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Contribution by ITU

to the CSTD 2019-2020 priority theme on “Exploring space technologies for sustainable development and the benefits of international research collaboration in this context

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## ITU input to CSTD's Annual Themes for 2020

**THEME 2:** Exploring space technologies for sustainable development and the benefits of international research collaboration in this context

**1. Can you give examples of projects/policies aimed at using space technologies for sustainable development?**

The development and future deployment of non-Geostationary Orbit Satellite (non-GSO) FSS constellation is an example of service that will use space technology for sustainable development.

Non-GSO have the potential to increase access to broadband infrastructure and bridge the digital divide, especially for the populations living in rural areas. Access to terrestrial networks is limited or non-existent in many parts of the world, particularly in sparsely populated rural or remote areas. Satellite technologies are well-placed for the delivery of broadband services in those areas either on their own, or in combination with other technologies.

Although satellites are key to delivering broadband Internet access to unserved areas (SDG #9), their impacts go far beyond that, including applications in urban and already-connected areas, which are important to the aviation, maritime, energy, and other sectors, enabling new capabilities and applications in areas already connected to the global network, and helping drive down costs for many people.

Space-based connectivity is helping make smart societies a reality (including intelligent transport systems, e-government, tele-education, e-health, e-logistics, smart energy, smart agriculture), in both developed and developing countries. These technologies are also facilitating advances in sustainability, banking, and diverse government services and are having a deep impact on several SDGs.

**What are the main challenges confronted while trying to implement these projects/policies in your country or region?**

New Space stakeholders are willing to use the space technologies to create business. Activities from space point of view allow to have global impact. Including sustainable development in the business model is an added value to increase the market and attract various types of investors including states and academia.

However, as space activities are across borders, the companies lack the stability and protection offered by national policies to secure investments. While small satellite companies are developing, many states do not have a national space policy and do not have the resources or the priority to develop them. Moreover, today there is no international control of the responsibility of actors using space data and resources, including debris production, cyber security and their effects.

**2. Can you provide examples of policies/projects/initiatives aimed at promoting international research collaboration in the area of space technologies for sustainable development? What are the main challenges confronted in implementing these projects?**

Capacity-building and exchange of best practices is surely an important task where the international community can leverage the potential of space technologies for sustainable development.

Activities for capacity-building on space services include workshops, regional seminars and forums during which participants understand the technological developments, could exchange views, and learn about the opportunities and challenges of the satellite sector according to different stakeholders.

Recent events organized by the ITU have covered topics such as: Satellite Communication technologies, markets and trends, regulations and policies. Coexistence of small satellites with other systems in line with current technology and regulations, and new solutions on space monitoring. Spanning from the fundamentals of satellite communications, to emerging technologies and innovative applications.

At ITU, the AI for Good summits have a space track to promote global exchanges between stakeholders and push forward the requirements they may have at international level.

In 2018, the summit had seven key take away from the Satellite Track:

1. Since 2017, it is possible to **image the entire Earth's surface** to conduct **ultra-large-scale analysis** of continents in **near real time**. However, there is a trade-off between the availability of high-res data (which is available every few days) and low-res data (potentially every day), with high-res data obviously more costly and expensive to obtain.
2. Global satellite monitoring might even prove the equivalent of **global 'closed-circuit TV (CCTV)'**, and can be used to hold Governments and other parties **accountable for their actions** – e.g. mapping burning villages in conflict areas, or potentially mapping carbon dioxide emissions for future conformance/compliance with the Paris climate accords or other agreements.
3. We are moving from historical analysis to **real-time information** (e.g. retreat of the ice caps) and we shall increasingly move to **predictive modelling**. Using AI means we can also economize on human analysis time and save the human analyst time for the tasks really needed.
4. We are moving from data asymmetries/poverty to **information asymmetries** with a potential impact on whole markets – e.g. foreknowledge of steel production depending on furnace heat, or size of potential oil reserves in a new discovery.
5. The purposes we think imagery (and the associated data) may be used for are **not always how they get used** – we think they may be used to achieve the SDGs, when in fact it may make exploitation even more efficient. Privacy also needs to be secured. There are a number of major users of satellite data not even at the development table or talking with the development community (military on truck movements, Wall Street for crop yields and taking positions on the futures market).
6. For deforestation, a **road going into an area is the best predictor** of the development of agriculture (electrification and a potential increase in local incomes) within five years, as well as predictor of deforestation. This means that while satellite imagery could help with the monitoring of certain SDGs (e.g. for tracking climate change), it could also help humankind become even better at finding and exploiting the Earth's natural resources (including fish reserves). **There may literally be nowhere to hide from the eye(s) in the sky!**
7. Regional learning in predictive models – algorithms trained in Africa may not always work in India – there are **dangers in generalizing**, while models can only be as good as the data they are trained with – the quality of the data can determine the quality of the model.

- 3. What are the actions that the international community, including the CSTD and STI Forum, can take to leverage the potential of space technologies for sustainable development, including through international research collaboration in this context?**

**Can you give any success stories in this regard?**

The Space stakeholders are encouraging the international community, the CSTD and the STI Forum, to continue to coordinate their actions and develop complementary areas of expertise without overlap but in an inclusive way. Space and AI are not just “buzzwords” of today, but real potential for achieving the SDGs if the right policy allows business to grow ethically and accountable to the global society. The Radio Regulations ensures the international right of operation of frequency assignments once registered in the Master Register. It is amended at each World Radio Conferences to adapt to the needs of the sector.

- 4. Could you suggest some contact persons responsible for projects/policies, related space technologies for sustainable development and international research collaboration in this context as well as any experts from your Agency, academia, private sector, civil society or government dealing with projects in this area?**

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