Earth Observation for Sustainable development: agriculture and rural development

D. Annandale[1], E. Aparicio[2], A. Burzykowska[3], R. Dost[4], E. Haas[5], S. Huber[6], A. Klaasse[4], P. Pasha[7], A. Rodriguez[8], B. Roos[2], N. Wielaard[9], R. Zurita-Milla[7, *]

[1]Lahmeyer International, Germany; [2]Nelen en Schuurmans, the Netherlands;
[3]European Space Agency (ESA), Italy; [4]eLEAF BV, the Netherlands; [5]GeoVille, Austria; [6]DHI-GRAS, Denmark;
[7]Faculty of Geo Information Science and Earth Observation (ITC), University of Twente, the Netherlands;
[8]SpaceTec, Belgium; [9]Satelligence, the Netherlands

Satellite Earth Observation (EO) has a tremendous potential to inform and facilitate international development work by providing evidences that can lead to improved land governance schemes. Since 2008 the European Space Agency (ESA) has worked with Multilateral Development Banks (MDBs) and their client countries to harness the benefits of EO in their operations and resources management. Recently, ESA started an initiative aiming at a more systematic approach in order to meet longer-term strategic geospatial information needs in both developing countries and international and regional developing organizations. This initiative brings together ESA, MDBs, client countries and European industries and knowledge institutions to work together towards the large scale exploitation of satellite data in support of international development by providing a suite of EO-based services and organizing various capacity building and communication activities.

The goal of this masterclass is to share the state of the art of EO-based services for evidence based sustainable development by demonstrating the use and benefits of these services in agriculture and rural development. In particular, the following theme`s will be addressed:

- *Agricultural production mapping and monitoring service*: assessing the status of agricultural production on a wide range of spatial and temporal scales.
- *Irrigation system management*: provision of estimates of irrigated area, identification of land suitable for irrigation, estimation of the impact of land use change on the water balance. Monitoring operations and evaluate performance irrigation schemes with objective information on irrigation performance in data-scarce regions.
- *Food security and agricultural risk management*: information on crop biophysical, soil and climate characteristics, but also on the occurrence, duration and intensity of natural disasters such as heat stress, droughts, and floods that strongly influence production figures.
- *Rural infrastructure investment planning and monitoring*: infrastructure mapping aids to devise policies and programs to meet specific rural development and market access objectives.
- *Land Degradation Assessment*: assessing the status and changes of environmental conditions and ecosystem functions on a wide range of spatial and temporal scales to rapidly reveal where change has happened in a consistent and repeatable manner.
- *Monitoring and Evaluation*: monitor the performance of interventions, and assist with final program or project evaluations. Establish baseline trends and conditions during implementation, and measure the impacts that occur during project construction and operation.

[*] Authors in alphabetical order. R. Zurita-Milla (r.zurita-milla@utwente.nl) is the presenting author.

The masterclass will start with a brief introduction to the EO4SD initiative followed by a high-level overview of remote sensing. After that we will present the various products that can be derived from satellite EO, emphasizing their added value for MDBs. Finally, we will illustrate one or more of the use cases that are currently being developed for the World Bank group, the Asian Development Bank and the International Fund for Agricultural Development.

From a practical point of view, the masterclass will consist of a presentation (45-60 minutes) and a Q&A guided session (45-30 minutes) where we will discuss how EO services could benefit the projects and/or activities of the audience.