OPTIONS AND FACTORS
FOR CONSIDERATION

On Special Spectrum Release or System Authorization in Fight of COVID-19 and its Impact Mitigation

ATU-R Recommendation 006-0

May 2020

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PART A: PREAMBLE

1. The African Telecommunications Union (ATU) is a specialised institution (SI) of the African Union (AU) in the field of telecommunications and ICTs. As an SI, ATU executes tasks assigned to it by the AU from-time-to-time.

2. An extra-ordinary meeting of the AU Bureau of the Specialized Technical Committee on Communication and ICT (STC-CICT) was held on 5th May 2020 to "*consider strategies and actions to support the continental strategy on COVID-19 pandemic*". The meeting took place by videoconference. The STC-CICT Bureau comprises Ministers in charge of Communication and ICTs from Africa.

3. As part of the strategies and actions to support the continental strategy on COVID-19 pandemic, the said meeting approved an Action Plan on ICT Sector COVID 19 Response in which one of the short term action items is "*empower Member States with options on how the radio spectrum bandwidth can be exceptionally released to (and used by) Member States' operators to enhance mobile broadband connectivity during the crisis in order to meet the increased demand.*"

4. This paper is pursuant to the above stated short term action item and provides possible options and factors for consideration on special spectrum release or system authorization in the Fight against COVID-19 and the Mitigation of its Impact.

PART B: CONTEXT AND OBJECTIVES

1. As part of the measures to curtail the spread of COVID-19, many governments across Africa have instituted stay-at-home orders and/or advisories albeit in varying degrees. Since the commencement of these measures, internet and data traffic usage has significantly changed both in terms of geographical distribution and volumes. With stay-at-home orders, much of the traffic has since moved from the usual work-place/office and educational areas into residential areas. In addition, some networks have experienced significant traffic increases of up to 50% [**The New Stack**] (see https://thenewstack.io/the-network-impact-of-the-global-covid-19-pandemic/)

2. The above development has placed constraints on network segments serving residential areas, primarily in urban and peri-urban areas, as the new traffic volumes were not originally planned for. This has negatively impacted the provision of education, work, etc, as the networks can no longer meet the new traffic demands – some users have ended up not being able to effectively carry out learning and work.

3. The COVID-19 crisis has brought to the fore the long-standing issue of the digital-divide between the urban and rural Africa. In order to address this divide and to ensure rural populations have access the essential services, notably e-learning, governments are looking to improving rural connectivity including the deployment of novel HAPS systems. The case of Kenya and Mozambique are good examples of this.

4. In order to meet the new traffic demand and usage, some operators have had to request for special spectrum release (use authorization from country spectrum administrators) in an attempt to address the new demands. Indeed, these operators have used the special spectrum releases to specifically enhance the capacity of their networks in residential areas (where user demand has shifted to since stay-at-home orders/advisories). In some cases, it has been governments[1] taking a proactive step of ensuring citizens have enough connectivity by way of authorising new forms of connectivity such as HAPS based systems.

5. Whereas some countries have gone ahead to release spectrum on special arrangements as highlighted above, it may be the case that some countries are considering or may, in the future, consider such special release arrangements. In order to assist these countries, options have developed so as to provide a starting point. It is expected that countries would use these options to *explore, evaluate and decide* on the best approach for their country – the best approach may as well be a combination of the merits of two or more options or indeed an entirely new option – including the procedures and funding the needed cost to evacuate the required spectrum from its current users in addition to fulfilling all necessary measures relevant to the national security. The bottom line of the options is to aid countries take an informed decision. These options do not seek to diminish the sovereign right of countries to take decisions they deem appropriate for their countries. In other words, the options are advisory and not instructive to Administrations.

6. The suggested options are mostly complementary, for example, Options 3 (HAPS), 5 (TVWS) and 6 (Wi-Fi) should be considered whilst taking cognisance of the fact that a robust fixed and/or mobile network should exist to adequately cater for and carry the traffic that these options would create.

