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Geospatial Science for 16 Years of Variation in Land Use/Land Cover Practice Assessment around Salem District, South India

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Abstract The present study reveals that, to assess the Land use Land cover changes using remote sensing and GIS technology. The Land use/Land cover map prepared based on NRSC classification using ERDAS IMAGINE software using of supervised classification. Urbanization and development are the most crucial causes for land changes at the study area. The current scenario shows the socio-economic development but its affect the water resources, mineral wealth and ecosystems. The study finding shows that the maximum changes were noticed in Built-up-Land at central part of study area and near to down ship area. Other changes also were noticed in the study area and brought this spatial distribution.

Keywords: *GIS, land change, urbanization*

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1. Introduction

Due to the urbanization we are losing agriculture land, vegetation land, forests land, water bodies, and mineral wealth. These changes are the major issue for current events. Faridkhan et al. (2012) stated that land use and land cover change analysis are the important study in current planning keys for sustaining the natural resources and controlling environmental changes. Narayan chopra et al. (2011) revealed that land use and land cover inventories are useful for agricultural planning, settlement planning and surveys, environmental studies and management aspects. The advance development of Remote Sensing and Geographical Information System Technology helps an accurate measurement on land use land cover change studies. The present study has been conducted at Salem district in central part of Tamil Nadu, South India. The study region has adequate natural resources like good agricultural land and soil, Iron ore deposits, Magnesium ore deposits and Aluminum ore deposits. The main aim of the study is to compare 1992 to 2008 satellite data and assess the changes using remote sensing and GIS Technology. The objectives are to create land use / land cover map based on NRSC classification and interpretation of those changes.

2. Materials and Methods

2.1. Data Used

Survey of India Toposheet, 1: 50,000 scale, (1972-74).
Landsat imagery – (1992 and 2008).
ERDAS – image processing software.
Arc GIS software.

The following methodologies were carried out to assess the Land use / Land cover changes (Figure 1):

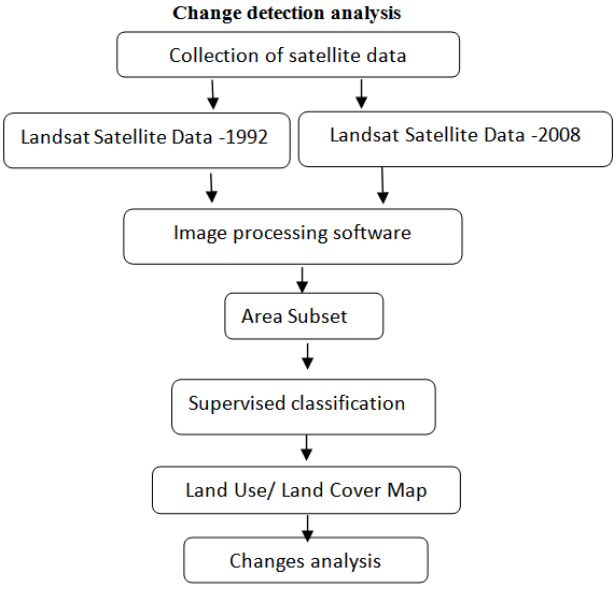

Figure 1. Flow Chart-Methodology

2.2. Study Area

The study area is located in between Latitude 11°39'52" and Longitude 78°8'45" and total area covered

by 5234km^2 (Figure 2). The average elevation is 278m (912ft). The study area bounded at north side of Nagaramalai hill, South side of Jarugumalai Hill, West side of Kanjamalai Hill, East side of Godumalai Hill,North East side of Shervaroy Hills and South West side of Kariyaperumal Hills. B.Gurugnanam et al. (2010) stated that the average rainfall of Salem district was less than 200 mm during 1998-2007. It was very less than actual rainfall. The actual rainfall of Salem districts is South West Monsoon545.8 mm and North East monsoon 564.2.

