TAASISI YENYE VIWANGO VYA UBORA VYA ISO 9001:2015

THE Regulator

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ISSN: 0856 -8030 | NO. ISSUE 4/2022 October - December 2022

Quarterly magazine of the Tanzania Communications Regulatory Authority



Spectrum Auction

TCRA and National Priorities

Licensing supplement

ISO 9001:2015 CERTIFIED

TANZANIA COMMUNICATIONS REGULATORY AUTHORITY

Stakeholder Education series (2)

Amendments of the Radio Communication and Frequency Spectrum Regulations

The Electronic and Postal Communications (Radio Communication and Frequency Spectrum) Regulations which were amended in September 2022 are summarized below:-

Amendment of regulation 27 2. The principal Regulations are amended in regulation 27, by (a) deleting sub-regulation (8) and substituting for it the following

"(8) Save for spectrum sharing arrangement authorized by the Authority under the Electronic and Postal Communications (Access, Colocation and Infrastructure Sharing) Regulations, 2018, a licensee shall not enter into any arrangement to lease, pledge or sell radio frequency spectrum or frequency channels assigned or allocated."; and (b) deleting sub-regulation (9).

Addition of sections 27A and 27B 3. The principal Regulations are amended by adding immediately after regulation 27 the following: "Review of spectrum upon merger or acquisition".

27A.**-(1)** Subject to sub-regulation (2), where companies licensed under the Act and assigned frequency spectrum enter into merger or acquisition, the Authority shall review the spectrum allocated to the companies and consider reassignment of the radio frequency spectrum to the acquirer.

(2) Save for microwave frequency spectrum, the acquirer shall only be entitled to the following spectrum cap – (a) Not more than 2 x 35 MHz of below 1 GHz spectrum bands (700MHz, 800MHz and 900MHz); (b) The intra-band cap of 35% of the spectrum in 1800MHz, 2100MHz and 2600MHz FDD band; or (c) The intra-band cap of 40% of the spectrum in 2300MHz, 2600MHz, 3300MHz and 3500MHz TDD: Provided that, where there are frequencies above the cap described in paragraphs (a) to (c), and such excess frequencies cannot be reallocated for provision of services, the Authority may re-allocate such frequencies to the acquirer.

(3) In the case of Frequency Modulation (FM) radio broadcasting spectrum, an acquirer shall only be entitled to not more than one frequency per the licensed service area:

Provided that, whereas the result of merger or acquisition the merged entity or the acquirer gains more service areas than the existing licensed service areas, the merged entity or the acquirer shall be obliged to apply for an upgrade of the licence.

(4) Any extra spectrum above the cap under sub-regulations (2) and (3) shall be retained by the Authority for allocation and assignment in the manner provided under these Regulations.

(5) Where a merger involves licensees with Microwave frequency spectrum, the acquirer may keep the spectrum which was held before the merger.

(6) An acquirer shall be required to submit a revised rollout plan to the Authority.

(7) For efficient utilization of spectrum, the acquirer assigned any of Class A spectrum (700MHz, 800MHz, 900MHz, 1800MHz, 2100MHz) shall be required to meet the following mobile broadband coverage obligations- (a) population coverage of not less than 60% by end of the third year of the merger; (b) population coverage of not less than 90% by the end of the sixth year; and (c) the quality of service requirements as set out in the Electronic and Postal (Quality of Service) Regulations.

(8) The tenure of the spectrum user licence for the spectrum obtained through the merger shall be the same as the tenure of the spectrum user licence of the acquirer.

(9) The spectrum acquired upon merger or acquisition shall be subject to fees as prescribed in the Schedule of these Regulations.

Powers to issue Guidelines 27B. The Authority may issue guidelines on review of spectrum upon merger or acquisition."

The principal Regulations are amended by adding immediately after regulation 38 the following Schedule:

SPECTRUM FEES ON MERGER OR ACQUISITION

1. Where a merger or acquisition involves a licensee with the spectrum obtained through auction, the spectrum shall not be subjected to any fees.
2. Where a merger or acquisition involves a licensee with the spectrum obtained administratively, the following fees will be paid to the Authority: -
   a) USD 160,000 per 1MHz for Class A spectrum (700MHz, 800MHz, 900MHz, 1800MHz, 2100 MHz); b) USD 50,000 per 1MHz for Class B spectrum (2300MHz, 2600MHz); c) USD 10,000 per 1MHz for Class C spectrum (1850MHz, 1900Mhz, 3.3GHz, 3.5GHz, 4GHz and above.
3. After merger or acquisition, the merged entity or acquirer will continue to pay the annual spectrum user fees as prescribed in the Electronic and Postal Communications (Licensing) Regulations and Licence conditions."

Registration No. 00000115
October - December, 2022

The Regulator is published quarterly by the Tanzania Communications Regulatory Authority (TCRA). The Authority's functions and duties include enhancing public knowledge, awareness and understanding of the regulated goods and services, and disseminating information about matters relevant to its functions.

TCRA is an independent Government agency established under the Tanzania Communications Regulatory Authority Act No. 12 of 2003 to regulate electronic and postal communications in Tanzania.

Specifically, the Authority is responsible for enhancing the welfare of Tanzanians through:

- Promoting effective competition, economic efficiency
- Protecting consumers
- Promoting the availability of regulated services
- Licensing and enforcing licence conditions of broadcasting, postal and telecommunications operators
- Establishing standards for regulated goods and services
- Regulating rates and charges (tariffs)
- Managing the radio frequency spectrum
- Monitoring the performance of the regulated sectors
- Monitoring the implementation of ICT applications.

TCRA has offices in Zanzibar and in five zones - Northern (Arusha), Lake (Mwanza), Central (Dodoma), Southern Highlands (Mbeya) and Eastern (Dar es Salaam).

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Strategic Objective	Strategies
Efficient, reliable and secure postal and electronic communications infrastructure and applications promoted	Strengthen communication resources management • Improve postal and electronic communications infrastructure performance • Strengthen cybersecurity management capability
Accessibility, affordability and quality of electronic and postal communications services enhanced	•Promote access to communications services in underserved and unserved areas; • Promote accessibility and use of postal and electronic communication services; • Strengthen public awareness and education on regulated services
Regulated services, innovation, local contents generation and localization enhanced	Foster innovation, research and studies on emerging issues •Facilitate local content generation and dissemination
Performance of regulated services and stakeholders' protection enhanced	Strengthen Licensing Management • Enhance compliance to laws, regulations, guidelines, rules and standards • Foster competition and Market Performance • Strengthen collaboration approach to regulation • Strengthen public awareness and education on regulated services • Strengthen National human safety and security through ICTs • Enhance Regional and International Collaboration
Institutional Capacity Enhanced	Strengthen Corporate Resources Management • Strengthen Organization systems and processes • Improve working environment • Enhance Corporate Image and Reputation • Strengthen Planning, Monitoring and Evaluation.

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One of TCRA's vehicles equipped with mobile frequency monitoring and direction-finding equipment.

