Earth Observation for Sustainable Development

Enhancing evidenced-based planning, monitoring and evaluation of international development work for food security with satellite-based data and information.

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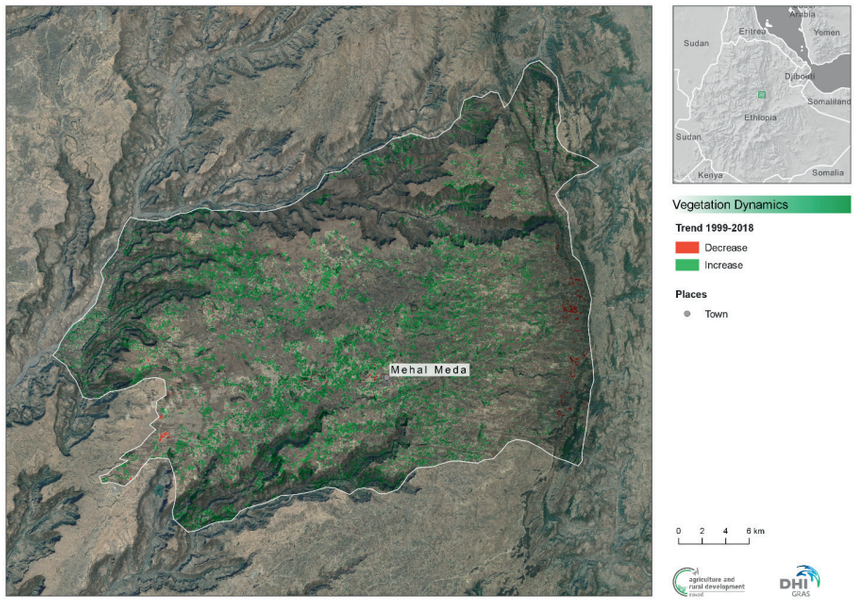
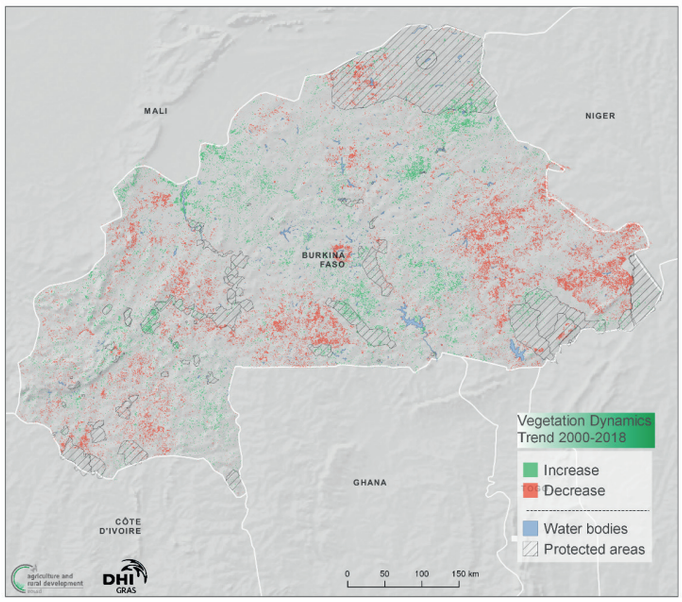
The challenge

Increasing demands for food, water, energy and essential services to fulfil the needs of a rapidly growing population have significantly increased the demand for land resources. As a result of the exacerbated intensity of human activity, many rural areas have experienced significant land degradation, consequently reducing the productive capacity of the land, in other words significantly reducing the production of food per land unit. Degradation is a complex process involving various driving factors, among which climate change, land use/cover changes, and human dominated land management play a significant role. Since land degradation is directly related to food security, international development work puts focus on sustainable land management and land degradation neutrality. However, concrete evidence on the impact of these investments does not exist, and the underlying drivers of land degradation processes



Satellite-derived vegetation dynamics at local scale for Menz Gera Midir (Ethiopia). For vast areas an increase in vegetation cover was mapped. The reason behind this trend is not known. The hotspots of decrease are mostly related to urban growth and steep areas.

Satellite-derived vegetation dynamics at country scale for Burkina Faso. Declining vegetation cover over the period 2000-2018 is mostly related to agricultural expansion and urban growth due to an increasing population. Increasing vegetation cover can be linked to protected areas but also mango and cashew plantations.



are not fully understood. This makes it difficult to identify policies and investments that will effectively combat desertification, to halt and reverse land degradation and halt biodiversity loss.

> **EO4SD introduced the satellite-based information collection and analysis to our project and partners. That was an eye-opener for me to think about the use of such information to document our base line and develop a monitoring system. I am still using the sample data EO4SD gave me for 2 districts as an example while I present the value of satellite-based information for our monitoring system. These data I got help me to demonstrate how satellite data, analysed and interpreted can have a meaningful information for policy makers.**
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> *UNDP Project Manager, Global Environment Facility, IAP Food Security Child project*

The space-based solution

Satellite Earth Observation has major potential to inform and facilitate international development work in a globally consistent manner. EO4SD – Earth Observation for Sustainable Development – is an initiative of the European Space Agency, which aimed to achieve an increase in the uptake of satellite-based environmental information within the regional and global programmes of the Multilateral Development Banks.

Many of the driving factors of land degradation can be monitored using earth observation satellites. With the launch of the Sentinel satellites of the European Union's Copernicus Programme, an unprecedented amount of free and open data has become available which allow monitoring even at local project scale. The integration of information from different satellites that consider land use/cover change, land productivity, long-term vegetation cover dynamics, climatic as well as other contributing factors and combined with local information allows for a comprehensive assessment of the biophysical baseline at project start and progress monitoring during implementation. The same thematic information is available at different spatial resolutions, connecting the regional dimension with national and local processes. Depending on the indicator, the information derived is typically available on a daily, weekly, monthly, or yearly basis, both historically and near-real time. With these characteristics, spatial evidence-based land status indicators can be extracted, and statistics calculated for investment planning and project monitoring and evaluation of projects implemented by Multilateral Development Banks.