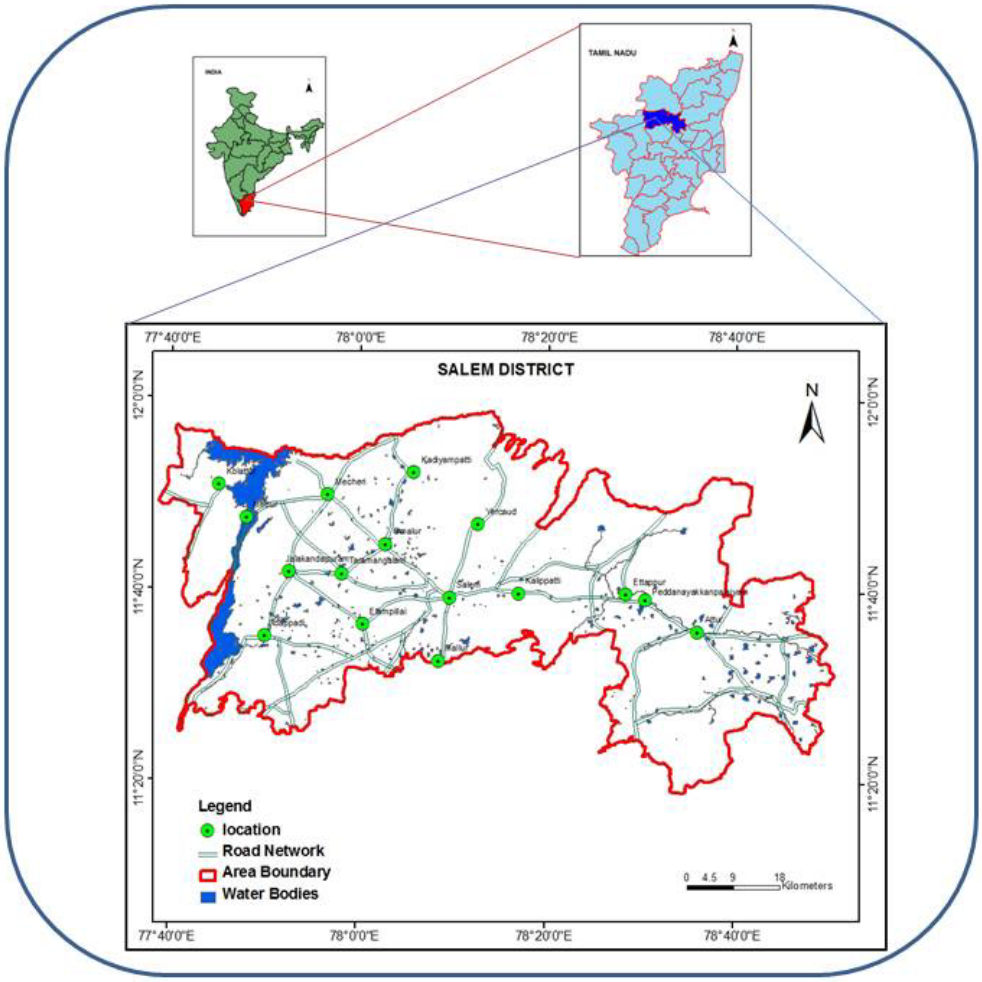

Figure 2. Study Area

3. Results and Discussion

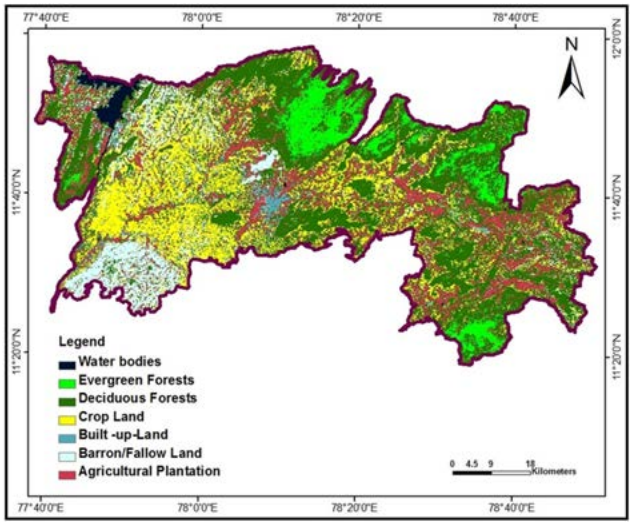

Figure 3. LU/LC-1992

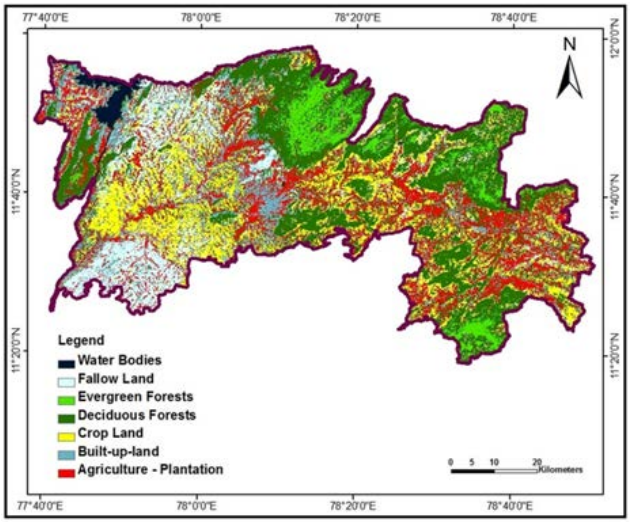

Figure 4. LU/LC-2008

Landsat TM 1992 and 2008 satellite data has been downloaded using www.landcover.org website. This image was taken into ERDAS image processing software

for preparing the Land Use/ Land Cover map (Figure 3, Figure 4). These maps were classified based on NRSC classification. These seven classes are Agricultural Plantation, Deciduous Forests, Evergreen Forests, Built–up-land, Fallow/Barron Land, Water Bodies and Crop Lands. The classified fields are clearly showsthe current scenario of the region.

The above maps are clearly shows the land use/land cover changes for the year 1992 and 2008. The comparative changes are given below (Table 1).

Table 1. Land Use/Land Cover changes in Salem Districts

Classification	Year 1992		Year 2008		Changes %
	Km^2	%	Km^2	%	
Deciduous Forest	2343	44.8	1778	34	10.8(-)
Crop Land	967	18.5	831	15.9	2.6(-)
Agricultural Plantation	790	15.1	930	17.8	2.7(+)
Built-up-Land	141	2.7	629	12	9.3(+)
Evergreen Forest	372	7.10	286	5.5	1.6(-)
Water Bodies	85	1.6	83	1.6	0
Barren/Fallow	536	10.24	697	13.3	3.06(+)

