO Developed Model Guidelines for Co-Location and Infrastructure Sharing, which established a framework within which licensees can negotiate and enter into an Infrastructure and Frequency Sharing Agreements for the purpose of:

- Minimizing infrastructure duplication.
- Reducing the carbon footprint associated with the deployment of telecommunications infrastructure.

- Increase efficiency in the use of spectrum.
- Promoting competition through equitable access to communication resources
- Harnessing the economic advantages of minimizing capital expenditure on infrastructure and freeing more funds for investment in the provision of communications services.

The 2017 Guidelines further highlighted requirements for Open Access and Infrastructure, which include:

- All Infrastructure must have the provision to accommodate more than one licensee.
- Infrastructure Providers shall share infrastructure with other licensees on a just and reasonable and non-discriminatory basis.
- A licensee seeking to build passive infrastructure at a particular location shall ensure that it is not feasible to be hosted by an Infrastructure Provider on infrastructure sharing basis including due to technical or capacity limitations.
- Infrastructure Provider shall avail their Passive Infrastructure for sharing with other licensees.
- Infrastructure Provider shall be required to avail excess capacity of their Active Infrastructure for sharing with other licensees.

The 2017 Guidelines also highlighted General Terms and Conditions for Infrastructure and Frequency Capacity Sharing, which include:

- Commitments to enable access to infrastructure on a non-discriminatory "first come, first serve" basis.
- Commitments to file independently negotiated Infrastructure Sharing Agreements with regulatory authorities.

On Requests for Sharing Infrastructure the 2017 Guidelines noted that:

- An Infrastructure or Frequency Capacity Provider shall reply in writing within 30 days of a written request for infrastructure or Frequency Capacity sharing from an Infrastructure or Resource Seeker;
- Where the Infrastructure or Frequency Capacity Provider indicates its readiness to share infrastructure or resource, the parties shall commence negotiations within 60 days from the date of the reply;
- Where the Infrastructure or Frequency Capacity Provider is not in a position to share the requested Infrastructure or Resource, the Infrastructure or Frequency Capacity Provider shall reply in writing to the Infrastructure or Resource Seeker within the timeline in paragraph (1) and also write to the National Regulatory Authorities (NRA) detailing the reasons for refusal to share the requested Infrastructure or Resource.

On Co-location of Infrastructure, the 2017 Guidelines noted that:

- A request to facilitate co-location of an Infrastructure Seeker's facilities on an Infrastructure Provider's premises shall be considered as a request for sharing passive infrastructure.

- An arrangement/agreement for co-location shall specify the cost of the co-location in addition to specifying the modalities of access by the Infrastructure Seeker to the premises for-
    - Maintenance and fault clearance of its facilities including late night visits;
    - Emergency access and the timelines;
    - Cleaning, safety, and security of the Infrastructure Seeker's facilities.

On Negotiations on Infrastructure and Frequency Resource Sharing the 2017 Guidelines noted that:

- Both the Infrastructure or Frequency Capacity Provider and the Infrastructure or Frequency Capacity Seeker shall negotiate -
    - In good faith;
    - Endeavour to arrive at a reasonable Infrastructure or Resource sharing arrangement/agreement;
    - Not obstruct and or delay negotiations;
    - Not intentionally mislead the other party;
    - Not coerce the other party into making an agreement that it would not otherwise have made;
    - Not refuse to provide information relevant to the negotiations or agreement; and
    - Must designate proper representative to expedite negotiations.

In doing so the Guidelines emphasized that sharing agreements should be left to operators to negotiate and that regulatory intervention on infrastructure-sharing costs should be a matter of last resort as it disregards market dynamics, including the willing buyer – willing seller and does not allow for price differentiation based on demand and competition.

The 2017 Guidelines provide a useful reference for EACO Member States to consult to boost infrastructure sharing and accelerate infrastructure deployment.

5. CONCLUSION AND RECOMMENDATION

Addressing the infrastructure connectivity gap has the potential to add up to USD 180 billion to Africa's Gross Domestic Product (GDP) by 2025, according to a recent report by Google and the International Finance Corporation (IFC).[3]

Increased infrastructure sharing contributes directly to addressing the connectivity gap by reducing the costs of broadband deployment, while simultaneously increasing operational efficiencies and reducing carbon emissions. This is expected to generate substantial benefits to the EAC region and contribute to its economic development.