7. Much of the spectrum identified for IMT remains unused for broadband services in most countries. There are various reasons for this, including lack of demand and policy/regulatory provisions or lack thereof LS telcom (https://www.esoa.net/cms-data /positions/2019_Study_LicensingUseofMobileSpectrum_1.pdf). Therefore, it is hoped that during this period of the COVID-19 crisis, the unused spectrum could be released to operators on temporary basis or otherwise, in particular existing operators, for faster relief/impact.

8. The options cover both terrestrial and satellite based systems including the emerging HAPS (High Altitude Platform Station) and ESIMs (Earth Station In Motion) systems.

9. Apart from decongesting the networks and/or improving the traffic volumes, making more spectrum available and affordable lowers costs for operators, increases efficiency, and generally can enable lower costs for consumer mobile broadband prices (though

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[1] A good example here is that of the Government of Kenya authorizing LOON operation in Kenya.

other factors will also be involved). The element of affordable price is particularly crucial during the crisis period as many people have diminished incomes. Further, zero or nominal spectrum fees encourages operators to deploy additional infrastructure, including in rural and remote areas.

10. The COVID-19 pandemic has highlighted the extent of the digital gap in our society, underscoring the importance of connecting everybody and ensuring that no individuals or communities are left behind. Those who are unable to work, learn via e-learning, or continue running businesses are facing a digital divide where coverage and quality of services are not sufficient to support their continued participation in the economy and education. The digitalization of industries across the economy will not only help African countries to recover from the disruptions faced today, but also prepare them to better face future challenges. For these reasons, it is important that, as early as now, national regulators and policymakers should start developing proactive schedules to accelerate the implementation of national broadband plans and digitalization strategies. The main goal should be not only to help to address the current situation, but to accelerate economic recovery in the post-pandemic period and to be better prepared to deal with a similar situation in the future.

PART C: FACTORS FOR CONSIDERATION

In considering the *Options* stated hereunder (Part D), other practices elsewhere in Africa and the world, or indeed a totally new approach, it is advisable to take into account the following factors:

1. *Stakeholder views* – it is essential that in the evaluation of the options, stakeholder views are sought and taken into account. One key stakeholder category is the Operators themselves – it is particularly important to consult the views of the operators on a number of issues including:

    a. Infrastructure equipment availability; and ability to enhance existing equipment through software/hardware upgrades,

    b. The hardware or software requirements that would be needed to make use of additional spectrum - this information would have implications on timelines for utilization of the spectrum (e.g. if existing Remote Radio Unit (RRU) cannot support that spectrum).

    c. The extent to which spectrum use efficiency could be enhanced, and hence network capacity gains, by allowing technology neutrality.

    d. What spectrum bands and respective amounts would be most suitable, and the mechanism for the quickest mode of its release - ideally

first-come-first-served or "beauty contest" mechanism dependent on the foreseen spectrum demand by the operators.

e. Encourage permitting technology neutral implementations of spectrum utilizations.

f. The mechanisms for the most flexible/optimum usage of the mobile bands when mobile networks loading in residential areas increase significantly, including for example, (1) the use of unused or underused mobile bands on a temporary basis in the areas of increased demand for connectivity; (2) soft re-farming (*Part D Option 4 refers*) and (3) spectrum sharing.

g. Ways in which the role of Wi-Fi could be enhanced - as the final link between people's routers and the increasing number of wireless-enabled electronics devices, it is essential that Wi-Fi does not became a bottleneck as connections grow and traffic increase.

h. What constitutes the crisis period and the determination thereof and hence what constitutes the post-crisis period and hence the determination thereof.

2. ***User devices availability*** – it is futile to release spectrum for operating a network for which the users cannot access due to lack of user devices.

3. ***Accessibility of the masses to essential information and/or services:*** the operators' willingness/capacity to offer free or affordable bundles for consumers for designated educational and medical websites and/or information portals.

