

## Service summary and potential applications

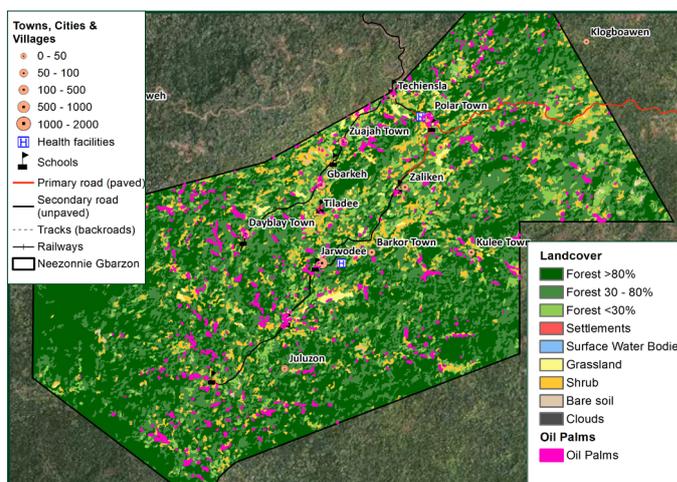
Sustainable rural development planning requires knowledge about farm and production management infrastructure, such as irrigation, water allocation and use, rural roads and transportation network development, as well as land administration and tenure. Furthermore, reliable data about settlements and related population distribution is needed to estimate development indicators such as the proportion of the rural population with adequate access to the transport system, primary education, health care, and agricultural markets.

Earth Observation (EO) based information combined with other sources of data can provide information to the planners and help them devise policies and programs to meet specific rural development and market access objectives. For example it is possible to derive information on rural residents' differential access to the all-season road network (i.e. the number of people who live within 2 kilometres or about 25 minutes walking time) or estimate the viability of fields and roads in the event of floods. The same landscape level mapping services can be used to identify lagging or underdeveloped areas (i.e. arable land, livestock grazing areas) - future productive lands and breadbaskets - if investment in infrastructure is stimulated.

Such information is often key to answer various land management questions. Reliable and spatially explicit analytics of land use and natural resources distribution (settlements, roads, cropland, forest, bioenergy/energy resources) can help to monitor land uptake trends (for agriculture, infrastructure, mining, settlements, plantations development, etc.), estimate future land use demand and manage potential land use conflicts. It can contribute to the development of various investment Monitoring and Evaluation (M&E) tools as well as to the mitigation of adverse impacts of infrastructure development on the environment.

Finally, such information supports the correct allocation and administration of resources through data-driven planning and monitoring. This pertains to a number of issues ranging from land concessions management, monitoring of farming systems and subsidies (actual crops planted and harvested) to water allocation and use (allocation of surface water in proportion to the area with water rights; allocation of surface water in proportion to actually cultivated area).

In particular, planning of irrigation infrastructure requires a good understanding of the need (water shortage), feasibility (availability of water, also depending on elevation), and potential (soil properties, climate), which can all be inferred from EO. Accurate information on (irrigated) crop acreage and its changes over the past years obtained from high resolution satellite data can show whether projects on strengthening food security in an area have resulted in an increase in cropland and crop productivity. Water deficits and especially biomass water productivity of fields can rapidly show whether water is equally distributed within an irrigation scheme, where irrigation maintenance and restoration of channels is required, and can also detect head-tail conflicts.



Knowledge about the location of oil palm cultivation areas, here in the province of Bloquia, Liberia, supports rural infrastructure investment planning. Together with information about settlements, roads, population and land use distribution, it allows to manage future land use demands and potential conflicts. Copyright: GeoVille for GOPA.

## EO information services

Information service	Content / Products
Planning and monitoring of rural infrastructure investments	<ul style="list-style-type: none"> <li>» Critical infrastructure for the supply chain (e.g. road network, storage facilities, transport infrastructure, irrigation infrastructure)</li> <li>» Analyse opportunities for irrigation development based on need, feasibility and potential</li> <li>» Administrative boundaries</li> <li>» Energy poles</li> </ul>
Demand and site suitability	<ul style="list-style-type: none"> <li>» Settlements</li> <li>» Population information</li> <li>» Land cover/use (e.g. agricultural ecosystems, crop areas, commodity types, trees, biomass, concessions, water)</li> <li>» Soil data</li> <li>» Climate data</li> <li>» Drought indices</li> <li>» Terrain information</li> </ul>