[3] Google and IFC (2020). "E-Conomy Africa 2020."

Accordingly, national regulatory authorities across the EAC region should encourage infrastructure sharing, taking into consideration four main principles:

a) Negotiation:

Infrastructure owners and those seeking to collocate, or share shall be encouraged as much as possible to negotiate and come up with terms agreeable to them. Regulatory intervention shall only be in situations where no agreement is reached.

b) Efficiency

Infrastructure will be done with a view to Cost reduction for new entrants and Capex / Opex optimization for infrastructure owners.

c) Environmental concern

Noting that Infrastructure installations impact on the environment, sharing shall be facilitated and encouraged where there is evidence of no adverse effects on the environment.

d) Competition:

Infrastructure sharing will be highly encouraged and facilitated by the regulator where it is noted that it will facilitate entry to the market for new entrants and thus foster competition.

Elsewhere, national regulatory authorities are encouraged to:

1. Identify critical infrastructure nodes; designating telecommunications networks, including passive infrastructure as critical national infrastructure, and affording them the relevant protection.
2. Categorizing telecommunications services and workers as essential services/personnel.
3. Encouraging regulatory harmonization and streamlined regulatory frameworks for infrastructure deployment and service access at the regional and national levels.
4. Accelerating digital transformation and establishing a digital framework for all deployment-related permits and authorizations.
5. Expediting approval procedures for all deployment related permits and authorizations, including by encouraging faster responses from other regulatory authorities and state agencies. This will also include working with state agencies to harmonize, centralize and digitize approvals/permits/processes.
6. Encouraging the efficient use of Universal Service Funds, including for the provision of subsidies to accelerate infrastructure deployment in un-served and underserved areas.

7. Strengthening regional and international cooperation in telecommunications development through sharing of regulatory best practices and capacity building initiatives.
8. Promoting regional interconnectivity and interoperability.
9. Enable access to power and a reliable power supplies to accelerate the pace of rollout in rural and remote areas.

Adopting these measures will help accelerate the deployment and maintenance of telecommunications networks across East Africa, contributing to achieving universal access and enabling the development of knowledge-based societies in the region.

ANNEX 1

Obligations of Stakeholders Involved in Infrastructure Sharing

For certainty and efficiency on how infrastructure sharing will be handled it is prudent to define upfront the roles and obligations of each stakeholder involved.

- National Government: This comprises of the Ministry in charge of ICT issues and the National Communications Secretariat. These are in charge of developing and setting the general national ICT policy. This policy sets out the government's desire with regards to telecommunications infrastructure

- County/Municipal Governments: The county governments are in charge of issuing rights of way. Since telecommunication infrastructural constructions will require approvals or rights of way, efficient, and cost-effective one-off approval processes will be key in facilitating telecommunication infrastructural developments. County governments can also ensure that all commercial building have common ducts for telecom infrastructure.

- National Environmental Management Authorities (NEMA) which approves all projects based on the submitted Environmental Impact Assessment (EIA) reports. The NRA and NEMA therefore using the existing framework of cooperation should devise means for efficient approval of EIA reports.

- Roads Authorities: During construction of roads, the design of roads should include common ducts, where telecom infrastructure can be laid by all operators. This will eliminate the need for each operator excavating sections of the roads for their telecom infrastructure. In addition, Telecommunications Regulatory Authorities are encouraged to raise awareness of the need to accommodate telecommunications infrastructure, when engaging Roads Authorities.

- Civil Aviation Authorities and Defence Ministry: These organisations are tasked with ensuring safety of aviation (e.g. KCAA in Kenya) and national security (defense) infrastructure will require height approval. There is need for fast, efficient, cheap, cost effective **one-off** approval process. In addition, re-occurring charges (e.g. approval fees and annual inspection fees) should be avoided.

- National Regulatory Authority (NRA): the ICT regulator's main role will be to develop regulations, guidelines, dispute resolutions, and encourage telecom infrastructure sharing.

