Spatial Data Modelling: An Integrated Approach in Resource Data Acquisition for Land Use Planning and Sustainable Utilization

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Key words:

SUMMARY

The paper demonstrates the application of remote sensing technology and GIS platforms in development of standardized integrated spatial databases for modelling, planning and sustainable management of natural resources geared toward poverty alleviation. Environmental mapping and planning are key ingredients to the success of a number of environmental agendas set in the last 30 years. The UN Conference on Environment and Development (UNCED), the World Summit on Sustainable development and the NEPAD initiatives have called all countries to undertake a comprehensive national inventory of their land resources in order to establish a Land Information System (LIS), in which land resources are classified according to their most appropriate uses. The UNCED Action Plan, the agenda 21 recommends the use of advanced geo-information technologies, such as remote sensing, GIS and GPS for speeding up the completion of geo-spatial databases, thus providing reliable information on the land cover and land use.

The Department of Resource Surveys and Remote Sensing (DRSRS) within the Ministry of Environment and Natural Resources was established in 1975 and mandated to collect data and monitor the status of natural resources in Kenya. In particular, the department is concerned with gathering and analysis of information on wildlife and livestock population trends, human dwellings, vegetation mapping, land cover/use mapping, land degradation assessment and crop forecasting among other environmental variables. The application of remote sensing techniques is highly used in the mapping and monitoring of these aspects due to its rapid coverage, low cost, repeatability and spatial context. Geo-informatics and ground sampling are incorporated and the above information are integrated using Geographic Information System (GIS) platforms to develop structured databases for resource use modelling, planning and management geared to address poverty reduction and reverse environmental degradation. The department has developed a geo-spatial databank based on aerial surveys, aerial photography, high-level remote sensing and ground sampling for the last 30 years.

The department through the FAO Africover programme has again taken the first step in assessing land condition as exhibited by the land cover. This information will be used in formulating land use and conservation plans to assist policy development on various ecosystem services such forestry, water, biodiversity and aesthetics. DRSRS in collaboration with FAO/Africover has developed a country wide standardised land cover database to serve

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a number of government departments and key environmental partners in supporting the mapping and monitoring of land cover activity as well as sustainable resource development.

BIOGRAPHICAL NOTES

I am current the Deputy Head of the Data Management Division at the Department of Resource Surveys and Remote Sensing (DRSRS), Nairobi, Kenya. I am a Resource Ecologist cum GIS Specialist by profession having attained an *MSc. Degree in rural land ecology* at the International Institute for Geo-information Sciences and Earth Sciences (ITC), the Netherlands. I specialized in databases development, Geographic Information Systems (GIS) management (geo-spatial analysis and modeling), land ecology, natural resource management, land cover/use mapping, land use planning, evaluation, remote sensing applications, hyper-spectral and forestry, crop monitoring and environmental impact assessment. In addition, I have attained a *Diploma in wildlife management* at the College of African Wildlife Management, Tanzania with emphasis on animal ecology, mammalogy, range ecology, botany, herpetology, ornithology, fisheries sciences, wildlife management techniques, wildlife law, invertebrate biology, soil sciences, economics, man & wildlife, protected area planning and management. I have extensive research experience (20 years) in ecological monitoring surveys concurrently with remote sensing and GIS applications in resource planning and management.

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