4. ***Creation and implementation of an enabling regulatory environment*** – it is critical that the temporary release of spectrum be accompanied by efforts to ensure an *enabling regulatory environment.* To maximize the value of the released spectrum, and accelerate the pace of additional services/broadband deployment administrations are encouraged to consider additional enabling policy interventions such as by among other things:

a. Introduction of and/or adherence to technology neutrality for all mobile spectrum bands;

b. Introduction of and/or adherence to blanket licencing for user terminals, in particular for satellite based services;

c. Fast-tracked import, type approvals, infrastructure deployment and right-of-way permits; release of numbering and IP resources (if so required), energy provisioning;

d. Waiver of value added tax (VAT) and customs duties on network equipment, as well as reduction of other further taxes (e.g. municipal taxes) for equipment destined for rural areas to encourage operators to venture into less lucrative underserved and unserved areas of the country in order to achieve the goal of information for all;

e. Establishment of a one-stop-shop licensing/authorizations mechanism to fast track approvals;

f. Enhancing the role of Wi-Fi as the final link between people's routers and the increasing number of wireless-enabled electronics devices.

g. Establishment and/or enforcement of infrastructure sharing (notably backhaul and backbone infrastructure e.g. microwave links, fiber links, etc) which has the positive effect of promoting rapid deployment and driving down the user prices.

h. Establishment and/or enforcement of national roaming – this is especially crucial in rural areas wherein coverage of some operators could be lacking.

i. Promotion of universal connectivity and service – this could be done by among other things, effective collection and utilization of universal service funds, as well as, expedited release of the Digital Dividend spectrum to operators. The Digital Dividend spectrum has better coverage properties and is therefore key to fostering universal connectivity particularly in rural areas.

These above outlined aspects are crucial in ensuring expedited (broadband) infrastructure deployment and hence optimised utilization of the recently released spectrum resulting in an effective crisis impact mitigation as intended.

5. *Inclusivity and open-mindedness* – navigating the Covid-19 crisis requires an effort to leverage and utilize all existing and emerging technologies based on the individual merits of the technologies. As such, administrations are invited to consider the spectrum needs of all services alike in an inclusive and open-minded manner.

6. *Protection of existing services* – new or temporary spectrum releases should not compromise commitments to protect existing services and incumbents.

7. *Harmonization and standardization implications* – the spectrum releases/assignments should support and uphold the principles of harmonization and standardization.

8. *Business case for continued support of affordable broadband* – the principle of supporting cost effective deployment and allowing a reasonable cost recovery time will foster affordable service prices to consumers.

9. ***Ability for quick deployment*** – great considerations should also go to the ability to deploy fast and urgently to meet the changing environment.

10. ***Mutually agreed and documented Exit plan*** – what happens to the temporary spectrum post crisis and the network equipment, particularly in the case of new RRU hardware, associated with it should be discussed, agreed and properly documented. These elements should ideally be stipulated in the licence conditions. If not properly documented and managed, post-crisis issues can be a source of conflict/litigation.

11. ***Embarking on the implementation of the medium and long-term action items contained in the "Action Plan on ICT Sector COVID 19 Response" as early as now -*** while the COVID-19 emergency may be prompting immediate spectrum management relief and mitigation response actions, it is advisable that such activities should also focus more broadly than pandemic response. Specifically, the spectrum management activities should be oriented to foster the overall reach, capability, growth and sustainability of the ICT sector including deployment of emerging, innovative technologies (such as 5G, IoT, HAPS, ESIMs, MSS and WiGig), as appropriate. One way the above could be achieved is by proactive spectrum management actions, such as releasing spectrum faster than currently planned and conducting spectrum assignment processes more expeditiously. The overall aim should be to target the promotion of investment, job creation, and economic recovery as we emerge from the current pandemic.

PART D: THE OPTIONS, AND CASE STUDIES (WHERE APPLICABLE)

Option 1 – Release of spectrum to an existing network operator for a defined period of time at no cost

In March 2020, the Ministry of Communications and Digital Technologies of South Africa published the Electronic Communications, Postal and Broadcasting Policy Directions and Regulations under the National Disaster Management Act. After due consideration of the policy directions, in April 2020, the Independent Communications Authority of South Africa (ICASA) published the ICT COVID–19 National Disaster Regulations to release spectrum to **existing** licensees on temporary basis and at no cost "*in order to achieve the objectives of the [South African] Covid-19 regulations, which are aimed at alleviating network challenges, easing congestion and ensuring good quality of service for consumers*". Specifically, it was expected that "*the release of the spectrum would help maintain good-quality broadband services and would enable licensees to lower the cost of access to customers*" as well as alleviate network congestion. **Independent Media and affiliated companies** (https://www.iol.co.za/business-report/economy/icasa-issues-emergency-radio-frequency-46922205) Whereas the temporary licenses were granted at no cost to the operators, they however, come with a few conditions attached - all intended to mitigate the impact of COVID-19:

operators are obliged to facilitate access to remote learning initiatives and virtual classrooms and to not charge their subscribers for access to health-related websites specifically identified by the country's Department of Health. (**Developing Telecoms Ltd**)

