

TITLE: The Use of Geo-Spatial Technologies for Land Cover Studies in Uganda

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Overview

- Uganda is a landlocked country in East Africa with high altitude, with landscapes ranging from wetlands to arid savannahs.
 - 35% farmland, 21% grasslands, 20% forest/woodlands, 15% water bodies, 6% bush land and 3% commercial farms/urban areas. Settlement patterns vary, with land ranging from densely populated to uninhabited.
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Overview

cont'd

- ❑ Uganda's economy is environment and natural resources based
 - ❑ sustainable development entails monitoring of the environment and natural resources and making attempts to balance the economic, social and environmental needs of the country.
 - ❑ National Environment Management Authority (NEMA) monitors, supervises and coordinates environmental management.
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Overview

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- ❑ The National Environment Act requires NEMA to produce a National State of the Environment Report every two years
 - ❑ Uganda is soon to produce the fifth report since 1994.
 - ❑ The environment being multi-sectoral in nature, NEMA works through lead agencies to try to achieve the goals of sustainable development
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Overview

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- Geo-spatial technologies recognized as having opportunities for monitoring the environment and natural resources.
 - Evidenced by the establishment
 - of GIS and Remote Sensing Unit within the Forestry Department
 - the establishment of National Environment Information Centre (NEIC), now NEMA, with a GIS section.
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Overview

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- The Forestry Department through the National Biomass Study Project produced the first ever Land Cover map for Uganda using SPOT Panchromatic imagery in 1992.
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Major environmental issues necessitating land cover studies in Uganda

- Urbanisation has increased. The built up areas keep expanding steadily.
 - **The nature and pattern of settlements is of environmental concern.**
 - Forests and woodlands
 - cover about 4.9 million ha or 24% of the total land area,
 - 19% is tropical forest. Of the total,
 - 70% is on private or customary land
 - 547,485 ha of natural forests on government land.
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environmental issues cont'd

- 90% of Ugandans depend on fuelwood as their primary source of energy and close to 1 million people earn their income from forestry
 - Wood harvesting is increasing at an alarming rate.
 - Forest cover has shrunk from 52% of Uganda's surface area to 24%.
 - **Annual deforestation rates are 9-17%/yr for different forest types and this is an environmental issue.**
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environmental issues cont'd

- ❑ Wetlands provide water to about five million people, and their livestock.
 - ❑ Wetlands purify industrial and domestic effluent.
 - ❑ Several million households are engaged in wetland farming.
 - including harvesting of papyrus, clay for pottery, brick-making, and sand mining.
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environmental issues cont'd

- Rapid conversion of Wetlands for development purposes has its associated environmental concerns**
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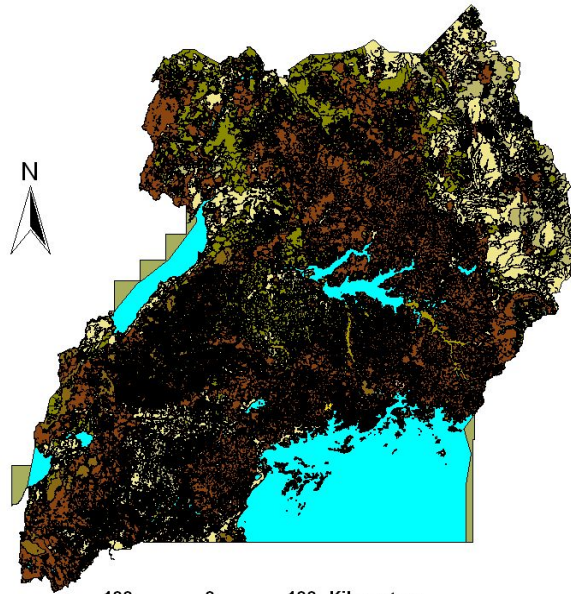
Development of Land cover studies in Uganda.

- ❑ First land cover map for Uganda was made by National Biomass Study Project of the Forestry Department
 - ❑ SPOT satellite imagery of 1990 used.
 - ❑ Different cover types visually interpreted and delineated on transparencies and later digitized.
 - ❑ Thirteen land cover classes were developed
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Land cover studies cont'd.

