MULTI-SCALE MONITORING SERVICE TO ASSESS AGRICULTURAL PRODUCTION

Service summary and potential applications

Due to rapid population growth, significantly increased food production is needed to feed the world. As a result, human impact on the earth's natural resources will further increase, potentially leading to land use conflicts. Therefore the central question on the future of global sustainable development is how this vast increase in food and agriculture commodities supply can be achieved in a sustainable way while promoting land degradation neutrality.

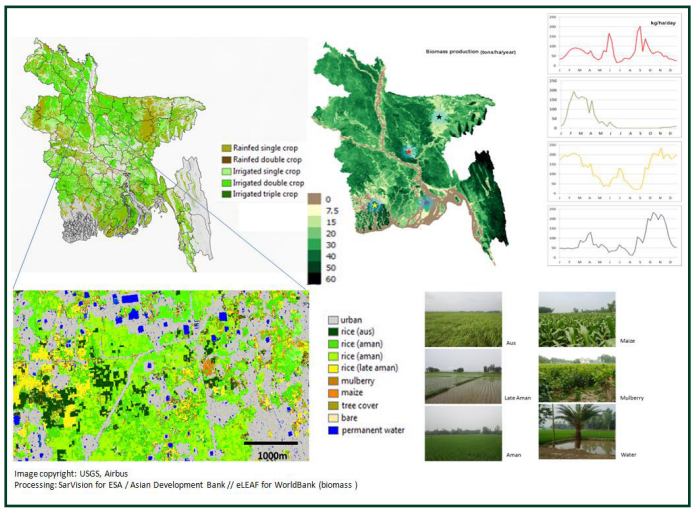
Earth Observation (EO) technology can provide information from the regional, national, to the parcel level, in order to help address these issues. National level applications can provide very frequent, spatially continuous, repetitive and homogeneous information on crop condition, distribution and dynamics over large areas for early warning. Historical and current data enable near-real time time-series analysis to assess change of environmental indicators and detect trends and anomalies.

Regional and local crop and pasture distribution maps are necessary baselines for climate-smart agricultural land use planning at the landscape scale. They are used for monitoring the performance of vegetation, and changes in agricultural cropland during the growing season, from field clearance, sowing, senescence, to harvesting. These independent and objective estimates of planted areas for a given region and a given growing season can be correlated with agrometeorological data to model yield output through statistical or smart pixel analysis.

Moreover, with local level data at very high resolution it is possible to assess the distribution and performance of smallholder farms that many Multilateral Development Banks (MDBs) target with their programmes. Both key production areas as well as marginal and vulnerable fields can be detected and analysed for performance indicators.

EO services can help to guide planning, execution and monitoring of programmes which objective is raising productivity, helping farmers reach markets, reducing production risk and financial risk (i.e. through microcredits and crop insurance) vulnerability and inequality, and making agriculture more environmentally sustainable. In addition, various monitoring tools can be developed to ensure compliance with best international industry practice and screening projects against the requirements of Performance Standards (PSs) on environmental and social sustainability.

Continuous and systematic mapping of cultivated areas by crop, type, acreage, irrigation supply and other basic crop parameters is essential for future sustainable development. The operational provision of reliable, objective, timely, transparent, accurate data on agricultural production is now possible along with provision of information on historic and ongoing shifts in cultivation practices, area expansion and intensification to support national agricultural monitoring reporting, and strategic interventions.



Multi-scale monitoring service to assess agricultural production in Bangladesh with (1) 250-meters country-level information on cultivated area, irrigation, cropping intensity, and biomass production (top) up to (2) 5-meters field-level information on crop type (bottom). Key information on agricultural production is updated on a weekly basis.

EO information services

Information service	Content / Products
Agricultural mapping service	» Cultivated area and distribution » Crop type, crop area and distribution » Irrigated/rainfed agriculture » Cropping intensity » Pasture area and distribution
Early Warning service	» Crop condition indicators & biophysical variables, environmental variables
Crop yield assessment and forecasting service	» Crop yield inputs (e.g. Leaf Area Index, Biomass production) » Meteorological data (e.g. cumulative and actual rainfall) » Start, peak and end (harvest) of season dates etc.

For more information, please contact:
ESA Technical Officer Anna Burzykowska (Anna.Burzykowska@esa.int)
Project Lead Remco Dost (Remco.Dost@eleaf.com)