POSTER ABSTRACT

AGRICULTURE EXPANSION PROJECTS: TECHNOLOGIES USED IN THE PROCESS OF PLANNING AND DESIGNING

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Abstract

Africa is seen as having vast potential for agricultural production on a large-scale basis, based on the assumption that there is land and water available. Most projects follow a number of steps to arrive at a point where a decision can be made on whether to pursue the project or not. The generally accepted steps followed are reconnaissance, pre-feasibility studies, feasibility studies, preliminary design, detailed design, implementation, commission and finally operation. This poster is focused on the technologies used in these stages.

Technology used in the process is an integration of small-scale and large-scale traditional hard copy maps/atlases with newer digital technologies, namely remote sensing technology by way of Earth Observation Satellites and LiDAR.

Initial high-level planning and feasibility studies make use of traditional hard copy topographical maps/atlases along with earth observation satellite digital elevation model (DEM at 1-arc second and 3-arc second) datasets. Following the feasibility studies, detailed investigations and design studies make use of LiDAR datasets. Ground truths, taken on-site during the project cycle, compliment the desktop simulations.

Topographic analysis (soils, climatic, water resources, vegetation, infrastructure), digital terrain modelling, spatial interpolation, surface analysis (hydrological modelling, slope, watershed, contour generation), hydraulic modelling (inundation and drainage), engineering design and 3D-visualisation is carried out in both vector and raster data models within a GIS, CAD, DTM survey and hydraulic modelling software providing highly detailed desktop simulations from the existing topography of the project area to the envisaged design topography of the project area.

Keywords: reconnaissance, modelling, topographic, LiDAR, hydraulic, drainage