Letter from the Editor

Spectrum, licencing management

Tanzania has once again blazed Africa's regulatory trail after successfully auc-tioning spectrum in four prime bands in which 187 million dollars were realized. Like the first in 2018, the auction on 11th October 2022, which was internally managed and involved stakeholders at all levels has been described as world- class. This is extensively covered in both editions.

We have a supplement on licensing, covering all the sub-categories of the four main licences which were first categorized in 2005 when Tanzania became the first country in the continent to introduced a converged licencing framework.

The Kiswahili section has a comprehensive report on developments in the sector between July 2021 and September 2022. Application services licences increased by about 40 per cent, from 66 to 107 in the period. signaling a speedier penetra-tion and uptake of internet and data services.

Eng. Khatib new TCRA Board Chairman

PRESIDENT Dr. Samia Suluhu Hassan has appointed Engineer Othman Sharif Khatib (pictured) Chairman of the Tanzania Communications Regulatory Authority (TCRA). He replaces Dr. Jones K. Killimbe.

Eng. Khatib is a Professional Telecommunication Engineer with a vast experience in the communications sector and has served in the Revolutionary Government of Zanzibar (SMZ) and State Institutions of the Government of the United Republic of Tanzania in various capacities.

He was appointed Chairman of the Tanzania Communications Regulatory Authority (TCRA) in September 2022.

Eng. Khatib has a Master of Science degree (MSc) in Telecommunications from Hochschule fuer Vehrkehrswessen, Dresden, Germany. He has attended several courses in telecommunications, leadership and communications regulation from various international training centres.

He has held different positions including Deputy Director of Spectrum Management, at the Tanzania Communications Regulatory Authority (TCRA), TCRA Manager for the Zanzibar Office, Principal Executive Engineer, at the then Tanzania Post and Telecommunications Corporation (TPTC), Principal Executive Engineer at Tanzania Telecommunication Company Ltd (TTCL) and Radio Technician, Ministry of State Zanzibar. He retired from TCRA in December 2019.



Engineer Khatib has been a board member of different professional bodies including the Engineers Registration Board (ERB) and Board Member of the Advisory Board to Zanzibar ICT Infrastructures Agency (ZICTIA).

The TCRA Board of Directors is the Authority's governing organ, consisting of seven members. These are the Chairman and Vice-Chairman, four members and the Director-General.

Promoting inclusive Digital, Blue economies in Tanzania

Message of the Tanzania Communications Regulatory Authority (TCRA) Director General, Dr Jabiri Kuwe Bakari, on the African Telecommunications Union (ATU) Day, 7 December 2022

THE African Telecommunications Union (ATU) celebrates its 45th anniversary on 7 December 2022. The Tanzania Communications Regulatory Authority (TCRA) joins the worldwide communication community on this momentous occasion; under the theme - "Enhancing Financial Inclusion through ICT."

Communication services are provided in a competitive environment, resulting in the evolution of more communication networks, information and Communications Technologies (ICT), and other related services for communities, institutions, and the government.

TCRA, which regulates the development and application of communications technology and other ICT-related services in Tanzania, has ensured that telecommunication infrastructure helps the growth of an inclusive economy.

Thus, health, entrepreneurship, agriculture, innovations, digital technologies, education, international trade, transportation, and other multiple sectors grow at a pace that contributes to Tanzania's economic growth.

Evidence of the growth is in how well people use digital and mobile money services.

We at TCRA are determined to ensure that all ICT- based economy-supporting infrastructures are well-managed and regulated. TCRA has continued to carry out its duties in line with the telecommunications sector objectives outlined in the National Development Vision 2025 and the Third Five-year National Development Plan (FYDP III).

TCRA contributes to the collaborative economy by ensuring its regulatory functions lead to strengthening communication infrastructure and access to communication services; to improve the digital and blue economies.

It will continue to create a better environment for competition in the communications sector to enable many citizens to afford the costs of services; use administrative systems to protect users of communication services against cybercrime. TCRA will also continue to assign spectrum and licence service providers, to increase internet users to reach Tanzania's internet penetration goal of 80 per cent by 2025.

Through research and collaboration, TCRA will continue to promote an environment that stimulates



the growth of investment in the broader telecommunication sector, particularly investments in cutting-edge technologies and infrastructure that enable and stimulates economic growth.

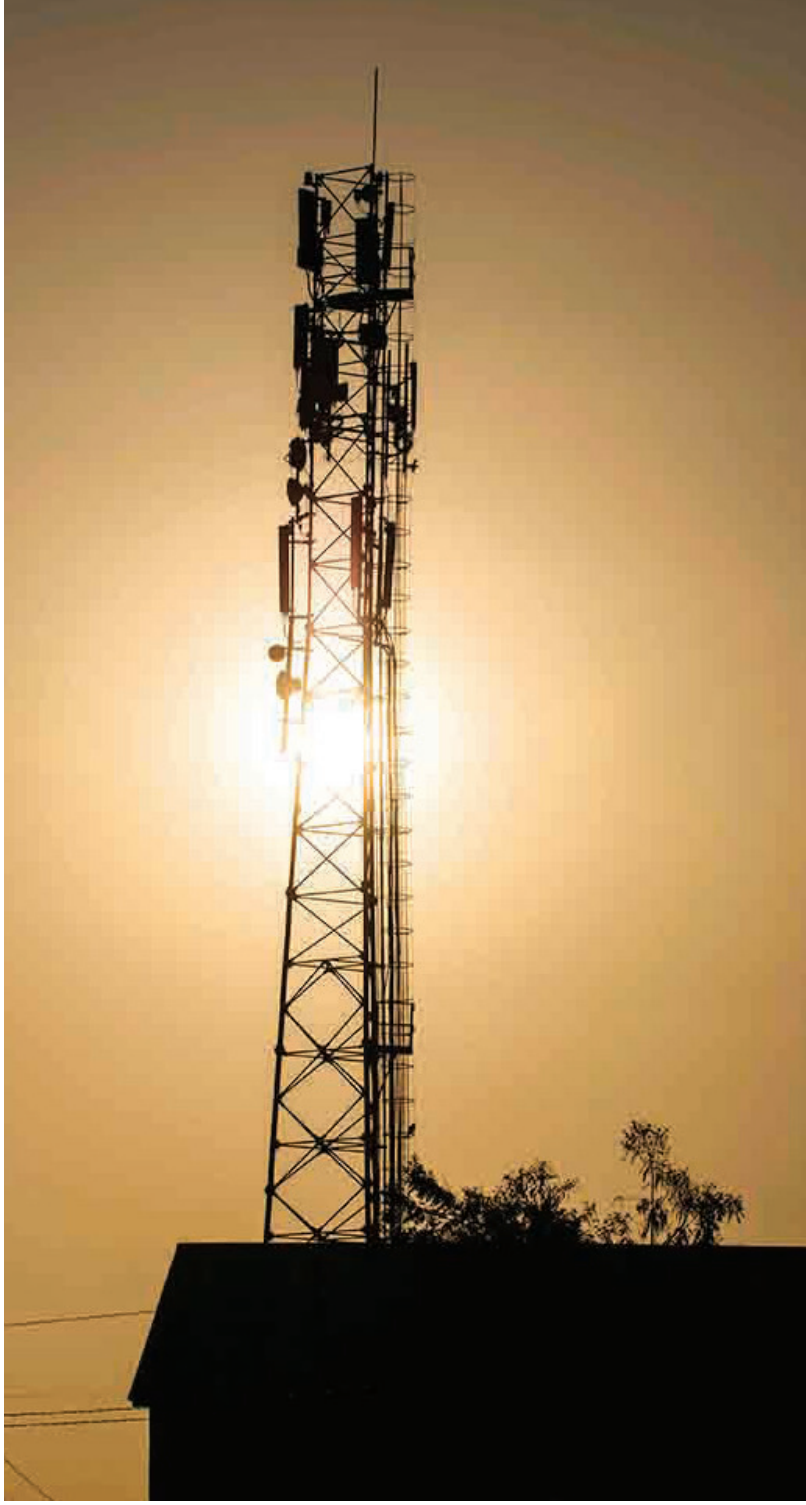
As part of TCRA's digital economy promotion foresight and an initiative to promote the growth of a diverse and inclusive digital and blue economy, the Authority will continue to provide start-ups and innovators in Tanzania with cost-free access to valuable and scarce communication resources like the frequency spectrum, short- codes or USSD codes, numbering resources, and dot TZ domain names.

