Topics (T)
Interactive Presentations (IP)

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TACKLING CLIMATE CHANGE THROUGH COMMERCIAL SATELLITE-BASED PROJECTS: A TAXONOMY OF THE ESA BUSINESS APPLICATIONS PROGRAM

Abstract

Climate Change is one of humanity's biggest challenges today, and satellite technologies are increasingly seen as a key tool in tackling it. The European Space Agency (ESA) Business Applications program is fostering the adoption of satellite technologies in non-space domains (e.g., Agriculture, Wildlife, Natural resources), promoting the development of commercial satellite-based projects (i.e., projects developing business applications based on satellite technologies and data) and contributing to achieving Sustainable Development Goals (SDGs).

Despite the clear benefits, professionals and academics lack a holistic view of the current development of commercial satellite-based projects in tackling Climate Change.

In this study, we develop a taxonomy of the ESA Business Applications project portfolio, analysing 696 projects across 31 variables mainly sourced from the program's web pages. We perform descriptive statistics and exploratory data analysis to describe the features of commercial satellite-based projects that directly or indirectly support tackling Climate Change. Moreover, we perform an in-depth analysis of the 169 SDGs targets impacted by commercial satellite-based projects in i) the Environment, Wildlife and Natural Resources, ii) Infrastructure Smart Cities and iii) Food and Agriculture domains.

Our results show the characteristics of the commercial satellite-based projects impacting SDG 13 (Climate action) and corresponding targets. Besides, most commercial satellite-based projects developed in the Environment, Wildlife and Natural Resources domain directly impact SDG 15 (Life on land), dealing with deforestation and preserving biodiversity and natural habitats. Infrastructure Smart Cities satellite-based projects the most impact SDG 11 (Sustainable cities and communities), dealing with sustainability efforts in cities. Food Agriculture commercial satellite-based projects impact SDG 2 (Zero hunger), tackling food scarcity and the efforts to increase food production resiliency and sustainability.

In conclusion, the ESA Business Applications program is crucial in promoting commercial satellite-based projects in non-space sectors to tackle Climate Change and achieve the SDGs. We present a virtuous example of cooperation across public and private sectors to address the need for climate change environmental intelligence. We offer an instrument to practitioners to spot the gaps and identify the existing opportunities to tackle Climate Change through commercial satellite-based projects. Researchers

may adopt the methodology in other contexts overcoming the geographical and data accessibility limitation of our research.