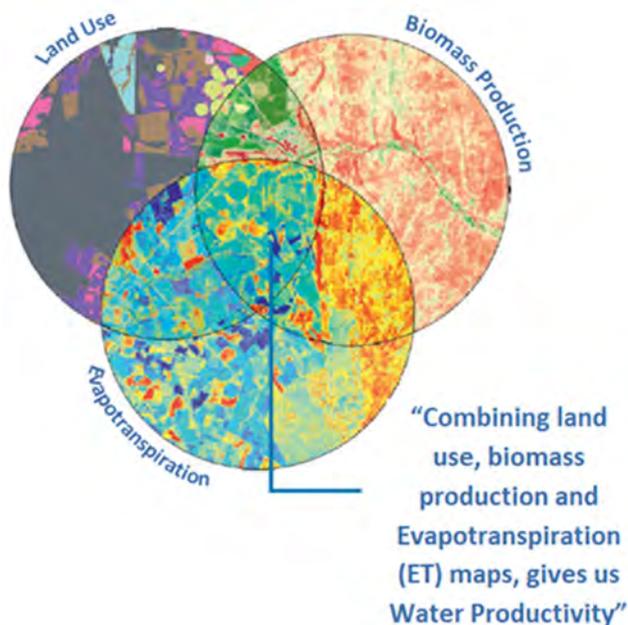


MONITORING OF CROP AND VEGETATION WATER CONSUMPTION FOR WATER DEMAND MANAGEMENT

The looming water crisis has prompted programs by international organizations, governments, non-governmental organizations (NGOs), industries, and food suppliers to focus on decreasing the volume of water used for crop production. Over the years, research in irrigation technology has focused on crop water supply and resulted in more efficient methods to bring water to the plant. Quantifying the consumptive crop and natural vegetation water consumption proved to be a bigger challenge that can be solved using EO services.

Earth Observation can provide information on the distribution of crops and vegetation and water extraction of these and make an important contribution to water management, enabling modelling of crop water needs and plant deficiencies to support irrigation planning and implementation activities. Other interventions include spatial planning of cultivated area addressing salinity and water-logging problems and water rights management (i.e. allocation of surface water in proportion to the area with water rights; allocation of surface water in proportion to actually cultivated area).

Using multi-spectral satellite images with sophisticated energy surface balance models water productivity can be calculated which is provided as a value per pixel (pixel size depends on the resolution of the satellite images used). This can be done on a global scale, per region, per country, per irrigation scheme and even per field. It can be provided for any vegetation covered land surface ranging from forests, to pastures and agricultural crops either rain-fed or irrigated.



SUMMARY

CHALLENGE

- Increasing water scarcity due to high population growth and increased food production
- Need to effectively manage water resources
- Need to assess water availability and optimize water use for irrigation

SOLUTION

- The EO service products can support interventions to improve irrigation and drainage management as well as water harvesting (water productivity, food scarcity)

VALUE

- Monitor the effect of interventions in a water system, such as construction, enlargement or rehabilitation of irrigation systems
- Monitoring and (historic analysis) of crop water productivity
- Design, implementation and operation of on- and off-farm water management systems
- Monitoring crop production and crop water consumption (such as the monitoring of actual versus licensed water use)
- Optimization of water use and energy consumption (e.g. by pumping)
- Water accounting: analyze system behavior based on crop and climate information

Satellite Earth Observation (EO) technology has a tremendous potential to inform and facilitate international development work. Since 2008 the European Space Agency (ESA) has worked together with the International Financing Institutions (IFIs) and their client countries to harness the benefits of EO in their operations and resources management.

EO4SD – Earth Observation for Sustainable Development – is an ESA initiative which aims to achieve a step increase in the uptake of satellite-based information in the IFIs regional and global programs, aiming at more systematic data user approach in order to meet longer-term strategic geospatial information needs in the individual developing countries as well as international and regional development organizations.

The EO4SD initiative cover a wide range of thematic domains including Water Resources Management which is regarded as one of the most critical development challenges.

The activities will start in spring 2016 and will run for a period of three years. The first year will be dedicated to stakeholder engagement and requirements consolidation and with years two and three focusing on information production, delivery and capacity building.

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