A diverse and inclusive digital economy requires good planning and management of communication resources, especially frequency spectrum and numbering resources. These are necessary to enable service providers to have access to the resources needed.

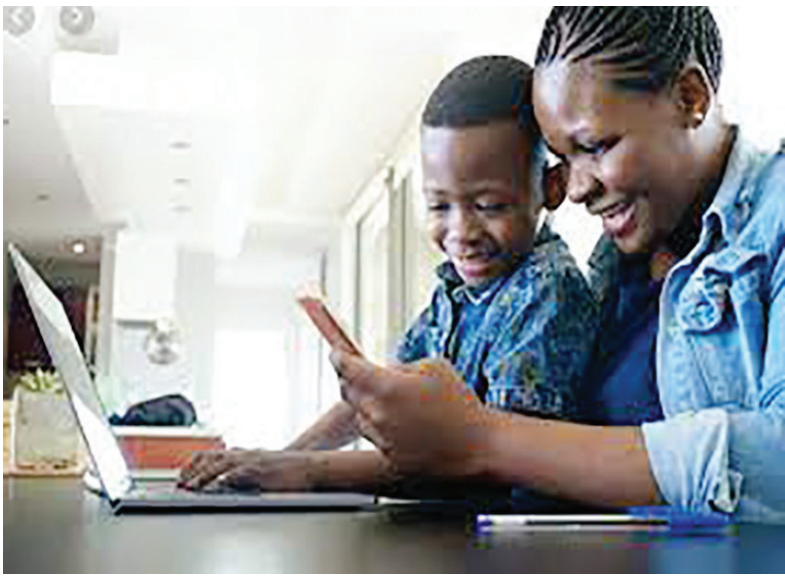
Prudent sector administration will facilitate effective citizen engagement in accessing financial services.

At TCRA, we believe that an inclusive economy will be established by a well- integrated and active society through reliable, affordable, universally accessible, and high- quality telecommunications and internet systems. As part of our efforts to make this a reality, we collaborate with multiple stakeholders within and outside Tanzania to ensure that communities are well served.

I conclude by emphasizing that TCRA places a high priority on educating the public on the productive and secure use of the internet, telecommunications, and ICT systems in general so they benefit the people, who are the target and primary beneficiaries of the Digital Economy and Blue Economy. Promoting an equitable economy requires collaboration with all stakeholders, including ATU, the private sector and government institutions responsible for ICTs, finance and regulation.







Spectrum auction propels Tanzania to new regulatory heights



The recent auction of four prime radio spectrum bands in Tanzania for 187 million US dollars through an internally-managed process is set to be benchmarked throughout Africa in terms of regulatory foresight, stakeholder engagement and implementation of sectoral policies.

The Tanzania Communications Regulatory Authority (TCRA) auctioned 11 blocks of spectrum in the 700Mhz, 2300 MHz, 2600 MHz and 3500Mhz bands on 11 October 2022 and some were bought at almost thrice the reserved price.

The auction, designed and managed solely by TCRA's internal team, bore the hallmark of international best practices, from the design to the final award phase. Tanzania's five leading mobile network operators participated, with four bagging spectra in different bands

The 3500 MHz bands is preferred in the deployment of the superior 5G mobile communications standard, which is expected to be key in Tanzania's strategy to lay firm foundations for a digital economy by 2025.

TCRA's experience in the 2018 auction of two blocks in the 700 MHz band, through a consultancy, the confidence of the Authority's engineers, lawyers, economists and analysts; coupled with the industry's readiness to roll out new services contributed to the success of auction on 11 October 2022.

All 11 blocks in the four bands were auctioned, some at almost three times the reserve prices; reflecting the extent to which operators value spectrum, are ready to pay a premium and are committed to its efficient use.

"The auction was demand-driven. It was in response to the requests from existing operators who had shown interest to acquire additional spectrum to meet demands arising from new technologies and services", TCRA Director General, Dr. Jabiri Kuwe Bakari explained.

TCRA owes the success of the auction to several factors, some of them being the objectives for which the spectrum was being auctioned; the design of the spectrum blocks, the calculation of the reserve price based on the economic, technical and market situation in Tanzania and the flexible payment options.

The technical study included a valuation of the spectrum assigned to all licensees and its use. The objective was to ensure that all 11 blocks on the four earmarked bands would be auctioned.

Extensive stakeholder consultations to enhance their confidence in the process, openness, transparency, and rationality in enforcing winners' roll-out obligations and the choice of the appropriate auction format also contributed to the success.

TCRA's first spectrum auction in 2018 offered only two blocks of spectrum in the 700 MHz band, and they were bought at the reserved price by two service providers.

TCRA also avoided the bad experiences of other countries where spectrum auctions had either failed or met serious legal and regulatory challenges. For the latter, participants were required to have an irrevocable power of attorney, partly to avoid the possibility of participating parties being forced by their principals to withdraw during the bidding, negatively affecting the process.

TCRA explains that the auction was designed to achieve the objectives of Tanzania's Information and Communications Technology (ICT) Policy of 2016; objectives

which state that spectrum should be assigned to service providers able to generate the greatest socio-economic benefit from its use.

It is also envisaged that the auction would simultaneously promote competition, investments and innovations and improve services in terms of availability and quality.

The auction was pegged on enhancing Tanzania's mobile and fixed broadband infrastructure as a precursor to the development of the digital economy.

It is also expected to bring more socio-economic benefits as mobile and fixed broadband will be key for promoting the efficient provision of services such as education, health, agriculture, commerce, and financial services through ICTs.

It is also anticipated that the auctioned spectrum would lower mobile communications costs due to cost savings and therefore potentially lower consumer prices.

Also desired was enhancing the quality of services and the quality of experience through coverage and capacity improvement and extending the provision of mobile broadband services to a wider Tanzanian population, especially those in rural areas.

It is also expected that this would promote, enhance and facilitate innovations for new ICT services and technologies to be deployed in the bands.