- Ground truthing resulting into the 1992 Land cover map for Uganda.
 - Land cover map for Uganda is shown in **figure 1** below.
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Landcover Map of Uganda



- | | |
|--------------------------------|--------------------------------|
| Barren land/rocks | Open Water |
| Built Area | Subsistence farmland |
| Bushland | Swamp |
| Commercial farmland | Tropical Forest (Encroached) |
| Forest Plantation (Coniferous) | Tropical Forest (Well stocked) |
| Forest Plantation (deciduous) | Woodland |
| Grassland | |
| Miscellaneous | |

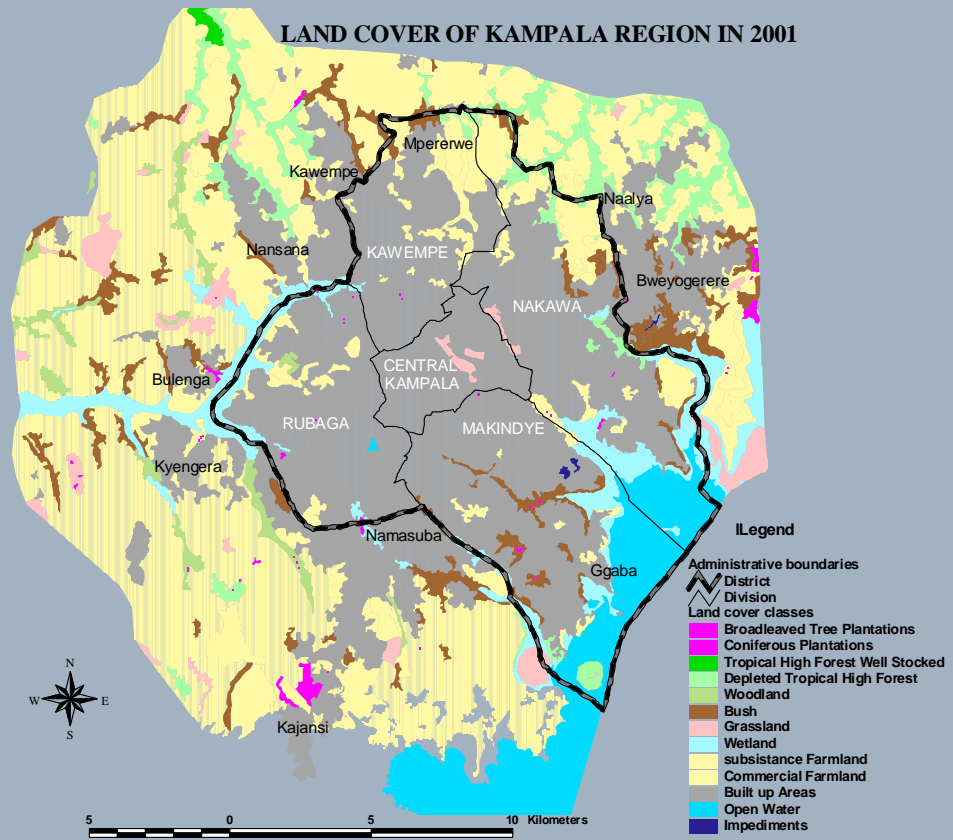
Updating of the landcover map

- ❑ The land cover map produced in 1992 now updated using Landsat TM imagery of 2001 (Africover).
 - ❑ Geographical Vector Interpretation System (GeoVis) software, developed by FAO, used to delineate the different cover types by
 - ❑ screen digitizing done
 - ❑ FAO land cover classification used (Not yet harmonised with existing classification)
 - ❑ change in land use in the Kampala region has been of interest
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landcover update cont'd

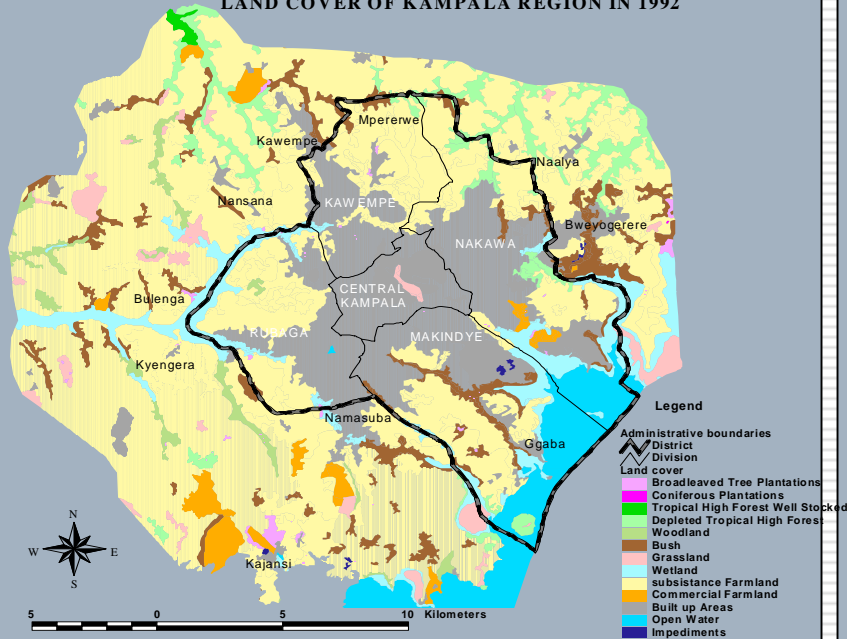
- a clip of Kampala region clipped from Africover image
 - Interpreted in Arcview based on Uganda classification by screen digitizing.
 - ground truthing done
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LAND COVER OF KAMPALA REGION IN 2001

