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Developing a digital land resources database of Egyptian Nile valley, based on integrated GIS and satellite data

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The national development plans aim to sustain and raise productivity of arable lands. Development of a digital land resources data base is important for realizing best land use. The current article focuses on the Nile Valley, which gifts the Egypt land, among the hyper arid desert area. Information and maps, including analogue data, were digitized, geo-referenced and imported to a GIS model. Networks of irrigation, drainage, roads, railways and utilities, were included. SRTM, recent ETM+ and SPOT satellite images were utilized to validate thematic maps and develop DEM. Intensive field investigation, equipped by a navigation GPS, was performed, to collect ground control points and representative soil samples. It was found that 2.63% of the mapped soils is exhibited by soil order *"Aridisols"*, dominated by *"Petrogypsids"* great group at Northwestern desert fringes of Nile Valley. The *"Entisols"* soil order dominates the studied soils (97.37%), where *"Torrifluvents"* great group is pronounced (52.3%). The elevation ranges from 0 to 40 meters ASL. It was found that 15.5% of Nile Valley are classified as highly capable, corresponding with *"Vertic Torrifluvents"* soils sub great group. The low capable soils, corresponding to sub-great groups *"Typic Petrogypsids"*, *"Typic Haplosalids"* and *"Typic Petrogypsids"*, represent 1.7 of the Nile Valley. The most striking findings noticed were the urban encroachment on the account of most fertile soils. It could be concluding that achieving such detailed digital land resources database is a great step towards the implementation of sustainable development and management programs.

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Site suitability evaluation for sustainable urban development using GIS & AHP: A case study of Upper Egypt, Aswan city

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Site selection for sitting of urban facilities is one of the crucial policy-related decisions taken by urban planners and policy makers. The combination of GIS with fuzzy set theory and deterministic models is known as GIS Fuzzy Modeling (GISFM). GISFM was adopted for support sustainable land use planning. This paper considers the specific problem of creating a well-sustainable distributed of hospitals. We develop a Multi-Criteria Decision Analysis process that combines Geographical Information System (GIS) analysis with the Fuzzy Analytical Hierarchy Process (FAHP), and use this process to determine the optimum site for a new hospital in Aswan City. Based on actual conditions of the study area, we built a hierarchy model for selecting optimum health care services sites in Aswan city, Egypt. We considered two main factors, and 5 sub-factors. An application adopting the AHP idea was developed to calculate weights of the criteria of the site. The GIS was used to overlay and generate criteria maps and suitability map. The (GIS) was used to manipulate and present spatial data. All maps are graded from 1 (lowest suitability) to 5 (highest suitability) using spatial information technologies. The candidate sites were determined by aggregation based on the criteria weights. The candidate sites are divided by 'best', 'good' and 'unsuitable' landfill areas. Best health care site represent optimal sites; good health care site can be used as back-up candidate sites. Our work offers a siting methodology and provides essential support for decision-makers in the assessment of health care site management problems in Aswan City and other rapidly developing cities in developing countries.

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