With the reserve prices initially set at a total of 58.3 million US dollars, the auction was also expected to generate revenue, and it surpassed the target by 300 percent.

TCRA published a public notice on its intention to auction the four bands; with a timeline for each activity. The notice was designed to provide sufficient information to stakeholders so they could make an informed decision on their participation in the auction.

A comprehensive auction manual in the form of a consultation document was also developed and shared with all licensees. The document, which was described as "simple and clear as possible' outlined all the aspects of the auction such as the reserve price, coverage obligations, the bidding mechanism, the award process and even a checklist.

There was a provision for questions and answers and comments and proposals from stakeholders. TCRA's engagement with all mobile network operators started even before the publication of the first information memorandum, as part of maintaining a level playing field. Licensee feedback and the Authority's response were shared with all, to ensure transparency and openness.

Some of the service providers' inputs adopted and incorporated by TCRA in the final auction document were on auctioning the spectrum blocks in sequence, i.e. bidders placing bids on one band at a time instead of a single set of sealed bids covering all bands in one session. This was intended to enable unsuccessful bidders in one block to know the outcome of previous bids so they could respond appropriately.

The design of the auctioned blocks was based on the International Telecommunication Union (ITU) regulations and guidelines on the International Mobile Telecommunications (IMT) bands, including the four that were auctioned.

There was one block of 2×10 MHz of spectrum in the 700 MHz band, two (2) Blocks of 1×35 MHz spectrum in the 2300 MHz band and four (4) Blocks of 1×40 MHz spectrum in the 3500 MHz bands. The 2600 MHz band had three Blocks of 2×15 MHz and one Block of 1×20 MHz.

TCRA maintained that the proposed block sizes were expected to enhance spectral efficiency. However, it gave winners options to split the won blocks into smaller block sizes during deployment to suit their needs.

The reserve prices for the auctioned blocks were set in US dollars under the provisions of the Licensing Regulations of 2018; developed under the Electronic and postal Communications Act (EPOCA). In calculating the reserve price of each block, TCRA considered the situation of Tanzania's telecommunications market, the value of spectrum as a scarce resource and other economic factors.

There were 58,032,985 active SIM cards on the market in September 2022. Mobile phone services are provided by five companies, the market share of which is shown in brackets: Vodacom (30%), Airtel (28%), Tigo/Zantel (26%), Halotel (13%), and TTCL (3%).

Although some licensees

proposed a reduction of the reserve price for the respective blocks arguably to 'ensure the maximum auction participation and bids attraction', most of the bids were much higher.

The reserve prices in US dollars were 17 million for one 2×10 MHz Block in the 700 MHz band; eight (8) million for one 1x40MHZ block in the 3500 MHz band; and six (6) million for one 1×35 MHz Block in the 2300 MHz band. The price of one 2×15 MHz Block in the 2600 MHz band is five (5) million dollars and 3.3 million for a 1x20 MHz block in the same band.

The results showed an unexpected readiness by mobile network operators to pay more. One block of 700 MHz (FDD) was bought for 25.54 million US dollars, two of 2300 MHz (TDD) for 34.37 million US dollars; two of 3500 MHz (TDD) for 21.1 million US dollars and two of 2600 MHz (FDD) for 39 million US dollars.

Two blocks of 3500 MHz (TDD) went for 34 million US dollars and one of 2600 MHz (FDD) for 30.1 million US dollars. Only one block, in the 2600 MHz (TDD) band was sold at the reserve price of 3.3 million US dollars.

With the final bids well above the reserve prices, TCRA cleared a potential hurdle. High reserve prices have led to the failure of auctions in at least two neighbouring Southern African Development Community (SADC) member countries.

In one, the auction was postponed after failing to attract bidders. In the other country, licensees were invited to bid for spectrum in the 800MHz and 2600MHz bands but the 40MHz block in the latter band was left unsold due to a high reserve price.

In the TCRA auction, all successful bidders were given coverage and quality of service obligations to ensure adequate coverage and that consumers fully benefit from access to mobile broadband services. The final target dates and mode of coverage were revised after consultations, and TCRA gave licensees the option of using any technology or any combination of spectrum bands to deliver.

Successful bidders granted a licence for the 700 MHz band is required to provide broadband services to 90 per cent of Tanzania's population by the end of the year 2028 and 95 per cent by 2033 at the specified quality of service levels.

Those awarded the 3500 MHz spectrum must maintain a geographical presence in at least six (6) different administrative regions of the United Republic of Tanzania by 2025 and all regional headquarters by the end of 2032.

TCRA has not attached coverage obligations to 2300 and 2600 MHz bands because it wants them to be used to improve the capacity of existing networks.

To ensure the integrity of the auction process TCRA required all bidders to have a bank guarantee of US Dollars 3,000,000 which would be refunded to unsuccessful bidders after the auction or form part of the winners' first instalment.

Winners were given the option of making a lump sum payment of the bid amount or in three instalments of 50 per cent within two weeks, and 25 per cent each every subsequent six months respectively.

TCRA reports that all the winning bidders had paid the first instalment by the close of business on 25 October 2022.

With the successful assignment of the four bands through this auction, TCRA has facilitated the deployment of communications resources key in the implementation of national programmes and strategies towards the digital economy in Tanzania.

The auction was part of the TCRA's mandate to plan, manage and monitor the radio spectrum in Tanzania. Spectrum management includes identifying available bands and re-farming spectrum to meet licensees' demands and for new services. This is a continuous TCRA function.

The 11 October 2022 spectrum auction was another first for Tanzania and has once again put the country ahead of others in the East African Community(EAC) and SADC sub-regions in proactive communications regulation.

Tanzania was the first country in the Eastern and Southern Africa region to introduce the technology and service neutral converged licencing framework (CLF) in 2005; which has led to an exponential increase in communications service providers, types of services and consumers.

Tanzania was also the first to migrate to digital terrestrial broadcasting in 2014, the first to introduce an address and postcode system, the pioneer of telecommunications traffic monitoring and has now shown the way in the spectrum auction.

Why Spectrum is regulated



Excerpts from the ITU/ World Bank Telecommunications Regulation Handbook

Spectrum management is an extremely important part of telecommunications policy and regulation. The spectrum is allocated for particular uses, and specific technical and service rules, developed by spectrum managers, govern those allocations. As a result, technical and service rules are crucial determinants of the structure and performance of the industry and of institutions devoted to ensuring public safety, security and national defence.

The radio spectrum is used for a plethora of economic, social, cultural, scientific and developmental purposes with an enormous number of end-user services: communications for firms, households and public bodies, including critical safety and security communications used by defence forces, emergency services and air traffic control; various kinds of radar; broadcasting; scientific research; and so on.

From an economic viewpoint, the spectrum is a resource used by a wide range of entities, including public bodies such as defence or emergency services, and for several applications, including narrow and broadband.

The radio spectrum is the portion of the electromagnetic spectrum that carries radio waves. The boundaries of the radio spectrum are defined by the frequencies of the transmitted signals and are usually considered to range from 9 kHz (kilohertz; thousand cycles per second) to 3000 GHz (gigahertz; billion cycles per second).