(https://www.developingtelecoms.com/telecom-business/telecom-regulation/9450-south-africa-releases-emergency-spectrum-to-service-providers.html)

According to ICASA, the validity of the temporary licences is until the earlier of either three months after the national disaster period has ended or the end of November 2020. The bands covered include the following IMT identified spectrum bands: 700MHz, 800MHz, 2300MHz, 2600MHz and 3500MHz. (**Independent Media and affiliated companies**)

(https://www.iol.co.za/business-report/economy/icasa-issues-emergency-radio-frequency-46922205)

In similar fashion and for similar reasons, the Ghanaian government has given spectrum to MTN and Vodafone for three months at no cost.

At the request of the mobile operators, the Zambia ICT Authority (ZICTA) has released (additional) spectrum to all mobile operators for an initial period of 3 months at no cost. The period could be extended *"subject to the improvement of QoS in this period"*.

It was the operators' initiative to get extra spectrum after they were queried for poor QoS (quality of service). The networks were *"experiencing the worst QoS in this [COVID-19 crisis] period"* as a result of increased traffic on their networks – *"everyone wants to communicate in this crisis period, while those who are working from home are also busy accessing entertainment via internet (mainly Netflix as it is also free in this period)"*.

Based on the above Ghanaian, South African and Zambian cases, *Option 1* therefore would typically entail releasing (additional) spectrum for use by existing operators, for a limited period of time (ideally covering the COVID-19 crisis period as per the country's official emergency period) in order to, among others, alleviate network congestion, increase network capacity and provide access to essential services (e.g. designated educational and medical websites) free of charge for users.

Option 2 – Release of spectrum to existing network operators for a defined period of time, at nominal cost

Option 2 is similar to Option 1 except that here, the spectrum release has a nominal fee attached to it.

In March 2020, the Commission for Communications Regulation of Ireland (ComReg) instituted the "COVID-19: Temporary spectrum management measures". The objective of these measures were to meet the operators request for temporary assignment of spectrum during the Covid-19 crisis.

The initial duration of the temporary licences was set at 3 months and was subject to a further extension of 3 months considering that the COVID-19 crisis termed the "Temporary Situation" was deemed to last 6 months. In case of the Temporary Situation continuing beyond 6 months, ComReg could seek to make further regulations to allow for licensing beyond this period at its own discretion.

As regards applicable licences fees, ComReg determined that "*in light of the [issues raised in Section 3.4.3 of the document], ComReg is of the view that the optimal use of the radio spectrum could be ensured without needing to rely on spectrum usage fees and that a **nominal fee of €100** would be appropriate for Temporary ECS Licence(s)".* (**ComReg**)

(https://www.comreg.ie/publication/covid-19-temporary-spectrum-management-measures)

Based on the above Ireland case, ***Option 2*** therefore would typically entail releasing (additional) spectrum for use by the existing operators for a limited period of time, at a nominal fee. The period should ideally cover the COVID-19 crisis period as per the country's official decisions on the Covid-19 emergency.