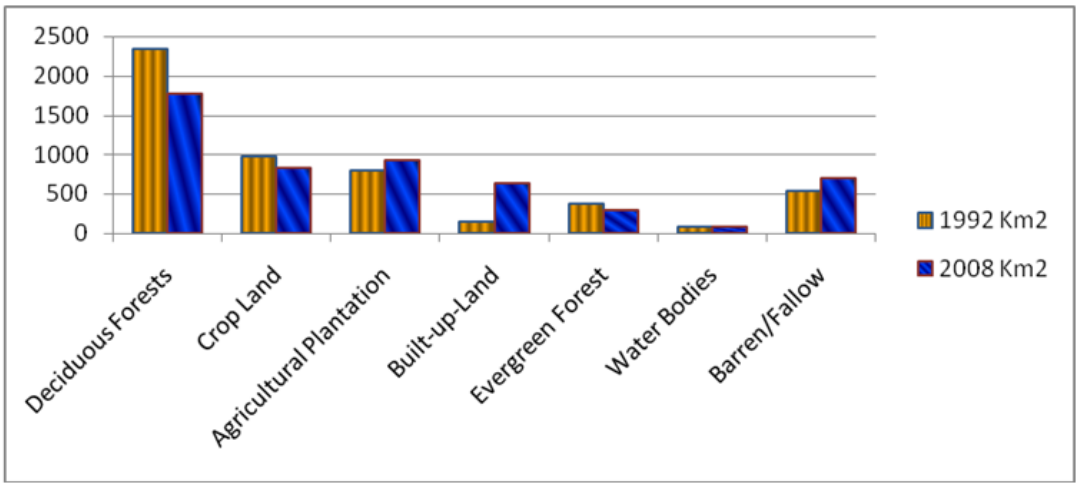

Figure 5. Chart shows the relative changes of LU/LC on 1992 and 2008

During the year 1992 to 2008 in-between 16 years interval the district faced the tremendous changes. The Built-up-land have increased and more dense in the central part of the district. Water bodies are changed with the reduction of 2 km^2 and dried out because of extinct of streams. And other classes of Deciduous Forest, Evergreen Forest, Crop Land, Barren/Fallow land and Agriculture Plantation changes are strewn around the study area.

Those changes were highlighted in below (Figure 6).

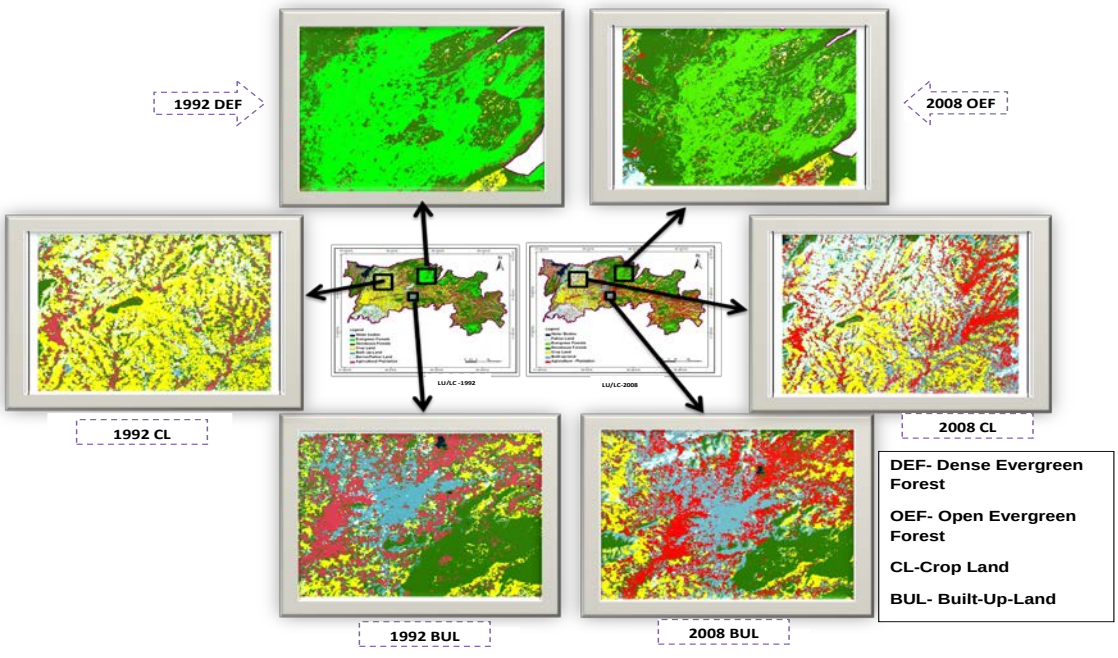

Figure 6.

4. Conclusion

Thestudy perfectly concluded that Deciduous Forest (10.8%), Crop Land (2.6%) and Evergreen Forest (1.6%) are relatively decreased. This is due to less amount ofrainfall. Agricultural Plantation (2.7%), Built-up-Land (9.3%) and Barren/Fallow Land (3.06%) are relatively increased. Human population and anthropogenic activities are the main causes for increasing built-up-land.

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