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Earth Observation Applications, Societal Challenges and Economic Benefits (5)

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SOCIAL BENEFITS ASSESSMENT OF EARTH OBSERVATION MISSIONS THROUGH THE SDG2030

Abstract

The 2030 Agenda for Sustainable Development, subscribed by all the United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet. The Agenda lists 17 goals, the Sustainable Development Goals (SDGs), which state a path to be followed by all the countries within 2030 for the global development. Earth orbiting satellites and especially Low Earth Orbit (LEO) satellites lie in a privileged location to monitor our planet. This allows Earth Observation (EO) missions to contribute to the achievement of the SDGs, as extensively recognised by both space agencies and the UN.

In this paper a new methodology is presented to provide agencies, governments and stakeholders a tool to assess the societal benefits of EO missions. The aim of the proposed approach is to quantify the social value rating of the missions through the achievement of the SDGs. For this purpose, nine Services provided to Earth by EO missions have been identified: Built-up land (i.e. all kinds of man-made constructions), Agriculture, Wild nature, Geology, Limnology, Oceanography, Meteorology, Air Quality Monitoring and Hazards Monitoring. The evaluation of the social benefits is carried out introducing four indices relating satellite payloads to these Services, which are linked to the SDGs. The four indices focus on the payloads main characterizing factors: Temporal resolution, Spatial resolution, Spectral efficiency and Earth coverage.

The dissertation is currently limited to repeating Sun-synchronous circular low Earth orbits, which represent the majority of EO missions, and both passive and active (Synthetic Aperture Radars) sensors are analysed. The investigation can also be rearranged as a tool to maximize the social outcome of a mission during its design phase.

The model is applied to the Copernicus program, in order to assess its contribution to the achievement of the SDG2030.