Option 3 – Fast-tracking regulatory approvals for emerging connectivity systems (such as High Altitude Platform Station (HAPS) and Mobile Satellite Systems (MSS)) or indeed conventional systems to expeditiously operate in a country – the case of Kenya and Mozambique LOON systems

In March 2020 and as part of a "*measures to respond to the disruptions caused by the global Coronavirus pandemic that has seen many people work from home to avoid contracting the respiratory illness*", the Kenyan government[2] **fast-tracked** regulatory approval for LOON (an emerging HAPS based system) to expeditiously operate in Kenya so as to boost communications capabilities to help fight the spread of the coronavirus as well as mitigate its impact, by among other things, meeting the need for need for "*enhanced connectivity*" particularly in rural and remote areas. LOON will operate in partnership with a local partner, Telkom Kenya and intended to "*foster communication and enable Kenyans to retain and enhance remote access to the Offices and Enterprises"* as well as *"boost online learning as it will allow teachers and students to access education materials remotely"* by ensuring *"universal 4G Data Coverage throughout Kenya*". (**Kenya President's Office**)

(https://www.president.go.ke/2020/03/23/kenya-approves-roll-out-of-google-loon-4g-to-mitigate-coronavirus-work-disruptions/)

In May 2020, the Mozambican authorities (the communications and aviation regulators) gave approval for Vodacom (one of the operators in Mozambique) to launch the LOON HAPS based system. "*Using the Loon solution, Vodacom will expand mobile network access to Cabo Delgado and Niassa, two provinces that have proven hard to cover in the past due to their size, topography and low population density*", Vodacom said on Wednesday 13th May 2020. According to Vodacom Group chief executive Shameel Joosub, "*[the system] is even more pertinent in the face of the COVID-19 pandemic, where more Mozambicans will now have access to healthcare information through our Loon partnership".* (**Reuters**)

(https://www.reuters.com/article/us-mozambique-internet/alphabets-loon-and-s-africas-vodacom-to-expand-rural-internet-in-mozambique-idUSKBN22P1Z1)

Based on the above Kenyan and Mozambican cases, ***Option 3*** therefore would typically entail fast-tracking regulatory approvals for an emerging connectivity systems or indeed conventional systems to expeditiously operate in a country. This option assumes there is an application by an operator(s) for operation of such a system. However, countries are encouraged to consider inviting such applications from potential operators.

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[2] See the Kenya President's Office website article here
(https://www.president.go.ke/2020/03/23/kenya-approves-roll-out-of-google-loon-4g-to-mitigate-coronavirus-work-disruptions/)

Option 4 – Facilitating flexibility in the use of the spectrum already licenced to operators by allowing the operators to dynamically use or share their respective frequency resources depending on the nature of the traffic needs/forecasts

Given the change in traffic mapping between data and voice and the times of the say and geographic areas; the state of occupation of the frequency bands licenced to an operator; and the fairly long deployment time that the opening of new frequency bands could take, the following are proposed as sub-options to be considered;

- the implementation of "soft re-farming" and/or;

- subject to regulatory approval; the implementation of voluntary Spectrum Sharing, Active Infrastructure sharing and National Roaming.

The following example explains the suggested soft re-farming principle: in a given geographic area and at a given time of the day, the operator may decide to use part of its 2G (voice) frequency resources to provide 3G/4G (data services) or vice versa depending on traffic needs/forecasts.

Active infrastructure sharing is sharing of electronic infrastructure of the network including radio access network (consists of antennas/transceivers, base station, backhaul networks and controllers) and core network (servers and core network functionalities). This form can be further classified into MORAN (Multi-Operator Radio Access Network), where radio access networks are shared and dedicated spectrum is used by each sharing operator, MOCN (Multi-Operator Core Network), where radio access networks and spectrum are shared, and core network sharing, where servers and core network functionalities are shared (GSMA). (https://www.gsma.com/futurenetworks/wiki/infrastructure-sharing-an-overview/)

These concepts aid in efficient use of spectrum and network resources and can allow operators to pool their resources for the purposes of improving network capacity and/or roam on each other's networks where feasible, thus improving universal access, and increasing efficiency in spectrum utilisation.

Re-farming necessitates and could be enabled by making the spectrum licences technology neutral in cases where the current spectrum licences are technology specific (e.g. the 900MHz band spectrum being only allowed for 2G systems). Active Infrastructure and Spectrum Sharing could be enabled by directives guidelines/regulations, as appropriate.

This option, *Option 4*, would typically entail authorization of Soft re-farming, National Roaming, Infrastructure Sharing and Spectrum Sharing which involves flexibility in the use of deployed infrastructure and the spectrum already licensed to operators by allowing the operators to dynamically use network equipment and frequency resources depending on the nature of the traffic, and sharing the spectrum in geographical areas where one operator is underutilising some of its spectrum and another operator is in need of such spectrum.