The key characteristics of the spectrum are the propagation features and the amount of information which signals can carry. In general, signals sent using higher frequencies reach shorter distances but have a higher information-carrying capacity.

These physical characteristics of the spectrum limit the currently identified range of applications for which any particular frequency band is suitable.

The spectrum as an economic resource is unusual in that it is both non-exhaustible and non-storable.

Unlike oil and water, the spectrum will never run out, although it may become increasingly congested. Also, it cannot be accumulated for later use. These factors put a premium on a streamlined process for making spectrum available for purposes which are useful to society. Since spectrum has so many uses, arbitrating among them in cases of shortage can be difficult.

Effective spectrum management can make a big difference in a country's prosperity,

Table1: Examples of Radio Frequency Propagation and Related Services

Frequency	Range	Use	Bandwidth
3-30 kHz	1000's km	Long range radio-navigation	Very narrow
30-300 kHz	1000's km	Same as VLF strategic communications	Very narrow
3-3 MHz	2-3000 km	Same as VLF strategic communications	Moderate
3-30 MHz	up to 1000 km	Global broadcast and Point to Point	Wide
30-300 MHz	2-300 km	Broadcast, PCS, Mobile, WAN	Very Wide
.3-3 GHz	Less than 100 km	Broadcast, PCS, Mobile, WAN	Very wide
3-30 GHz	Varies: 30 km to 2000 km	Broadcast, PCS, Mobile, WAN, Satellite	Very Wide up to 1 GHz.
30-300 GHz	Varies 20 km to 2000 km	Microcell, Point to Point, PCS and Satellite	Very Wide up to 10 GHz.

Key to abbreviations: VLF -Very Low Frequency; LF - Low Frequency; MF - Medium Frequency; HF -High Frequency; VHF -Very High Frequency; UHF -Ultra High Frequency; SHF – Super High Frequency; EHF -Extremely High Frequency; WAN - Wide area network. A system of computer networks connected over a large area via telephone lines and radio waves.

There are four main areas of work in spectrum management: planning, engineering, authorization and monitoring. These are briefly described below:

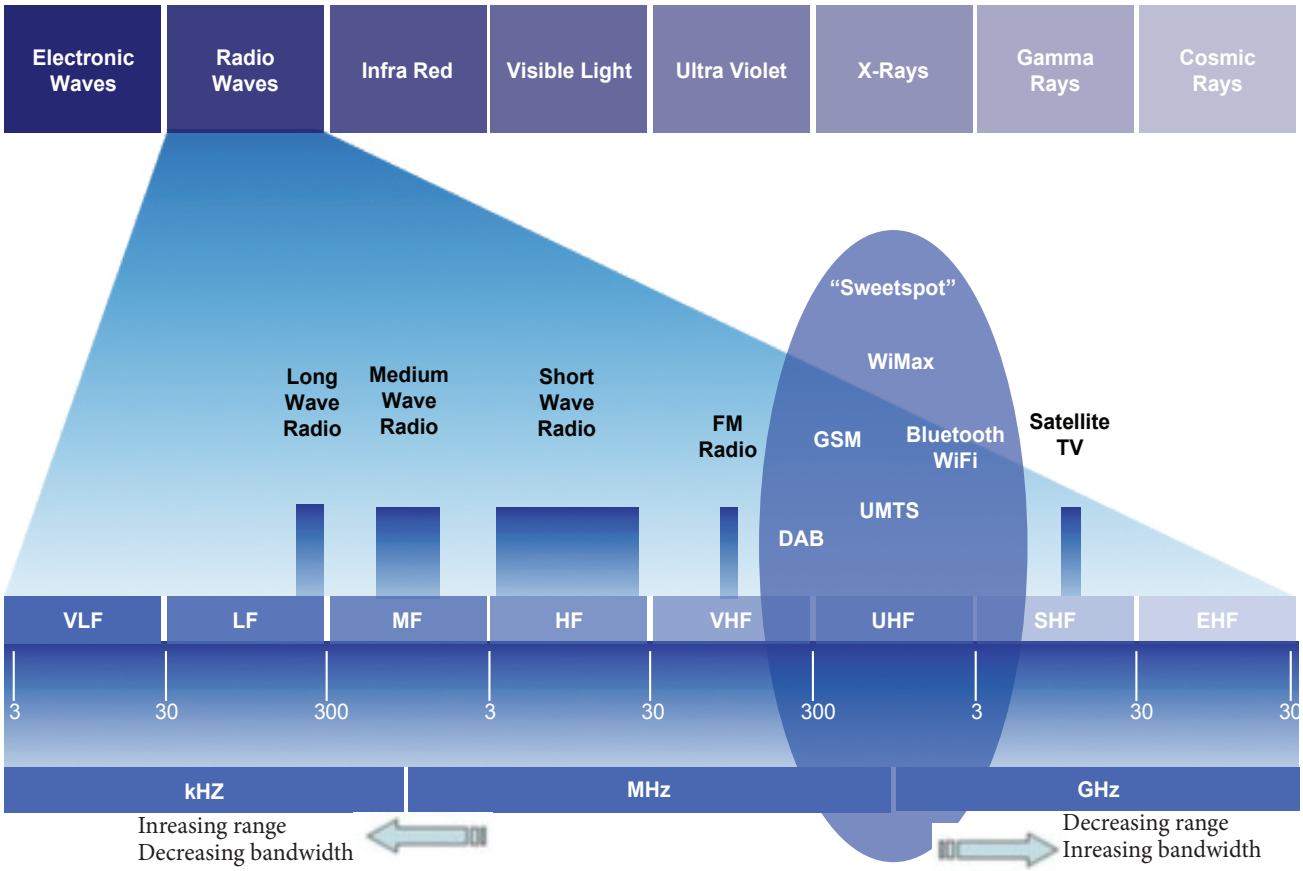
1. Spectrum planning involves the allocation of portions of the frequency spectrum to specified uses under international agreements, technical characteristics and potential use of different parts of the spectrum, and national priorities and policies.
2. Spectrum authorization involves granting access under certain specified conditions to the spectrum resource by various types of radio communication equipment and the certification of radio operators.
3. Spectrum engineering involves the development of electromagnetic compatibility standards for equipment that emits or is susceptible to radio frequencies.
4. Spectrum monitoring and compliance involve the monitoring of the use of the radio spectrum and the implementation of measures to control unauthorized use.

The governance of spectrum use on a global basis is a core responsibility of the International Telecommunication Union (ITU) and, in particular, its Radiocommunication Sector (ITU-R).

The mission of ITU-R is, inter alia, to ensure rational, equitable, efficient and economic use of the radio frequency spectrum by all radio communication services, including those using satellite orbits, and to carry out studies and adopt recommendations on radio communication matters.

Figure 1:

The Radio Spectrum and its Use



VLF	Very Low Frequency
LF	Low Frequency
MF	Medium Frequency

HF	High Frequency
VHF	Very High Frequency
UHF	Ultra High Frequency

SHF	Super High Frequency
EHF	Extremy High Frequency

The ITU is a specialized agency of the United Nations. It is not a global authority in the manner of a national regulator, since the international rules are written by those governed by them, i.e. the Member States of the ITU.

