



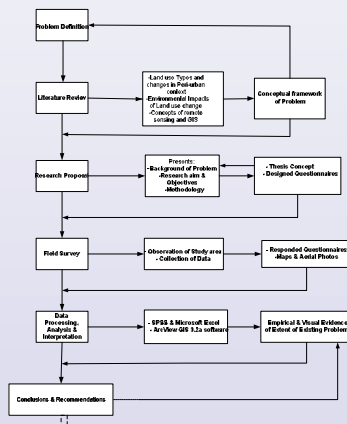
POSSIBILITIES AND LIMITATIONS OF USING REMOTE SENSING AND GIS AS TOOLS TO MONITOR LAND USE CHANGES IN THE PERI-URBAN AREAS OF GHANA

Master's Thesis by Charles Ankisiba

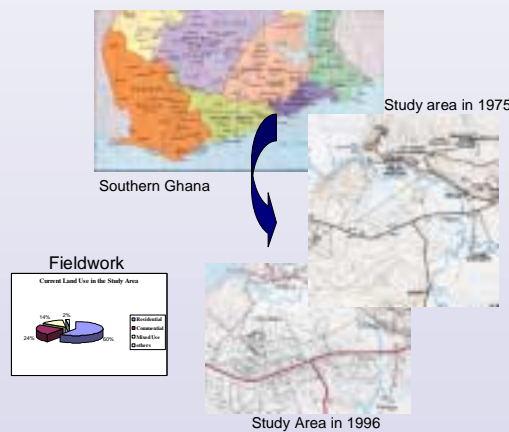
INTRODUCTION

The peri-urban area presents a complex land use pattern with diverse implications for land management. Rapid and uncontrolled land use changes are taking place in the Mandela (New Weija Town) area of peri-urban Accra. Current land use planning and regulations are not effective and institutional capacity is inadequate to deal with the situation. The development has significant environmental impacts in this part of the urban fringe. Remote sensing and GIS technologies provide a potential tool for monitoring land use changes and the opportunity for decision makers to make policies with a spatial perspective. A GIS was set up, combined with recent data from fieldwork, to facilitate analyses of the land use changes and the environmental implications in the area.

Thesis Workflow



Data Collected



Data Processing

1. Maps and aerial photographs were scanned and geo-referenced and then used as backdrop images for screen digitising.
2. For each polygon, attribute data describing the land use types were attached. Coverages for 1975, 1986, and 1996 were produced.
3. The built up land, and areas liable to flooding and inundation were delineated.

Data sets of the Mandela GIS

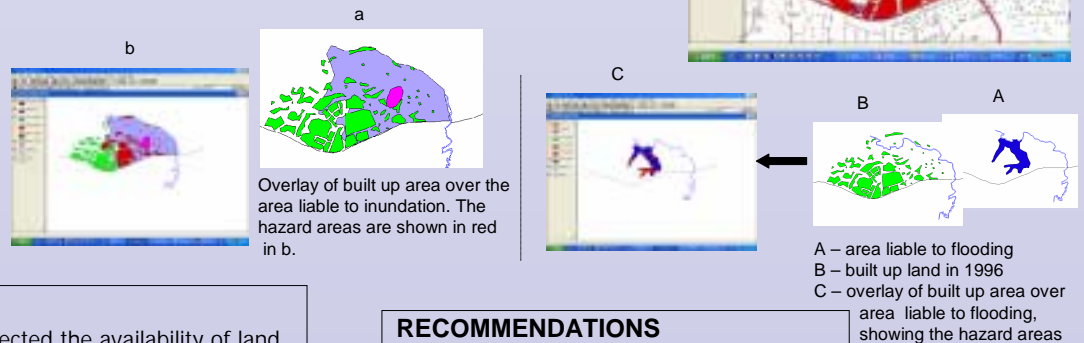


FINDINGS

1. Built up land is dominant: Residential use constitutes 60% and commercial use 24%.
2. The built up area increased from 5.5% between 1975-1986 to 25% between 1986-1996.
3. The expansion has spread into areas liable to flood and inundation. This presents potential flood and inundation hazards.
4. Lack of up to date data on the study area.
5. Inadequate institutional capacity to effectively monitor the development trend.

Analysis

Overlays of the identified land uses and features delineated provided results for discussion.



CONCLUSIONS

1. Rapid land use conversions have affected the availability of land for other uses; farmland, open spaces and natural reserves.
2. There are potential environmental hazards in times of heavy rains and over spill of the Densu River.
3. Weak institutional capacity to deal with the problem.
4. GIS provides an option to effectively monitor the development trend. There is a problem on accessibility to series of up to date data to facilitate GIS application.

RECOMMENDATIONS

1. Local level institutions responsible for land use planning and monitoring to be automated. This will facilitate remote sensing and GIS applications.
2. Effective cooperation and coordination amongst land sector agencies in the country.