



Remote Sensing and GIS for sustainable agriculture and food security

FAO uses geospatial technology - satellite remote sensing, geographic information systems and global positioning systems - for **comprehensive worldwide assessment and monitoring of environmental conditions related to sustainable agriculture development and food security**. With the assessment and monitoring of land, water



and natural resources, FAO produces a broad series of geospatial data and information, from land cover and land use change to poverty mapping. FAO uses Geographical Information Systems (GIS) databases **in its appraisals of poverty, food security and rural studies**, including vulnerability mapping. These appraisals, in turn, support policy formulation at various levels and contribute to the delivery and monitoring of several FAO Strategic Objectives.

What we do

In collaboration with partners, we gather, manage and serve geospatial data and information, undertake assessments and develop monitoring strategies to support modeling and analysis of food security and nutrition. These in turn are used in monitoring and mapping progress of priority development assistance, and to assess the outcomes and performance of programme implementation. For instance our Global Agro-Ecological Zones data portal (GAEZ) enables rational land-use planning on the basis of an inventory of land and water resources and an evaluation of their biophysical limitations and potentials for crop production under different scenarios.



- We produce and maintain global databases for land valuation and planning (GAEZ and Global Land Cover Share), land monitoring (active fires and burned areas), and water productivity monitoring.
- We develop free and open source software, tools, methodologies and standards to assist countries in reliable and consistent assessment and monitoring of their natural resources.
- We provide capacity development and outreach initiatives for mapping and monitoring of crop areas and yield forecasting;
- We use earth observations to assess changes in vulnerable ecosystems (mountains, mangroves and deltas), estimate biomass growth at various levels, plan wood energy and map soil carbon and gaps
- We support national, regional, and global mapping programmes for the creation of multipurpose land cover change database(s). National examples include Libya, Malawi, Ethiopia, Sudan, South Sudan, Afghanistan, Pakistan, Senegal, Kenya and Lesotho.



The context

The availability of reliable and timely geospatial information on natural resources and environmental conditions and their changes is one of the prerequisites of sustainable agricultural development and food security.



In 1992, the United Nations Conference on Environment and Development (UNCED) adopted the Agenda 21 (Rio Declaration on Environment and Development), an action plan for sustainable development. It charted a new approach based on the premise that economic growth had to be supported by strategies for global conservation of land and water resources and environmental protection. Twenty years later, Rio+20 declarations recommended the employment of new geospatial technologies, satellite remote sensing, geographic information systems, and global positioning systems for comprehensive worldwide assessment of environmental conditions and the monitoring of their dynamics.

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