Some spectrum, especially for short-range use (wireless -local area network - LAN, radio frequency identification devices, microwave ovens, various remote control devices, wireless security systems) need not be licensed at all, either because users seldom interfere with one another or because new technologies can be used which are capable of dealing with interference as it happens.

Unlicensed spectrum was initially of little interest, but in recent years it has been debated more widely. This has been made possible by several technological developments.

Spectrum resource planning ensures the efficient and effective use of the spectrum resource. Spectrum regulators need to make decisions about the uses of the spectrum and who should be allowed to use it (i.e. uses and users). Planning is usually undertaken for long-term, medium-term and short-term timeframes.

Forecasting future spectrum use is critically important if future spectrum needs are to be met.

The challenge of forecasting spectrum can be overcome by employing various techniques including projections based on historical growth; and through monitoring of new technologies and noting their spectrum requirements. It is critically important to consult with spectrum users for they are usually in the best position to forecast growth in their sector.

Spectrum use standards state the minimal technical requirements for the efficient use of a specified frequency band or bands. Furthermore, spectrum-use standards can be designed to match ITU-R Recommendations.

Radio equipment standards are used by the regulator in the license approval process, as well as in testing and certification of radio equipment such as transmitters, receivers and antennas to determine compliance with radio or manufacturer specifications.

Radio equipment standards state the limits (if at all) on how certain radio equipment may interfere with other equipment in either shared or adjacent frequency assignments and form the basis for certification and testing. Equipment is said to be certified when it complies with the applicable standards of the country.

If an auction method is used to make an assignment, the procedures to be employed must be set out in fine detail to ensure that all competitors are on an equal footing. For example, if a sealed bid is employed, the date and place at which it must be lodged have to be clear.

In all cases, the regulatory body must abide strictly by the conditions it has specified for the assignment. Any departure or evidence of partiality, prejudice or of conflict of interest will be damaging in several ways. First, legal challenges can delay the start of services of benefit to end users, possibly for many years.

Second, doubts about the integrity of the process will deter companies from participating in competitive assignment processes. As a result, inferior candidates may be successful, leading to long-term harm to consumers.

Auctions are essentially a method of assigning spectrum at the time of its first issue by the spectrum regulator to those who value the spectrum most highly. It is normal for bids to be made in monetary terms, where the competitor offering the largest sum wins the license.

The key differences between auctions and comparative hearings or administrative decisions are that:

1. An auction assigns the license to the firm which bids the most, and that may in certain conditions be the most efficient firm;
2. A competitive auction will, if it operates properly, direct any excess profits from providing the service to go to the government rather than the operator, as would be the case if the operator were chosen via a competitive hearing.

A successful auction requires a clear understanding by participants of what rights and obligations are available to the winner or will be imposed upon them.

Wider scope as Licensing framework fine-tuned

TANZANIA'S communications licencing framework has been consolidated, with several subcategories created under the four main licence types, according to the amended sector regulations.

Application and Content service licences categories now have four sub-licences each. There are provisions for electronic commerce, educational radios and televisions. Licence fees and duration are shown in the respective tables.

The Tanzania Communications Regulatory Authority introduced the converged licencing framework (CLF) in 2005, with network facilities, network services, application services and content services categories.

Network facilities licences authorize service providers to construct, maintain and own facilities such as satellite earth stations, broadband fibre optic cables, telecommunications lines and exchanges, radio communications transmission equipment, mobile communications base stations and broadcasting transmission towers and equipment.

Network services are for using network facilities to provide services. A service provider may use their own or others' facilities. Application services include data and content-based services.

Content licences are for broadcasting. TCRA introduced a new licence for online content services in 2018.

Licence types, categories and subcategories in the consolidated framework are for Network Facilities; Network services; Application services with and without network facilities, with numbers only and electronic commerce.

Content service licenses have subcategories for free-to-air radio and television broadcasting, online content services, authority to broadcast, channel aggregation for cable and special radio and television content for education.

Radio frequency spectrum usage licences have subcategories of radio communication station licences fees, radio frequency spectrum user charges, radio spectrum fees for broadcasting networks and VSAT (satellite dishes) licences.

The other fees are for numbering, type approval, numbering and change of name and shareholding structure.

The Postal and courier licence category has six subcategories, namely: - Public Postal Services and International, East Africa, Domestic, Intra-city and Intercity Courier services.



A young innovator presents her project to TCRA Director General Dr. Jabiri Kuwe Bakari (centre) and the Executive Secretary of the Universal Communications Services Access Fund (UCSAF), Ms. Justina Mashiba at a recent exhibition of ICT talents. TCRA coordinates the International Girls in ICT Day in Tanzania, marked every fourth Thursday of April. The day was conceived by the International Telecommunication Union (ITU) to encourage greater female enrolment in Science, Technology, Engineering and Mathematics (STEM), and to raise awareness about education opportunities for women and girls to change gender perspectives on women and technology.

1. Network facilities.

Table 1: Network facilities. Licence type: Individual. USD=United States dollars

Market segment	Type of facility	Application Fee (USD)	Initial Licence fee (USD)	Renewal Fee (USD	Royalty Fee (Gross Annual Turnover i.e. "GAT")	Licence duration (years
International	Gateway facilities such as Earth Satellite Station, VSAT, Submarine cable, Switching Centres, Nodes and Servers, Multiplexer and others.	10,000		200,000	1% of GAT	25
National	Public Data Centre Facilities for data storage, Hosting, Cloud Computing, data analytics and algorithm, existing as of the date of the publication of these Regulations.					
	Tier 1 Public Data Centre	5,000	10,000	10,000	1% of GAT	25
	Tier 2 Public Data Centre	5,000	15,000	15,000	1% of GAT	25
	Tier 3 Public Data Centre	5,000	25,000	25,000	1% of GAT	25
	Tier 4 Public Data Centre	5,000	30,000	30,000	1% of GAT	25
National	Submarine Cable Landing Station	10,000		300,000	Not Applica- ble	15
National	Switching, transmissions and access facilities such as VSAT; Microwave links; Fixed links, Switching Centres, Laid cables; Fibre Optic, Ex- change, Nodes, Servers, Towers, Ducts, Transmitters and Links, Multiplexer and others	10,000		300,000	1% of GAT	25
Regional		1,000	10,000	17,250	1% of GAT or USD 2,500 whichever is greater	
District		100	3,000	3,450	1% of GAT or USD 1,000, whichever is greater	



2. Network services						
Table 2: Network services. Licence type: Individual. USD=United States dollars						
Market segment	Type of service	Application Fee (USD)	Initial Licence fee (USD)	Renewal Fee (USD	Royalty Fee (Gross Annual Turnover i.e. "GAT")	Licence duration (years
International	A) Electronic communications network operations with the following features: 1) Network access codes 2) Interconnection capabilities B) Virtual Electronic Communication Services	10,000	300,000	400,000	1% of GAT	25
National		5,000	600,000	750,000	1% of GAT	
Regional		2,000	23,100	26,500	1% of GAT	10
District		100	5,000	5,750	1% of GAT	

