DEVELOPMENT OF A WEB BASED LAND INFORMATION SYSTEM (LIS) USING INTEGRATED GIS TECHNOLOGY FOR AMPARA TOWN, SRI LANKA

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Introduction

The definition of LIS (Land Information System) implies that the spatially referenced land data stored in the database should be related to its ground location. In the Sri Lankan context of information system for sustainable development, the obvious choice of geographical location is the land parcel available in cadastral records. It is both easily locatable on a map and described in legal records. Such a land information system generated from the cadastral surveys will provide the information base for village level or micro level planning. The LIS will comprise of graphic elements derived from cadastral maps and non-graphic attribute data obtained from cadastral records suitably supplemented with additional information useful for planning purposes. In Sri Lanka, rapid urbanization is resulted due to the unprecedented population growth coupled with unplanned developmental activities.

The cities are like trees; both of them grow under natural limits. These limits affect in the formulation of a city's master plan (Mahrous, *et al*, 2002). In Sri Lanka, rapid urbanization is resulted due to the unprecedented population growth coupled with unplanned developmental activities. This urbanization, which lacks in infrastructure facilities, has posed serious implications on the resource base of the region. The urbanization takes place either in radial direction around a well-established city or linearly along the. The city of Ampara in Sri Lanka provides a typical case of haphazard and unplanned urbanization.

The data element (Landuse/landcover, infrastructure, drainage etc.) which has both static and dynamic components pose a formidable challenge for proper maintenance and operations in different sectors concerns. Due to development of automation in technological processes applied to data gathering, integration and processing of topographic details and their customized presentation, analysis and interpretation the challenges can be met with the help Desktop GIS system. While Geographical Information System (GIS) involves in integration of spatially referenced data in a problem solving, GIS-based Land Information System (LIS) is an interactive computer-based systems that help decision makers utilize data and models to solve unstructured problems. Combining both the ideas, in the present times such powerful software technology has been developed that allows virtually unlimited amounts of information to be linked to a geographic location. Coupled with a digital map, GIS records, stores, and analyzes information about the features that make up the earth's surface, thus allowing a user to see regions, countries, neighborhoods, and the people who live in them with unprecedented clarity (Betty, *et al*, 1998). In this study an integrated GIS based methodology is developed and successfully tested by generating an up to date digital database. Finally a Land information System (LIS) is designed for the urban development authorities.

The objectives of this study area are:

- To identify the urban sprawl by using geospatial data
- To know the growth pressure with land use and zoning regulations into perspective from available data
- To assist the decision makers in laying the foundation for the growth of the Ampara urban area
- To develop a Web based interactive Land Information System (LIS) for immediate and ready extraction of plot wise detailed information of the land.

Methodology

The methodology adopted in the study can be described in the following steps.

a. The map of Ampara urban and its surrounding areas is digitized. The Cadastral data comprises of the characteristics of the drainage network, road network and infrastructure facilities in the city.
b. Plot-wise urban land use map is prepared and attributes were assigned for every plot with full ownership and built-up information.
c. A Decision Support System has been created to acquire information regarding every plot with its all attributes.
d. The entire database is converted into a web supported format and is customized to provide query facilities for immediate and ready extraction of information through Web

Discussion and Conclusion

The city of Ampara is rapidly increasing in the recent years and the growth is found in the town. The infrastructure facilities are also growing in the city with its gradual expansion. The road network and the available infrastructure facilities found in the city. Land suitability map prepared using satellite data, which can provide a clear guidance to the Town planners for proper planning of the city in terms proposed construction.

The city of Ampara in Sri Lanka provides a typical case of haphazard and unplanned urbanization. Due to the unplanned growth of the city both in horizontal and vertical directions, there is a need for proper planning for the careful handling of this alarming situation. In this study an integrated GIS based methodology is developed and successfully tested by generating an up to date digital database. Finally a Land Information System (LIS) is designed for the urban development authorities in web based interactive supported format.

The following conclusions can be made from the above study:

1. The Integrated GIS methodology is found to be very useful in monitoring the urban growth of a thickly populated and rapidly increasing city like Ampara in Sri Lanka.
2. The GIS based Land Information System (LIS) provides important tools for the developers and planners to extract information of the infrastructure facilities.
3. This Land Information System (LIS) can be utilized in much larger cities anywhere in the world with the addition of more information and desired modifications.

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