Option 5 – Authorization for deployment of Television White Space (TVWS) solutions that opportunistically utilizes the unused spectrum in the UHF terrestrial television broadcasting spectrum within the range 470 – 694MHz

The UHF spectrum has good coverage capabilities for use in connecting unserved and underserved rural communities. TVWS could be a good solution for connectivity rural schools.

Ghana, Malawi and South Africa are some of the known African countries who have established TVWS regulations for their respective countries. They could be contacted for benchmarking on TWVS, if so required and as appropriate.

This option, **Option 5**, would typically entail authorization for deployment of Television White Space (TVWS) solutions that opportunistically utilizes the unused spectrum in the UHF terrestrial television broadcasting spectrum within the range 470 – 694MHz.

Option 6 – Accelerating the activation of Wi-Fi usage on a licence-exempt basis of bands 5925-6425 MHz and 5725-5850 MHz and Channels 1 to 4 of the WiGig (Gigabit Wi-Fi) bands in the 60GHz band, or parts thereof

The Radio Spectrum provides the radio waves that support wireless services used by people and businesses every day, including Wi-Fi which is mostly taken for granted yet it is one of the mostly used form of system-to-user wireless connectivity. Indeed, "*Wi-Fi plays a significant role in enabling wireless connectivity [because] it provides the final link between people's routers and the increasing number of wireless-enabled electronics devices in their homes including TVs, smart appliances and connected consoles*" (**OfCom**). *(https://www.ofcom.org.uk/__data/assets/pdf_file/0038/189848/consultation-spectrum-access-wifi.pdf)*

This is equally true for offices and public places (such as restaurants, parks, gyms, etc).

Therefore, in considering the measures for decongesting the networks and/or improving the traffic volumes, the Wi-Fi component should not be ignored because it is a critical element. Specifically, it is essential that the Wi-Fi spectrum bands and the healthiness of Wi-Fi systems/connectivity are evaluated to ensure that the Wi-Fi component does not present a bottleneck in connectivity of end-user terminals.

In January 2020, the OfCom published a consultation aimed at *("improving spectrum access for Wi-Fi")* (https://www.ofcom.org.uk/__data/assets/pdf_file/0038/189848/consultation-spectrum-access-wifi.pdf)

in which the OfCom is proposing the following measures to improve the Wi-Fi experience for people and businesses:

1. Making the lower 6 GHz band (5925-6425 MHz) available for Wi-Fi. The release of this spectrum would enable also very low power (VLP) outdoor use.

2. Removing the Dynamic Frequency Selection (DFS) requirements from Wi-Fi channels in the 5.8 GHz band (5725-5850 MHz).

Borrowing from **the case of Of Com(UK)** (https://www.ofcom.org.uk/__data/assets/pdf_file /0038/189848/consultation-spectrum-access-wifi.pdf) outlined above and in view of the foreseen growth of connectivity needs and traffic volumes, it is important the countries prepare in good time by ensuring the Wi-Fi component does not became a bottleneck, by among other things, accelerating the activation o fWi-Fi usage on a licence - exempt basis of bands 5925- 6425 MHz and 5725 - 5850 MHz and Channels 1 to 4 of the WiGig (GigabitWi-Fi) bands in the 60GHz band, or parts thereof.

The WiGig has six (06) channels as follows Channel 1 (57.24 to 59.40GHz), Channel 2 (59.40 to 61.56GHz), Channel 3 (61.56 to 63.72GHz), Channel 4 (63.72 to 65.88GHz), Channel 5 (65.88 to 68.04GHz) and Channel 6 (68.04 to 70.20GHz). However, given that that range 66 – 71 GHz is identified for IMT, it is advisable to discount channels 5 and 6 for WiGig for the sake of sharing and compatibility with IMT.

Based in part on the case of the UK, **Option 6**, entails administrations accelerating the activation of Wi-Fi usage on a licence-exempt basis of bands 5925-6425 MHz and 5725-5850 MHz and Channels 1 to 4 of the WiGig (Gigabit Wi-Fi) bands in the 60GHz band, or parts thereof.