3. Application services						
Table 3: Application services. Licence type: Individual. Sub-category A: With Network Facilities and Network Services licences.						
Market Segments	Type of Service	Application Fee (US $)	Initial Licence Fee (US $)	Renewal Fee (US $)	Annual Fee (US	Licence duration (years)
International	To provide international connectivity/bandwidth whether by satellite or submarine or other technologies	5,000	100,000	120,000	1% of GAT	25
National	To provide to the public voice, message, Inter- net services, Internet Telephony (VoIP), pay	10,000	10,000	13,500	1% of GAT	
Regional		1,000	1,150	1,150	1% of	10

Table 4: Sub-category B: Without Network Facilities and Network Service licences							
Market Segments	Type of Service	Applica-tion Fee (US$)	Initial Licence Fee (US$)	Renewal Fee (US	Annual Fee (US)/ Royalty	Licence duration (years)	Type of licence
International	To provide interna-tional connectivity / bandwidth whether by satellite or submarine or other technologies	5,000	100,000	115,000	1% of GAT	10	Individual
National	To provide Internet services, pay phone, internet Telephony (VoIP) Data services, Tracking services, financial services, gaming services, virtual applications services, virtual application and any other related services.	1,000	10,000	11,500	1% of GAT	5	Individual
Regional		200	1,000	1,150	1% of GAT		Individual
District		50	200	230	1% of GAT		Individual
National (Private)	Closed User Group						Class

Table 5: Sub-category C: Application Service licence with numbers only							
Market Segments	Type of Service	Application Fee (US$)	Initial Licence Fee (US$)	Renewal Fee (US	Annual Fee (US)/ Royalty	Licence duration (years)	Type of licence
National	Value added Services using numbers only	50	500	500	500	3	Class

Table 6: Sub-category D: Application Service (e-commerce) licence							
Market Segments	Type of Service	Application Fee (US$)	Initial Licence Fee (US$)	Renewal Fee (US	Annual Fee (US)/ Royalty	Licence duration (years)	Type of licence
National	Application Services	50	500	500	500	3	Class
(e-Commerce)	50,000	200,000	200,000	200,000	3	Class	

4. Installation and Maintenance, Importation and Distribution of electronic communication equipment

Table 7: Installation and Maintenance, Importation and Distribution of electronic communication equipment					
Type of Licence/ Authorization	Market Segment	Application Fee	Renewal Fee	Annual licence Fee	Licence Duration
		(Tshs)	(Tshs)	(Tshs)	Years
Installation and Maintenance	Class A	100,000	100,000	2,300,000	3
	Class B	50.000	50.000	200,000	3
Importation	National	50.000	50.000	2,300,000	3
Distribution (wholesalers)	National	50,000	50,000	1,500,000	3

5. Content services

Table 8: Sub category 5A: Content Broadcasting (Free to Air)								
Licence Category	Market segment	Application fees (Tshs)	Construction Permit fees (Tshs)	Initial Licence Fees (Tshs)	Renewal Licence Fees (Tshs)	Annual Fees (Tshs)	Licence duration (years)	Class of Licence
(I) Radio Broadcasting (Free to Air)								
Public	National	NA		NA		NA	NA	Individual
Private	National	3,200,000	200,000	25,000,000	4,800,000	25,000,000	5	Individual
	Regional	1,600,000	200,000	15,000,000	3,200,000	15,000,000	5	Individual
	District	1,600,000	200,000	3,200,000	2,400,000	3,200,000	5	Individual
Community	Community		200,000	1,100,000	800,000	1,100,000	3	Class
(II) Television Broadcasting (Free to Air))								
Public	National	NA		NA		NA	NA	Individual
	National	8,000,000		32,000,000	9,600.000		5	Individual
	District	3,200,000		6,400,000	2,400,000		5	Individual
	Community	1,600,000		1,600,000	1,600,000		3	Class

Table 9: Sub category 5B: Content broadcasting (Authority to broadcast)							
Licence Category	Market segment	Application fees (Tshs)	Initial Li-cence Fees (Tshs)	Renewal Fees (Tshs)	Annual Fees (Tshs)	Licence duration (years)	Class of Licence
Channel aggregators(Network Facility Licensee and Multiplex)	National	16,000,000	160,000,00	160,000,000	1% of GAT	10	Individual
Channel Aggregator (cable)	National ****	1,600,000	2,400, 000	2,400,000	4,000,00 0	3	Class
	Regional***	300,000	1,600,000	1,600,000	1,600,00 0	3	Class
	District**	100,000	400,000	400,000	800,000	3	Class
Content Services by Subscription (For Aggregation)	National	1,000,000	5,000,000	1,000,000	5,000,00 0	3	Class
	Regional	160,000	800,000	800,000	1,600,00 0	3	Class
	District	80,000	500,000	500,000	800,000	3	Class
Support Services (Satellite)	National	2,000,000	230,000,000	264,500,000	1% of GAT	3	Individual
Channel Aggregator (Cable) District Aggregator** Refers to subscribers from 10 to 1000 Regional Aggregator*** Refers to subscribers from 1001 to 5000 National Aggregator **** Refers to subscribers from 5001 and above.							

Table 10: Sub category 5C(a): Special Content (Educational) Television							
Market segment	Application fees (Tshs)	Construction Permit fees (Tshs)	Initial Li-cence Fees (Tshs)	Renewal Fees (Tshs)	Annual Fees (Tshs)	Licence duration (years)	Class of licence
National	500,000	200,000	1, 000, 000	500, 000	1,000,000	3	Class
Regional	500, 000	200, 000	800,000	500, 000	800, 000	3	Class



Table 11: Sub category 5(b): Special Content (Educational) Radio							
Market segment	Application fees (Tshs)	Construction Permit fees (Tshs)	Initial Licence Fees (Tshs)	Renewal Fees (Tshs)	Annual Fees (Tshs)	Licence duration (years)	Class of licence
National	500,000	200,000	800,000	800,000	500,000	3	Class
Regional	500,000	200,000	500,000	800,000	500,000	3	Class

6. Radio Spectrum Usage licences

Table 12: Sub category 6 A: Radio Communication Station licences and fees					
S/N.	Types of Station Licence	Application fees (US $)	Annual Licence fee/station/ bandwidth (US $)	Renewal fee (US$)	Licence duration (years)
1	(a) Amateur radio station	10	20	10	3
2	(b) Amateur experimental station	10	10	10	3
3	(c) Amateur Novas Station	10	10	10	3
4	Ship Station*	25	500	25	3
5	Aircraft Station*	25	500	25	3
6	HF Fixed/Mobile Radio Station	10	120	10	3
7	VHF/UHF Fixed/ Mobile/Portable Radio Station with Single Frequency	10	70	10	3
8	VHF/UHF Fixed/ Mobile/Portable Radio Station with pair of Frequencies	10	80	10	3
9	VHF/UHF Radio Repeater	10	100	10	3
10	HF Cross Boarder Station	10	120	10	3
11	Wireless Data Radio Links/Repeater Radio Station	10	70	10	3
12	Global Maritime Distress and Safety System - GMDSS**	15		15	3
13	NB: * Fees charged as one station ** Fees charged in respect of certificate				

