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

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THE ITALIAN EO MISSIONS FOR ENVIRONMENTAL PROTECTION, NATURAL AND ANTHROPIC RISK MANAGEMENT

Abstract

In recent decades, the worsening of environmental degradation processes has been either a driver and a consequence of natural or anthropic disasters, threatening the resilience of affected communities. Every day, Italian Earth Observation (EO) missions acquire a large amount of remote sensing data, enabling a multi-sensor/multi-mission approach that, integrated with in situ information, allows a deeper understanding of the main geological, geophysical and environmental phenomena and processes. Given these unique capabilities, the aim of this paper is to describe the contribution of the Italian EO missions to environmental protection and prevention and monitoring of natural or man-made disasters. In this context, the COSMO-SkyMed and PRISMA missions represent the state-of-the-art of EO systems, respectively based on SAR (Synthetic Aperture Radar) and hyperspectral technologies. Since 2008, the COSMO-SkyMed mission has been contributing to collect a huge set of images daily acquired over the globe, being also a Copernicus contributing mission. Thanks to its unique capabilities, the Italian constellation is able to offer a relevant contribution in the disasters management and in the Disaster Risk Reduction (DRR) strategies definition, which addresses events such as earthquakes, volcanic eruptions, landslides, floods and oil spills. The PRISMA mission, launched in March 2019, contributes to the observation of natural resources from space, as well as to the study of: environmental pollution, climate change on a global level and the effects of manmade activities on ecosystems. PRISMA provides valuable information to support the prevention of natural (such as hydrogeological) and anthropic risks (soil and water pollution). Advanced technological capabilities of the above mentioned Italian EO missions actively contribute to strengthen the resilience of communities in the reaction to natural or man-made disasters and massive environmental pollution by enhancing and optimising DRR strategies. Moreover, a continuous monitoring over time allow to reduce the economic and social damages caused by such disastrous events. The paper presents a selection of case studies and application services addressing indirect economic benefits stemming from the adoption of more effective risks prevention strategies thanks to the added value data made available by the Italian EO missions.