Cloud Publications
International Journal of Advanced Alternative Energy, Environment and Ecology
2012, Volume 1, Issue 1, pp. 36-38, Article ID

Review Article

Open Access

Modelling the Transformation of Land use and Monitoring and Mapping of Environmental Impact with the help of Remote Sensing and GIS

Raj Chandar Padmanaban

Department of Remote Sensing, Anna University of Technology Chennai, Regional Centre Tirunelveli, Tamil Nadu, India

Correspondence should be addressed to Raj Chandar Padmanaban, charaj7@gmail.com

Publication Date: 28 November 2012

Article Link: http://scientific.cloud-journals.com/index.php/IJAAEEE/article/view/Sci-52

Abstract The proposed research focus on the transformation of land use at regional level, diverse factor influencing land use changes and investigate on the environmental issues with the help of Geographical Information System. Now-a-days the population growth increasing speedily, in other hand destroying the nature also mounting swiftly because of providing superior life style to the society, the government and private sectors are mostly focusing on the urbanization and social changes but it's directly or indirectly affect the global level of the environment. Human interference on the agriculture land and deforestation leads to changes in the natural vegetation, ecosystem, habitat loss, climate changes, flora and fauna degradation, sea level raise and so on. In this research spatial modelling helps us to study about the past, present and future scenario of land use changes, variation in ecosystem, degradation of vegetation and forest, intrusion of wild life habitat, and extinction of terrestrial species, etc. The broader concept of urban growth modelling provide the detail of land cover/land use changes, growth or reduction of feature in area extract with the assist of Multiple Level Classification (MLC). In remote sensing technique, the various modelling achieve from the spatial and temporal elements obtain from aerial photos, satellite images and statistical information. The proposed research keen interest on the investigation on environmental changes and its impact, the diverse environment factor are analyses and modelling with the help of spatial data mining, gradient analysis and spectral enhancement.

Keywords *Spatial Data Mining, Spectral Enhancement, Gradient Analysis, Multiple Level Classification, Remote Sensing, Geographic Information System*

1. Introduction

Now-a-days the population growth increasing rapidly; in other hand destroying the environment; augmented for providing better life to the society; the basic need such as food, shelter, clothes and various products acquiring from natural environment. In order to fulfill our basic necessitate, the society obliterate the natural resources and polluting the environment. In development of remote

sensing and GIS, the monitoring of environment become trouble-free and periodically, this study helps to study about the changes in the environment due to human intrusion, deforestation and various pollution such water pollution, soil/ land pollution, air/ atmosphere pollution and so on. The objective of the present research is to study exhaustively the land use/ land change modelling and environmental impact. It is required to study the various processing and modelling techniques in remote sensing and GIS. The present research will suggest the system like Multiple Level Classification (MLC), Spectral Enhancement and Gradient Analysis. The purpose of the present work however may be confined as determination and modelling of urban growth level and categorize the area with the aid of spatial statistic methods, modelling of environmental impact due to urban growth and human interference and modelling the past, present and future scenario of land use changes, variation in ecosystem, degradation of vegetation and forest, intrusion of wild life habitat and extinction of terrestrial species, etc.

2. Outline of Methodology

The main goal of this research is to provide urban growth modelling and modelling of environmental impact due to urbanization and human interference. In this proposed research the new approach “Multiple Level Classification” (MLC) has been suggested to attain Level I (residential, population density, and natural system), Level II and III classification (urban land use change on the local/community level, socioeconomic variable) with the help of spatial statistics techniques and Cellular Automata [1]. Here spatial statistics primarily help us to discover the topological and geometric properties of an area. Thus the hierarchy level of classification helps to study about the past, present and future changes in environment and its impact. In this various environmental factor are extracted from spatial temporal and non-spatial temporal data. The diverse environment factor are analyse and modelling with the help of spatial data mining investigation, gradient analysis and spectral enhancement [2]. Field based spectral measurements combined with remote sensing platforms helps to monitoring ecosystem processes and sustainable land management. Spectral enhancement consent to dissimilar features that have exact reflective character in diverse bands of the electromagnetic spectrum to be compacted if statistics is comparable [3]. It also allows adapt of the pixels of a picture independent of the values of nearby pixels. The various level of analysis helps to correlate the features in spectral enhancement such principle component, decorrelation stretch, tasseled cap, RGB to HIS. Gradient analysis spectral reflectance properties of plants, soil, wood, aquatic sediments, chemical and biological agents, geologic substrate and other resources give comprehensive information about their position and composition [4]. When collective with remotely sensed imagery, data on the spectral characteristics of materials greatly enhances the capacity for large-scale and long term monitoring of environmental circumstances related to global climate change, pollution deposition, natural resource management and land use and other important ecosystem stressors.

3. Conclusion

This project mainly facilitate to study about the past, present and future changes in environment and its impact such land use changes, variation in ecosystem, degradation of vegetation and forest, Intrusion of wild life habitat and extinction of terrestrial species, etc. The keen interest of an environmental study gives awareness to the society about their environmental degradation and transformation of ecology. The field-based spectral measurements combined with remote sensing podium assist to monitoring ecosystem processes, sustainable land management, ecology study and environmental monitor. The study prove that the available remote sensing satellite such GOES, NOAA, AVHRR, IRS P6 and Oceansat can be processed with the help of remote sensing and GIS techniques be able to utilized for monitoring and investigate the natural environment. The planned various inspect on environmental changes and its impact, the diverse environment factor are

analysed and modelling with the aid of spatial data mining, gradient analysis and spectral enhancement.

References

[1] Al-Awadhi T., 2007: *Monitoring and Modelling Urban Expansion Using GIS and RS: Case Study From Muscat, Oman*. In Proceedings of Urban Remote Sensing Joint Event, Paris, France.

[2] Hall O., et al. *A Multi Scale Object-Specific Approach to Digital Change Detection*. International Journal of Applied Earth Observation and Geoinformation. 2003. 4 (4) 313-327.

[3] Chandrasekar N., et al., 2002: Remote Sensing and GIS in Coral Reef Environment- An Overview. Proceedings of the National Seminar on Marine and Coastal Ecosystems: Coral and Mangrove: Problems and Management Strategies, 2, 132-138.

[4] Sannier C.A.D., et al. *Real-Time Vegetation Monitoring with NOAA-AVHRR in Southern Africa for Wildlife Management and Food Security Assessment*. International Journal of Remote Sensing. 1998. 19; 621-639.