Risks and Mitigations

Like all projects telecom infrastructure sharing may pose risks which have to be identified and mitigated. Table 1 lists possible risks and how to handle them

Table 1: Risks and Mitigation

No	Risk	Description	Mitigation
1.	Increase conflicts	Sharing entities may be involved in constant conflicts with regards to share of ownership, maintenance costs, access rights , security	Detailed description of roles and responsibilities as well as rights of each member Elaborate dispute resolution mechanism
2.	Proprietary information Leakage	Proprietary strategic information is passed to competitor (accidently or on purpose)	Have non-disclosure agreement.
3.	Poor customer experience	Breakdown in end-to-end customer experience management	Have compensation policy Set and enforce minimum QoS metrics.
4.	Delays in sharing	Reaching an agreement between parties to share infrastructure may take unnecessarily long	Have clear timelines for decision to share

ANNEX 2:

Legal and Institutional Environment in EAC Partner States

Aspects considered under Legal and institution environment are: Privatization of the incumbent operator; ICT regulatory Framework, Existing regulations/guidelines on infrastructure facilities; licensing Framework; local ownership requirement and Infrastructure licensing procedures for undersea cables.

LEGAL AND INSTITUTIONAL ENVIRONMENT REGIONAL MATRIX

ASPECTS	**STATUS**				
	Burundi	**Kenya**	**Rwanda**	**Tanzania**	**Uganda**
Privatization of the incumbent Operator,	In Progress	Completed in 2008 Currently Government share is40% While 60% owed by Helios Investment Partners	Done in 2004 Government share 0%. For national backbone, a Joint venture was recently set up to manage the national backbone with Government of Rwanda 49% and Korea Telecom 51%. However there is No requirement in legislation for a minimum shareholding by the Government.	Completed in 2001 Government share 65%. But now (from 2015), the Government share is 100%	Completed in 2000 Government share 31%
ICT regulatory framework (converged or not)	Not yet converged	Converged	In the process of conversion	Converged	Converged

Laws **Regulations/guidelines** **Existing regulations/guidelines on infrastructure facilities**	**1997 Presidential Act** • Licensing • Type approval • Enforcement • Interconnection • Spectrum management	**KICA (Amendment) Act, 2013,** National ICT Master Plan 2019-2029 and the National Broadband Strategy 2018-2023**:** • Licensing • Spectrum management • Type approval • Competition regulations • Enforcement • Interconnection • Tariff regulation • Universal access • Consumer protection • Installation and maintenance regulation • Quality of service • Access and facilities regulations	**A new ICT Law enacted in 2016- Ministerial Orders** • Licensing • Type approval • Spectrum management • Enforcement • Interconnection • Universal access • Importation and distribution of electronic equipment • Guidelines on infrastructure sharing (tower, dark and duct fiber) established in 2009 and revised in 2011.	EPOCA, 2010 (Act No. 3/10) Regulations • The Electronic and Postal Communications (Access, Co-location and Infrastructure Sharing) Regulations, 2018.	**A new Act was enacted in 2013 and currently a review process of the regulations below is still ongoing.** **1997** • Licensing • Type approval • Spectrum management • Fair competition regulation • enforcement • Interconnection • Tariff regulation • Universal access

Licensing framework in general Annex the infrastructure providers	Vertical service specific ture	Technology neutral unified license • Infrastructure (NFP TIERS I,II,III) • Applications Service Provider • Content Service Providers • International Gateway and Landing Rights The Unified Licensing Framework is being reviewed to accommodate Community Based Networks as well as a new Infrastructure Licence categorization in line with prevailing market needs •	onsiders the Key Components: ture n	**Converged** • Network Facilities • Network Services • Applications Services • Content services Market segmentation • International • National • Regional • District	Unified • Public Infrastructure provider (PIP) licenses are being issued. This cuts across telecom & broadcasting
Local Ownership requirements	Not required	Local ownership 30% but can be waived by Government	Not required (No ownership requirements)	Not required	National Telcom Operators (NTOs) are required to

