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INTEGRATED APPLICATIONS FOR FOOD SECURITY IN THE FRAMEWORK OF ASI INTERNATIONAL COOPERATION

Abstract

Food security has become one of the most pressing global challenges and its interrelated targets of ending world hunger, improving nutrition, accessing clean water and promoting sustainable agriculture have been recognized by the international community as a core sustainable development goals. Therefore, achieving these goals require concerted global actions and advanced tools and strategies to reduce world hunger and guarantee food security, as well as to promote and enhance sustainable agriculture while conserving biodiversity and protecting ecosystems.

In the domain of food security, satellite remote sensing could provide long-term data collection that could be effectively used to detect large-scale features and correlated changes over time. In recent years, accuracy and capabilities have increased along with the range of Earth Observation (EO) data sources and derived products. These technical innovations boost development of integrated applications that could support the decisions-making process, impacting food security decisions with valuable information.

In particular, the Italian Space Agency (ASI)'s COSMO-SkyMed and PRISMA missions represent the state-of-the-art of SAR (Synthetic Aperture Radar) and hyperspectral EO systems. On a daily basis, Italian EO missions acquire a large amount of remote sensing data, enabling a multi-sensor/multi-mission approach that allows for a deeper understanding of the main geological, geophysical and environmental phenomena and processes. Integrated with in situ measurements and information, EO data are helpful in addressing several components of the food supply chain and thus could influence food security policies.

The paper aims at present a selection of applications and case studies addressing food security goals, resulting from an agreement between ASI and the International Fund for Agricultural Development (IFAD), in relation to collaboration between Italy and Argentina SIASGE (Italian-Argentine System of Satellites for Emergency Management), "Multi-mission and multi-frequency SAR" and "Innovation for Downstream Preparation" ASI programs based on the integration of EO data collected by different space-borne sensors, boosting the exploitation of L-band SAR data (e.g. SAOCOM); on PRISMA data analysis within the framework of ASI and the Indian Space Research Organisation (ISRO) EO Working Group.