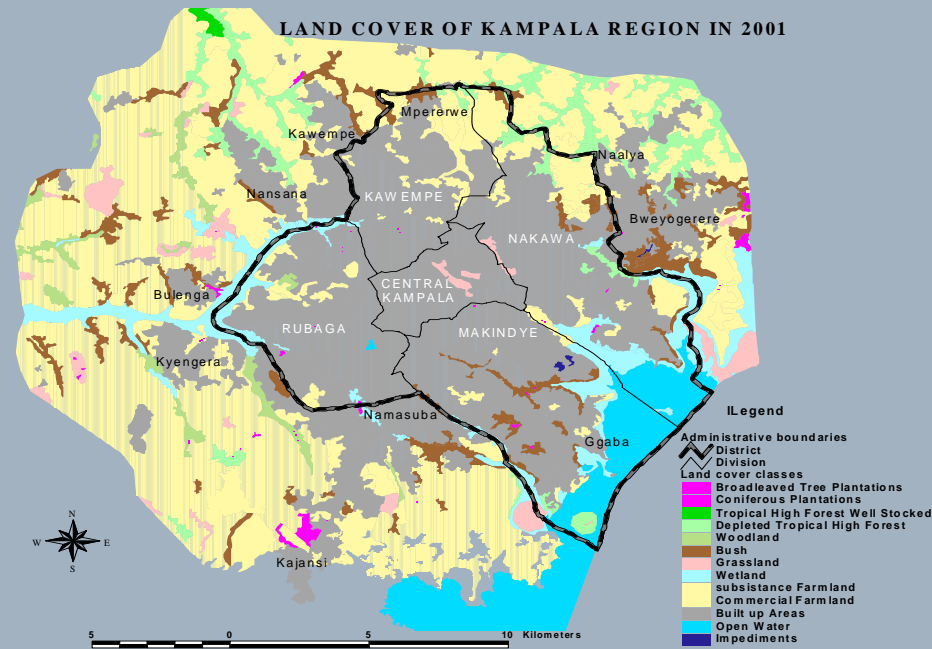




LAND COVER OF KAMPALA REGION IN 1992



LAND COVER OF KAMPALA REGION IN 2001



Biomass Assessments

- ❑ The land cover map is also used for biomass studies
 - ❑ Permanent Sample plots have been established in the different cover types
 - ❑ Volume measurements done after every 3 years
 - ❑ Biomass stock calculated for every cover type
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Biomass Assessments cont'd

- ❑ After every 10 yrs national biomass status report prepared
 - ❑ The report provides a picture of the energy status in the country.
 - ❑ The new land cover map is used to review the vegetation types
 - ❑ The number and distribution of the sample plots is accordingly reviewed.
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Other beneficiaries of the Land cover map include:

- ❑ Department of Agriculture for agricultural planning
 - ❑ Forestry Department for forestry development planning (afforestation activities)
 - ❑ Wetland Inspection Division for wet land inventories and wetlands management planning
 - ❑ Ministry of health for planning of mosquito control
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Beneficiaries cont'd

- ❑ Department of Veterinary Services for Trypanosomiasis control and ranches
 - ❑ Department of Physical Planning for Land use planning
 - ❑ Kampala City Council for urban planning; settlements, utilities, garbage management, sanitation etc
 - ❑ Department of water Development for planning water development
 - ❑ Surveys and Mapping Dept. for updating the topographic map of Uganda.
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THANKYOU FOR LISTENING