		(Ministry of ICT) vide Gazette Notice dated 9th April 2021 to review sector policy initially published in Nov 2008 where local ownership requirement was 20%. However BPO licenses are exempt from this rule			do local listing of at least 20% of the shares.
Infrastructure licensing procedures - • Who issues license • How is the license issued • Duration for acquiring the license • Duration of license	President of the republic issues licenses First come first served- Applications Not specified 15 years	Regulator First come first served + beauty contest Max 71 days 15 years for initial licence and 10 years on licence renewal	Regulator Tendering process No specific time as the tender may take long 15 years	Regulator Auctioning 60 days 25 years	Minister & Regulator Beauty Contest 190 days 15 years (to be provided)
Licensing requiremen	• Network facility	Landing Rights	Network facility	Network facility	• Network facility

ts for undersea cables.	license conditions	authorization <u>Pre- entry</u> Open access Create more competition <u>Post –entry</u> Open access framework Collocation Freedom of choice of backhaul users Ownership requirement exempted	license conditions. No License has been issued up to date.	license conditions	license conditions

Optical Fibre Infrastructure and Connectivity

Aspects considered under Optical Fibre Infrastructure and Connectivity area National Backbone capacity; National Backbone capacity; Ownership; National Backbone connectivity at borders points; Date of connection completion and redundancy and restoration arrangements; management of national backbone infrastructure; rights of way; cross boarder interconnectivity procedures.

STATUS MATRIX OPTICAL FIBRE INFRASTRUCTURE & CONNECTIVITY

	PARAMETERS	**STATUS**				
		Burundi	**Kenya**	**Rwanda**	**Tanzania**	**Uganda**
1	**National Backbone capacity (public & private) (Subject to definitions of specific countries)**	Initial capacity – 10Gbps	10Gbps- to get from annual report	127Gbps	200Gbps	Initial Capacity 40Gbps
2	**Coverage Annex (length in Kms, towns/regions connected. (2G,3G, 4G) (Maps to be annexed)**	1180 Km of length had already done 15provinces	Phase I of NOFBI: 4,300KM covered. PHASE II to cover 1600KMS, and starts May 2014 **To Date for Ph. 2:** 1,200km out of the 1,600km	All 30 tricts covered s Kigali tropolitan area l 9 borders ing Rwanda to anda, nzania, Burundi l DRC	24,928 Kms of Optical Fibre	3156Kms of optical Cables across 52 districts.

			civil works are completed. 900km of fibre has been laid in the backbone section. The backbone section is now complete and fibre installed in all the 47 counties Metropolitan fibre civil works has been completed in 35 of 47 counties. headquarters.			
3	**Ownership - Private, public or both**	Public and Private	Public and Private	Public Private Partnership (PPP), Private	Public and Private	Public and Private
4	**National Backbone connectivity at borders- points of border connection, synchronization**	• Ruhwa • Kobero • Mugina (Makamba)	• Namanga • Isebania • Busia • Malaba	• Rusumo Already	• Mutukula - Uganda • Horohoro - Kenya	• Malaba • Busia • Katuna • Mutukula

		• Kanyaruhaut • Gatumba • Gasenyi (Kirundo)	• Taveta • Holoholo • Lokichogio • Moyale • Mandera • Lungalunga	connected to TZ • Kagitumba Waiting UG • Katuna Already connected to UG • Cyanika Waiting UG • Goma Waiting DRC • Bukavu Waiting DRC • Akanyaru Already connected to BU • Nemba Already Connected to BU • Bugarama Waiting BU	• Rusumo - Rwanda • Sirari - Kenya • Kabanga - Burundi • Manyovu - Burundi • Tunduma- Zambia • Kasumulo – Malawi • Namanga – Kenya Service providers connected are in Rwanda, Burundi, Malawi ,Uganda, Kenya and Zambia	• Elegu • Vurra • Mpondwe • Oraba