Option 7 – Accelerating the medium/long term policy and regulatory actions, by among others, expediting the implementation of WRC outcomes

History is clear on how epidemics/pandemics and other calamities have shaped the way of life of societies and communities either on a small or grandeur, global scale. In the case of the current COVID-19 epidemic, it is expected that the imperatives for the network optimization and enhancements envisaged by the above **Options** will became the "**new normal**" post-pandemic because e-working and e-learning will likely became the norm. This raises the importance of ensuring that everyone is being connected at home in residential areas of the urban as well as in rural and remote areas.

The COVID-19 pandemic has put the spotlight on the outstanding issue of the unconnected millions of people (mostly in rural and remote areas) and the urgent need to double the efforts of connecting them quickly and affordably.

On its part and pursuant to the action of coordinating the "*efforts to harness the potential of emerging technologies such […] IoT and 5G to improve people lives in Africa*", the ATU will soon embark on developing recommendations on 5G implementation in Africa as well as other forms of emerging technologies such as HAPS, ESIMs, MSS and WiGig. The aim of the recommendations would to assist countries in implementing the said medium/long term actions with the overall objective of ensuring that the digital divide forms of ICT applications' and coverage are addressed expeditiously and sustainably.

Therefore, and in order to prepare for the unavoidable new normal, this **Option** entails countries embarking on the implementation of the medium and long term action items contained in the "*Action Plan on ICT Sector COVID 19 Response*" as early as now, by among

other things, implementing the outcomes of previous WRCs. Specifically, national/regional frequency allocations, national assignments and licensing proceedings, aimed at timely introduction of IMT2020/5G and other emerging, innovative technologies such as HAPS, ESIMs, WiGig should be initiated as early as possible. The overall objective should to ensure that the digital divide forms of ICT applications' and coverage are addressed expeditiously and sustainably.
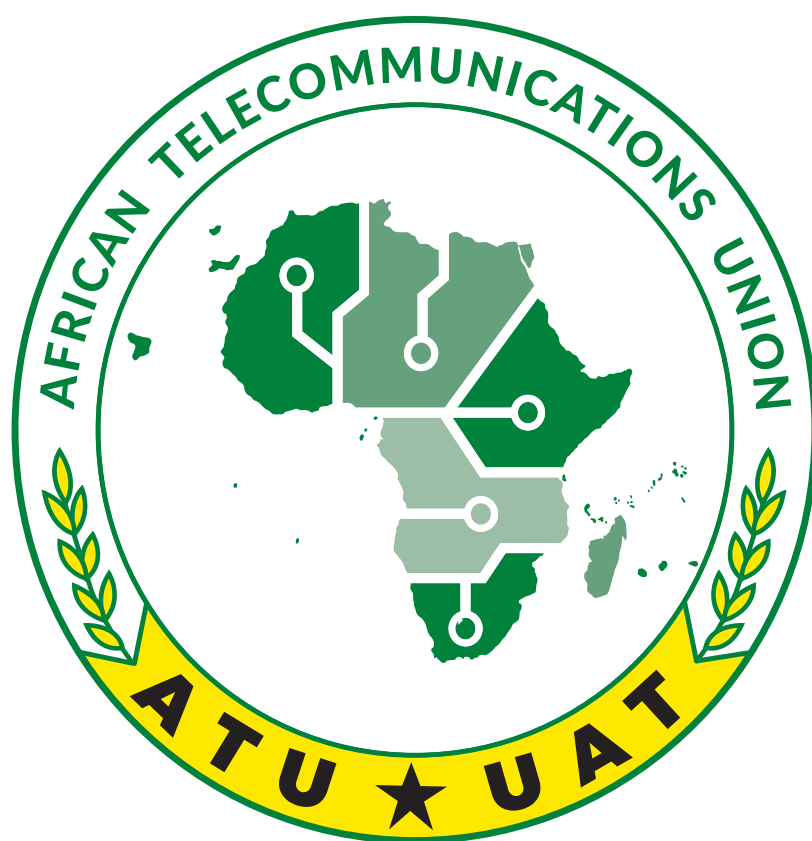
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