Table 13: Sub-category 6 B: Radio Frequency Spectrum user charges				
S/N.	Types of Station licence	Annual Licence fee/station/ Bandwidth (US $)		Licence duration (years)
1	Transmission /Base station Charges	Repeaters/BTS/ Transmission Links	70 per station for first 3000 stations	10
			35 per station for more than 3000 stations	

2	Frequency Bandwidth/ Channel Charges	Band A 450MHz, 700MHz, 800MHz, 900 MHz, 1800MHz, 2100MHz	30,000 per 1MHz bandwidth	10
3		Band B 2300MHz, 2500MHz, 2000MHz	10,000 per 1MHz bandwidth	10
4		Band C 1850MHz, 1900MHz, 3.1, 3.3, 3.5, 4.0, 4.9, 5.2, 5.4, 5.7, 5.8 GHz	5,000 per 1MHz bandwidth	10
5		Band D Microwave Links (Long haul): 5, 6, 7, 8, 10, 11GHz	1,000 per 1MHz bandwidth	10
6		Band E Microwave Links (Short - haul): 13, 15, 18, 23GHz	750 per 1MHz bandwidth	10
7		Band F Microwave Links/ Access: 28, 32, 38 GHz	350 per 1MHz bandwidth	10

Table 14: Sub-category 6C: Radio Spectrum fees for Broadcasting Networks

S/N.	Licence	Areas	Amount (Tshs)	Licence duration (years)
1	FM Radio Broadcasting Transmitter (National) per transmitter	Cities	2,300,000	5
		Regional Towns	1,610,000	5
		District and Administrative Towns	1,150,000	5
		Rural Towns and Underserved	460,000	5
2	Studio to Transmitter Link (Radio Broadcasting)	Cities	160,000	5
		Regional Towns	160,000	5
		District towns	80,000	5
3	DTT Transmitter per channel for subscription services	Main Cities	1,150,000	5
		District and Administrative Towns	690,000	5
		Rural Towns and Underserved	276,000	5
4	DTT Transmitter per channel for FTA services	National/regional/district	Exempted	5
5	VHF/UHF digital Television transmitters- gap fillers transmitters Applicable to multi- plex operators)	National/regional/district	100,000	5

Table 15: Sub-category 6 D: V-SAT licences

S/N.	Licence	Application Fees (US$)	Licence renewal Fees (US$)	Annual Fees (US$)	Licence duration (years)
1	Fixed VSAT Terminal	10	10	50	3
2	Mobile VSAT Terminal (transportable Satellite transceivers /SNG/ESIM	10	10	70	3
3	Registration for Satellite Mobile Phones	100	10	Exempted	3
4	Satellite Ground Earth Station	10	10	5,000	3

7. Numbering Fees					
Table 16: Numbering Fees					
S/N.	Type of Numbering Resource	Application Fees (US $)	Registration Fees (US $)	Annual Maintenance Fees (US $) (payable one year after registration)	Licence duration (years)
1	Prefix for Networks (NDC & MNDC)	10	2,000	2,000	1
2	Subscriber Numbers	NA	NA	US$ 0.20 per Subscriber Number	
3	National Signaling Point Codes (SPC)	10	2,000	2,000	1
4	International Signaling Point Codes (ISPC)	10	2,000	2,000	1
5	Mobile Network Identification Codes (MNIC)	10	2,000	2,000	1
6	SIM Header	10	2,000	2,000	1
7	Data Network Identification Codes (DNIC)	10	2,000	2,000	1
8	Corporate Services Network Access Numbers	10	2,000	2,000	1
9	Carrier Selection/ Pre-selection Codes	10	10,000	5,000	1
10	Premium Rate Access Codes (block)	10	2,000	5,000	1
11	Special & Fixed Rate Access Codes (block)	10	2,000	5,000	1
12	Special & Fixed Rate Access Codes Premium Rate Access Codes (Single Number)	10	1,000	2,000	1
13	USSD Short Codes	10	2,000	2,500	1
14	VAS SMS & Special Services Short Codes:				
15	(a) Gold	10	4,000	2,500	1
16	(b) Silver	10	3,000	2,500	1
17	(c) Bronze	10	2,000	2,500	1
18	(d) Ordinary	10	1,500	2,500	1

8.Postal and Courier Services					
Licence Categories	Application Fee (Tshs)	Initial Licence Fee (Tshs)	Licence Renewal Fee (Tshs)	Annual Fee (Tshs)	Licence duration (years)
Public Postal Licensee	2,300,000	20,000,000	20,000,000	20,000,000	25
International Courier	170,000	18,000,000	170,000	18,000,000	5
East Africa Courier	100,000	6,000,000	100,0000	6,000,000	3

Domestic Courier	60,000	3,000,000	60,000	3,000,000	3
Intra-City Courier	60,000	1,400,000	60,000	1,400,000	3
Inter-City Transporters	60,000	400,000	60,000	400,000	3

9. Equipment type approval

Table 18: Equipment type approval fees (in US dollars)

Type of equipment	Application	Approval
Electronic Communications Terminal Equipment		
Telephone Sets, Data Modems, Mobile Phones, VHF/UHF Radio, Wireless Modules, Land Mobile Cellular, Non-manageable switches, Personal Computers, Short Range Devices (SRDs) Smart TV, Digital Radio, Set-Top-Boxes (STBs), VSAT, etc.	10	10
Office Communications Systems (PABX)		
Up to 50 Extensions	10.00	100.00
51 extensions and above	10.00	300.00
Electronic Communications Network Equipment		
Base Stations, Microwave Radios, Active Antenna with Radio Unit etc.	10	1,000
Core Network Switching Equipment	10	1,000
Broadcasting Transmitters, STL Radio	10	50

10. Change of Name and Shareholding Structure			
Table 19: Change of Name and Shareholding Structure			
S/N.	Issue	Type of licence	Change fees (US $)
1	Application for Change of Name	(a) Network Facilities, Network Services, and Application Services	1,000
		(b) Content Services	200
		(c) Other Licences	200
2	Application for Change of Shareholding Structure	a) Network Facilities, Network Services, and Application Services	1,500
		(b) Content Services	500
		(b) Content Services	200

TZ-CERT

TANZANIA COMPUTER EMERGENCY RESPONSE TEAM

Coordinating Online Safety

The Tanzania Computer Emergency Response Team (TZ-CERT) is a team responsible for coordinating responses to cyber security incidents at the national level. It cooperates with regional and international bodies involved in the management of cyber security incidents.

TZ-CERT was established under section 124 of the Electronic and Postal Communications Act (EPOCA) of 2010 and within the TCRA structure.

Our Vision: To be a globally trusted hub for handling cyber security incidents.

Our Mission: To improve and support the nation's cyber security posture, coordinate information sharing, and proactively manage cyber risk while enhancing the commitments of constituencies.

Our Objective: To ensure a high and effective level of network and information security within Tanzania and to develop a culture of network and information security for the benefit of the entire community (government, citizens, consumers, enterprises and public sector organizations); thus contributing to a smooth and safer functioning of on-line activities.

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