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| CHALLENGES IN THE PROVISION OF TELECOMMUNICATION SERVICES BY NON-GEOSTATIONARY SATELLITES IN LOW-EARTH ORBIT  |
| **Purpose**The purpose of this contribution is to present the aspects of the provision of non-geostationary satellite (non-GSO) communications services in low-Earth orbit (LEO) that have an impact on the international telecommunication service and the challenges faced by African countries.**Action required**This contribution is submitted for **consideration** and **adoption** in the action plan of the Working Group of Experts on the ITRs. |

# 1 Introduction

In the context of providing broadband services that meet consumers' expectations, the objective is to develop satellite communication systems with performance comparable to terrestrial telecommunication systems. These include non-geostationary low-Earth orbiting (LEO) satellite systems.

Although low-Earth orbit satellite systems were introduced in the early 1980s, it is only in the last few years that investments in setting up constellations of LEO-type satellites, particularly for the provision of high-speed Internet access services, have increased substantially. In addition to the services normally provided by VSAT, these systems include the use of smartphones to make voice calls and connect directly to the Internet.

This technological development, which is welcome and will certainly help to reduce the digital divide throughout the world, nevertheless raises concerns that merit examination in the light of the ITRs.

Apart from the risk of disruption of national markets for telecommunication services, these developments raise the question of technical, regulatory and security competencies relating to their use, skills that are not available in all countries.

By way of illustration, we can mention the companies STARLINK and ONEWEB, which have a network made up of hundreds or even thousands of satellites placed in low Earth orbit with the ambition of providing high-speed Internet access and voice service everywhere in the world.

# 2 Issues

## 2.1 Economic and strategic challenges

Satellite network operators do not need to deploy their own network infrastructure in the countries they serve. Services are de facto available throughout the territory to any user equipped with appropriate terminal equipment.

On the other hand, in the case of terrestrial networks, particularly on the access side, major investments are required, in particular for the deployment, operation and maintenance of radio stations, poles, ducts and active optical equipment. In addition to the investment required, national coverage would take time.

Furthermore, recent technological developments in standards organizations (ITU, 3GPP), satellite operators and mobile operating systems (iOS, Android) are tending to make satellite connectivity available directly on smartphones (direct-to-handset / direct-to-device / direct-to-cell satellite communication).

This situation would present a risk of distorting competition, especially as satellite telecommunication services become substitutable for terrestrial telecommunication services, in regard to the performance and the announced tariffs. The rapid fall in prices could lead to an erosion of revenues on the data market, leading to a drop in investment and the risk of crowding out terrestrial infrastructure operators from the ecosystem.

This raises the issue of coverage of territory in developing countries and the low contribution of these systems to the economies of developing countries.

## 2.2 Security challenges

Providers of satellite communications services typically rely on earth stations located outside the borders of the territory they serve, which are the key facilities of its ground network.

This reduces the possibilities of those countries to meet security requirements, as appropriate, for example:

– partial or total suspension of services;

– lawful interception of communications;

– traffic control and the fight against fraud;

– any other mechanism to be put in place at the request of the competent authorities.

The inability of developing countries to exercise control over these new players could encourage the development of illegal activities and even terrorism.

## 2.3 Digital sovereignty challenges

The use of satellite systems in low Earth orbit could jeopardize the ability of countries to regulate and control telecommunications/ICTs due to the extraterritoriality of these telecommunication systems.

This raises other concerns, in particular taxation and equality of actors in the provision of telecommunication services.

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