# Outcome report: Opportunities of satellite connectivity

Session date and time: Session 6,  Friday, 9 July 2021, 16:00 – 17:30 Geneva
Organized by UNOOSA, Office of UN Secretary-General's envoy on technology and ITU

**Remarks:**
- Ms. Maria-Francesca Spatolisano, Assistant Secretary General, Officer in Charge, Office of SG's Envoy on Technology
- Ms. Simonetta Di Pippo, Director, UNOOSA (Video)

**Moderators**
- Ms. JeoungHee Kim, Program Officer, Office of the Secretary-General's Envoy on Technology and ICT Analyst, ITU
- Ms. Nathalie Ricard, Scientific Affairs Officer, UNOOSA
- Mr. Jorge Ciccorossi, Space Systems Coordination, ITU

**Panels**
- Mr. Dimitri Buchs, Senior Consultant, Euroconsult
- Mr. Mike Lubin, Vice President Corporate Development, Viasat
- Ms. Abimbola Alale, Managing Director/CEO, Nigerian Communication Satellite Limited
- Mr. Chen Wensheng, Vice President of China Satellite Communications Co., Ltd
- Mr. Dominic Hayes, Space programmes frequency manager, European Union
- Ms. Laura Roberti, Director of Licensing and Market Access, Telesat Canada
- Mr. George Kwizera, CTO, Rwanda Space Agency

1. **Session summary:**

   Daily life for a large portion of the world's population now involves sharing information via mobile phones, personal computers and other electronic communication devices. However, many people remain left behind, living in areas still not reached by Internet infrastructure or with few, unaffordable options for connectivity. Space-based technologies, namely communications satellites, enable global telecommunications systems by relaying signals with voice, video and data to and from one or many locations. While a variety of earth-based alternatives to space technologies exist, space-based technology can often reduce the need to deploy infrastructure and offer more cost-effective service delivery options.

   Providers of new satellite technologies and applications aspire to tap into unserved and underserved areas, creating a significant market for affordable global internet access. Past efforts were devised mostly based on satellites in Geostationary orbit using traditional C and Ku frequency bands. The recent developments in the launcher sector,

which are reducing the costs of sending satellites into orbit, together with the innovation in satellite technologies and antenna that allows the use of new frequency bands with higher throughput dynamically configured based on the demand, could finally achieve the long-standing ambition to bridging the digital divide through new satellite developments. This session contributed to the joint effort for the implementation of Key Actions on Global Connectivity outlined in the United Nations Secretary-General's Roadmap for Digital Cooperation, as well as the Sustainable Development Goals 9.C Target, 'Significantly increase access to ICT and strive to provide universal and affordable access to internet in LDs by 2020'.

2. **Main outcomes highlighting the following:**

a. **Main issues discussed**

1) Present respective recent activities in various world regions to connect underserved areas, explaining lessons learnt, limitations, and what would be required to ensure universal access within 10 years.

2) What else can be done in terms of space policies and regulations to incentivize satellite services providers to invest in connectivity, and regulators to guarantee the access to spectrum orbit resources?

b. **Key achievements and challenges shared by the panelists and/or the audience**

**Panel 1**

1) *Euroconsult* presented prognoses of evolution of the market of connectivity via satellite and foresees that the number of addressable users could increase by a factor of 2.5 by 2029, with in parallel, an average revenue per user decreasing for service providers.

2) *Viasat* has been providing connectivity services to a variety of users for many years, with technology based on geostationary satellites. Viasat pointed out that, when discussing affordability, it is essential to properly evaluate what amount of bandwidth and total amount of data users are truly needed, as essential services - such as a telemedicine consultation can be provided with little capacity. Viasat noted that there is a large variety of technical offers for satellite communications and questioned whether the tremendous numbers of satellites to be launched in low Earth orbit to complete constellations might constitute a risk to the sustainability of outer space activities as proliferation of objects might lead to uncontrolled growth of space debris.

3) *NigComSat* is providing satellite connectivity services based on geostationary satellites with their own spacecraft and have seen tremendous take-up of their offer; they are now planning to launch a new high throughput satellite to reduce the cost of capacity and are deploying several thousands of VSAT terminals, training local personnel to do so. NigComSat pointed out that developing connectivity by satellite is not merely a task for satellite manufacturing industry and operators but requires setting up an entire eco-system of stakeholders, with, for instance, staff trained to provide installation and maintenance of ground stations and user terminals. In this sense, NigComSat stressed that satellite

connectivity can be seen as an opportunity to create technically qualified local jobs in developing countries.

4) *China Satellite Communications Corporation* explained what services they provide with their existing fleet of 14 satellites. Besides connectivity they offer a range of voice, video and internet services to maritime and airborne users, as well as emergency communications. They noted that the market has evolved from providing connectivity to providing value-added offers with platforms and applications that differentiate the service providers.

5) All speakers welcome the evolution of technologies that enables provision of significantly more bandwidth with a single satellite and noted that a key element is to provide user terminals at an affordable price.

**Panel 2**

1) The Moderator - Mr. Ciccorossi briefly described the evolution of satellite developments since 1957 until today with HTS GSO satellites and emerging NGSO constellations accounting for 1700 satellite networks coordinated, operating and recorded in the ITU Master International Frequency Registry (MIFR) corresponding to 68 Members States using 4 THz of Spectrum to provide satellite services globally with 99.94 % of spectrum free of harmful interference. He highlighted that this has been achieved thanks to the vision of ITU Members States that introduced space regulations in 1963. However, despite of these achievements in the space sector and the current technologies also available in terrestrial services ( 3G, 4G, 5G, fixed, WiFi, fiber optic, etc) it was recalled that 3.7 Billions of people ( 47 % of world's population) are not connected yet and he invited the panelists to provide their views on the current situation and possible solutions, from the space stakeholders roles, to connect the unconnected.

2) *The European Union* presented the EU project of multi-orbital architecture based on existing GSO plus new LEO and MEO constellations to be added to improve the coverage within Europe initially and later on to extend it to Africa and rest of the world.
*Telesat* presented the characteristics of Telesat LightSpeed Constellation which includes optical links and global coverage. She also mentioned the need for government support schemes, streamline the licensing process, blanket licenses, reasonable spectrum prices, availability of sufficient spectrum and protection of the 28 GHz band for satellite communications. Finally, Ms Roberti also addressed the need of support of those WRC-23 Agenda Items ( e.g. AI 1.16 ) that will facilitate the deployment of these technologies.

3) *The Rwanda Space agency* addressed the importance of listening to the end users and customers, among all players, to satisfy their telecommunications needs.

4) At the closing of the panel, the Moderator highlighted that mobility applications by satellite like MSS or ESIMS not only fulfill the role of providing connectivity on the move, but also reaching those areas that are currently underserved or unserved. Panelists agreed on this.

**c.    Main conclusions reached during the discussion**

In summary, based on panel discussions as well as inputs from the audience provided through an online poll, the main conclusions are:

- ✓ Emerging systems will provide more opportunities for connectivity.
- ✓ Technology is not a concern, but lack of affordability is still the major reason for the unconnected world's population.
- ✓ Government support plays an important role in leveraging the benefits of satellite connectivity to bridging the digital divide.
- ✓ Streamline licensing process and facilitating landing rights should be put in place.
- ✓ Standards are needed to facilitate the deployments of satellite terminals and to reduce their costs
- ✓ To ensure adequate spectrum for satellite communications and mobile applications. (e.g. WRC-19 AI 1.5 on GSO ESIMs and WRC-23 A.I.1.16 on NGSO ESIMs)