				The next steps is focusing on the last mile solutions		
5	**Date of connection completion (dates of national backbone (phases)**	Phase 1 -2013 Phase 2 – sept 2014	Phase 1 completed in 2009 Phase 2. Began in Sept 2014	Phase 1 completed in 2010	Phase 1 June 2010 and Phase 2 June 2012	Phase I & II completed 2012/13 Phase III Completed December 2016 Phase IV launched 2019 and on going
6	**Redundancy and restoration arrangements**	Meshed network	Multiple separate fibers	Ringed circuits	Ringed circuits(3 rings- Northern, Southern and Western Rings)with IP-MPLS Network Planned 27 maintenance	Multiple separate fibers

					centers and 2 Network Observation Centers(NOC)	
7	**Management of national backbone infrastructure Government /Agency/ private**	Operation & Management are managed by Burundi backbone system under PPP arrangement.	Operations & Maintenance under Telkom Kenya Limited which is the incumbent operator (under review)	PPP with general management left to KT	TTCL Corporation appointed as backbone Manager on behalf Government so manages O&M activities.	Operation & management managed by PPP
8	**Rights of way issues (members to avail information on how rights of way issues are conducted in their countries) (this should provide some recommendation)**	No policy No rules and regulations.	Existing laws, under the county government. Open Access guidelines being developed.	Existing laws. a. On public land, application is addressed to Regulator who in charge search authorization from other involved government institutions	No policy – No rules and regulations. However all applications are addressed to local government authorities	Provisions in the Communications Act.

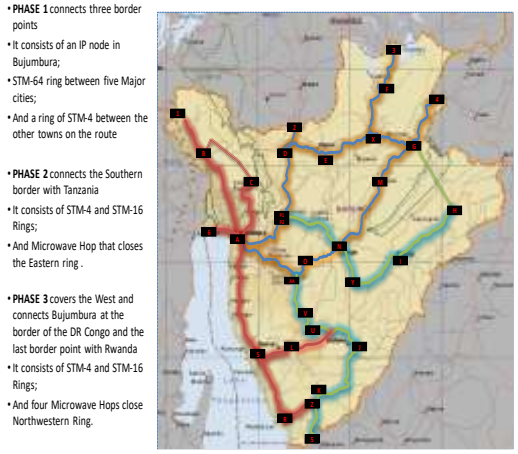
				and then the regulator will provide authorization and supervise execution b. On Private land Operators secure agreement with land owner then apply to Regulator. Regulator send request to concern district if no other activity are planned in that area. If OK then regulator issues authorization .		

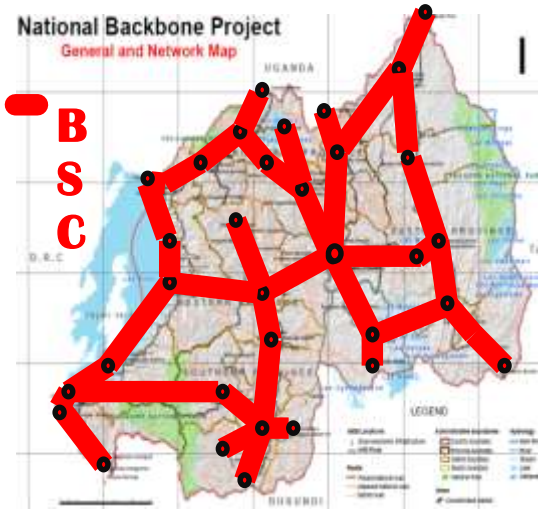
9	**Cross boarder Inter-connectivity procedures/requirements**	(to be confirmed later)	Not in place. Currently, operators enter commercial agreements.	Not provided in the legislation. Left to operators themselves	To sign MoU with NICTBB.	EAC Broad Band Interconnection regulations 2018 are yet to be signed.
10	**Open access** **a) Regulations on open access** **b) Technology neutrality**	Regulations on open access developed	Open Access Guidelines being developed	Open access and Technology neutrality: Yes	Technological neutral Regulation on access, co-location and infrastructure sharing, 2018	Technology neutral licensing regime is in practice. Infrastructure sharing regulations are being developed.
11	**Procedure for cross boarder interconnection (no man's land connection)**	Procedure for cross border interconnection in place	No procedure in place. A special Agency vehicle proposed	In No man's land The regulator has been giving authorization subject to informing Immigration and emigration	To sign MoU	To sign MoU

