

COPERNICUS DATA AND CAP MONITORING IN ROMANIA

A case study on agriculture monitoring using Copernicus Sentinel-2 time series.

The challenge

The Common Agricultural Policy (CAP) supports the implementation of sustainable models for the agricultural economy Europe-wide. It also creates the premise for a new challenge – the control and monitoring of the rigorous usage of subsidies over large areas of agricultural land.

Every year, more than 700,000 farmers access the EU subsidy mechanisms through the Romanian Agency for Payments and Intervention in Agriculture (APIA). The 2016 Eurostat Yearbook indicates that 71% of agricultural holdings with areas smaller than 2 hectares encompass 17% of the utilised agricultural area (UAA). This creates tremendous pressure on the resources allocated by APIA for compliance verification.

Earth Observation (EO) data provide wide and repetitive homogenous coverage, translated into an unprecedented amount of information referred generally as “Big Data”. The technologies benefitting from the data volumes represent a solid solution for a continuous monitoring of CAP compliance.

The space based solution

The Sentinel-2 satellites, part of the EU Copernicus data stream, hold an enhanced 5 day revisiting time. They deliver regular coverage over large areas, allowing a uniform observation of agricultural plots larger than 1.5 hectares. Historical data is also available for retrospective baselines. The superior spectral resolution allows the identification of the phenological growth stages and the distinction between various crops or crop classes.

Terrasigna developed and enhanced a technology based on automatic processing of multi-temporal series of open EO data, with the focus on Sentinel- 2. The work was developed under

the framework of the DataBio project using the Land Parcel Identification Scheme (LPIS) provided by APIA. The Agency issued a consistent set of user requirements matching the CAP implementation priorities. The research is in line with the current European initiatives focussing on the increased usage of Copernicus data for the monitoring and evaluation of CAP effectiveness.

Benefits to Citizens

A continuous agricultural monitoring service based on the analysis of Copernicus satellite time series is not just a CAP compliance tool but it can also offer supplementary information for both public authorities and citizens. The service can provide an extensive picture of the overall dynamics of agriculture at both pixel and parcel level. The paying agencies will be able to simplify the CAP compliance checks whilst benefitting from homogenous data



Copernicus Sentinel-2 image on June 2017 showing agricultural land fragmentation in South Western Romania.

Credit :Contains Copernicus Sentinel data [2017]/ESA

Thematic Area



AGRICULTURE, FOOD, FORESTRY AND FISHERIES

Region of Application



SOUTH MUNTENIA, WEST, NORTH-EAST, SOUTH-EAST

Sentinel mission used



S2

Copernicus Service used



-

Usage Maturity Level



4

regarding the crop areas and potential mismatches between the farmers' declarations and the situation in-situ. In addition, a broad portfolio of information can be added: summer- and winter-crop assessment, crop rotation, identification of degraded land, areas affected by abnormal humidity etc. Various data layers will be provided freely as Web Map Services to the civil society: monthly satellite countrywide mosaics, early drought warnings or precise statistics regarding crops. This can be further integrated with meteorological and socio-economic data and translated into scenarios on how future changes might affect land fragmentation and agricultural productivity.

Outlook to the future

Terrasigna aims to exploit the potential of Copernicus Sentinel-2 time series and to provide a near real-time agriculture monitoring service at national and European level, fully compliant with both Romanian and EU requirements. The farmers will benefit from modern and effective information in line with the principles of sustainable agriculture.



Buzau County, Romania. Example of possible mismatches (right image, in orange) between the declared and observed crop.

Credit: Contains Copernicus Sentinel data [2017]/ESA

“Geospatial services together with Copernicus data can serve as a significant tool for agricultural subsidy control, enabling easy and useful applications for farmers.”

Traian Crainic, Director IT-LPIS, APIA

Acknowledgements

The “Data-driven Bio-economy” DataBio project (www.databio.eu). This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 732064. LPIS sample data was received from the Romanian Agency for Payments and Intervention in Agriculture (APIA) within the framework of the project.

Cristian Flueraru, Cătălin Cucu-Dumitrescu, Marius Budileanu, Olimpia Copăcenaru and Florin Șerban.

TERRASIGNA, Romania

Email: cristian.flueraru@terrasigna.com

ABOUT COPERNICUS4REGIONS

This Copernicus User Story is extracted from the publication “**The Ever Growing use of Copernicus across Europe's Regions: a selection of 99 user stories by local and regional authorities**”, 2018, Edited by NEREUS, the European Space Agency and the European Commission.

The model cases focus on local and regional authorities who successfully applied Copernicus data in 8 major public policy domains. The views expressed in the Copernicus User Stories are those of the Authors and can in no way be taken to reflect the official opinion of the European Space Agency or of the European Commission.

Funded by the European Union, in collaboration with NEREUS. Paging, printing and distribution funded by the European Space Agency. IPR Provisions apply. Copernicus4Regions material may be used exclusively for non commercial purposes and provided that suitable acknowledgment is given.