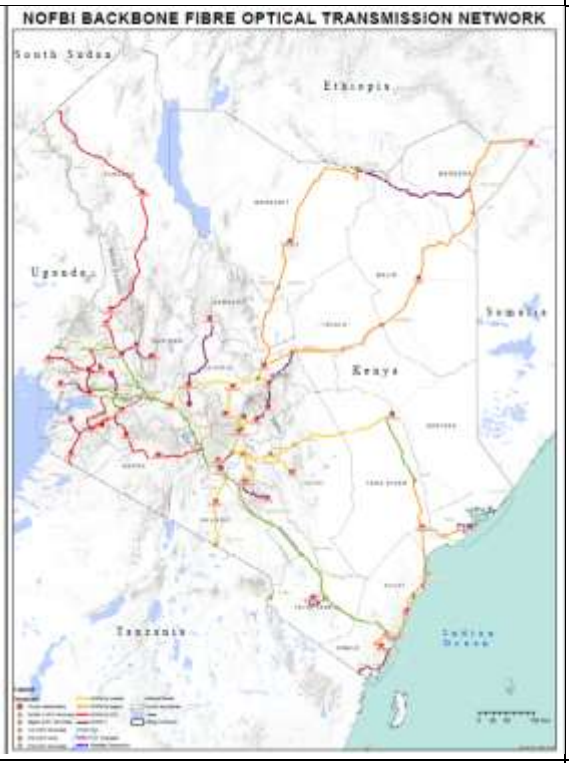
12	**Leasing dark fibres, micro-ducts, ducts(policy existence, existing dark fibre, micro-duct, ducts leasing arrangement)**	No procedure in place	No procedure in place.	Leasing infrastructure is mandatory in our legislation except in some specific cases provided in the legislation	Not yet approved at the Backbone. Metro is approved	Infrastructure sharing guidelines are being developed.

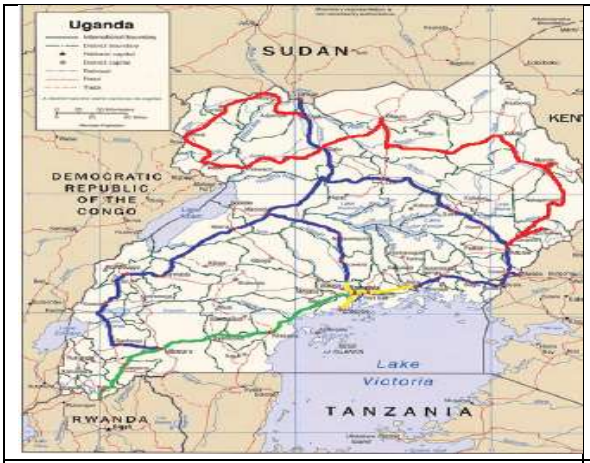
Note that South Sudan has two commercial Fiber Internet Providers who launched operations in 2020

Maps Showing Fibre Routes in EACO Region as of December 2018









Relevant Statistics on Infrastructure Development and Connectivity

Relevant Statistics on Infrastructure Development and Connectivity are presented in table below;

Indicators	Kenya	Tanzania	Uganda	Rwanda	Burundi
Population of the country	53,771,296	57,637,628	42,000,000	12,952,218	11,890,784
Population density (per sq km)	94	57	173	491	414
Telephone subscribers (X 1000)	61,430	51,293	27,700	10,614	6,959.541
Fixed telephony (X 1000)	16.003	72.5	9.0774	11.784	18.061
Mobile telephony (X 1000)	61,410	51,220.23	27,688.987	10,614	6,941.488
Internet Subscribers (X 1000)	44,380	28,470.51	21,408.457	8,240.259	1,228.569

Internet users (X 1000)	70.16	28,470.51			
International bandwidth (Submarine cable in Mbps)	8,085,970		26,539	127,558	10,000
International bandwidth (Satellite in Mbps)	5,460				10,000
Mobile Teledensity (% population)	129.1	81%	67%	82%	56.4%
Area coverage by 2 G network (%)	52.9%	66%	85%	98%	97%
Area coverage by 3G network (%)	56.3%	14%	75%	98%	48%
Area coverage by 4G network (%)	56.3%	<14%	47%		25%
Population coverage by 2G network (%)	95.7	94%	99%	99%	97%
Population coverage by 3G network (%)	96.3%	45%	96%	97%	48%

Population coverage by 4G network (%)	96.3%	25%	80%		25%
Broadband subscriptions (>256 Kbps)	25,780,000	861,233	32,262		
TV penetration	5,404,827 subscribers	5.1%	1,616666		75%