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Significant Changes on Land use/ Land Cover by using Remote Sensing and GIS Analysis- Review

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Abstract:
Remote sensing and GIS (geographical information system) assist real-time monitoring, mapping, identification and analysis of LU/LC patterns. GIS helps to generate different types of thematic maps for the planning, exploration, and management of natural resources determination of land use/land cover, monitoring of Agriculture, finding the location of the Barren land. This paper considers a review of distinct techniques for various applications of Remote Sensing and GIS and nd, detection of forest land, a collection of Drainage network and Urban sprawl. To integrate aspects of land use /land cover for determining changes can be achieved. The color indication of substances will help for quick determination of changes. To provide sustainable land use schemes, information of present land use distribution i.e., distribution of agricultural lands, barren lands and urban lands also their changing proportions from time to time for policy makers.

Keywords: Land use/Land cover, Urban sprawl, Drainage network, Natural resources.

I. INTRODUCTION

Land use and land cover are a consequence of geographic and socio-economic factors and their use by man for various activities in space and time. The land is a valuable resource; it is damaged due to various human activities urbanization, industrial development, and infrastructure development. Land use and land cover changes also have an impact on hydrology such as infiltration, evaporation, and runoff (Jamal Mohamed Salah Irhounah 2014). These activities have the major effect on the global environment change. For the sustainable use of the land, frequent monitoring of land use and land cover patterns are useful (Singh bijender et al., 2014). To improve or maintain the living conditions and standards land use data is required (James R. Anderson et al., 1976) Remote sensing and GIS (Geographical Information System) plays in important role in change detection of land use/ land cover helps in protection natural resources and maintenance (T Lakshmi Prasad et al., 2014). Digital datasets are used for the change detection in land use patterns; it contains satellite images and aerial photographs. These images covered the area in regular intervals of time so that we can analyze the change by visual interpretation. Managing of digital data is done with the help of remote sensing and GIS (geographical Information systems) (Singh bijender et al., 2014). To improve the capability of a decision making, the information system is useful. It includes many operations like planning the observation and collection, storing and analysis of data. A GIS is an information system that creates a platform to work with the reference of geographic coordinates. Mapping locations, thematic mapping, quantization, finding distances and real-time monitoring are the applications of GIS (Ramachandran et al., 1998)

Classification of Land use/Land Cover

Land use land cover is the source gives the information of geographical, network communication, and morphological changes. However, for the study of these modifications, there are many scientists and scholar developed the classification of land use land cover. We analyzed different parameters are given below

II. BUILD-UP LAND:

The increase in the population has significant pressure for construction of the buildings and land cover area (Yacouba Diallo et al., 2009). A Large change in Build-up land has a great impact on the environment.( Siva Prathap.T et al.,2015). Frequent observations on Built-up land are important for the sustainable growth of an area. Change in the built-up land can be determined by comparison with previous information with periodic intervals. (Singh Bijender et al., 2014) Urban land is conspicuous landscape on the earth affected by human exertion. Urban growth can be determined by detection of change by Build-Up land (Singh Bijender et al.,2014). Urban development, especially shifting of the residential and commercial area to a rural place, continuous shifting is considered as a sign of the vitality of the regional economy. With the rapid increase in the population and unpredictable growth in the urban area results in the unwanted change in the landscape (S. Olokeoguna et al., 2014). It is a natural phenomenon; urbanization includes construction, corporate sector, Institutes and goes down (Siva Prathap.T et al., 2015). Rapid urbanization is a sign for a reduction in the cropland, forest area, and water bodies. The existing technologies assist for the accurate change (N. Vijayakumar et al., 2015). The development depends on land and natural resource consumption resulting in damage to ecosystem and environment. Surrounding agriculture area and scrub land has a great impact on the growth of the urban area (N. Nagarajan et al., 2011). As one of the applications of Remote Sensing and GIS is planning and operation of decision those results in the effect of urbanization. Rather than taking effective decision for urban issues, presumptuous approaches should be adopted (Ajay D. Nagne et al (2013). Infrastructure are solely responsible for urban growth, it has a vital role in the complete growth of the community. It supports the urban economy. The
transportation network is an important and well-known sector for an increase of urbanization (Ajay D. Nagne et al., 2013).

III. AGRICULTURE LAND:

Agriculture is the essential source for many developed and underdeveloped countries to maintain food securities, crop production and economic development (Amol D. Vibhute et al., 2013). The satellite data is helpful to take decision for supporting crop and agriculture strategies. In this regard, land use and land cover data gives full information of increasing on the cropland, seasonal variation. Comparison of multispectral and hyperspectral image processing manner gives quick results of seasonal crop identification and classification (Shwetank et al., 2010). The advancement of vegetation mapping has influenced the reach on Land use and Land cover thus by delivering accurate results on agriculture, grasslands as they are precedents (T. Lakshmi Prasad et al., 2014). In India, unpredictable growth in the population combined with unexpected development results in an increase of urban land and reduction of agriculture land (Singh Bijender et al., 2014). Economic or physical factors related highly for change in land use in any forms. (Ch. Tata Babu et al., 2014)

IV. FOREST:

Forest plays an extremely important role to conserve environmental arrangement. It conserves the healthy environment by Nutrient cycle and also by separating the carbon through regulation of gasses. It also powers economy by the supply of food, fiber, timber. It helps in the improvement of the welfare of human society as well as supportive livelihood there are many Ecosystem services inbuilt in biodiversity. Consumption of forest resources as well as non-forest resources in a non-sustainable manner leads to the environmental degradation (Singh et al., 2002; Rai, 2009). Exercising land resources plays important role in forming the quality of life and economy of the country (N. Appala Raju et al., 2013). For activities like a change in detection, biodiversity conservation planning and to avoid a threat to flora and fauna, vegetation maps give vast information. Vegetation mapping is relevant in the context of regions like no sustainable shifting cultivation is available (Prabhat Kumar Rai, 2013)

V. WATER BODIES:

The organization of rivers, streams forms the Drainage pattern, it gives information on the regulation of rocks and its structure (Dusan Jovanovic et al., 2015). Management of water and land resources employ sustainable utilization of land and water resources with least effect on the resources and environment. (Jiya George et al., 2016) The coastal area in active and changing when compared with other areas. It is medium for inland and foreign trade. As Costal land is finite, sustainable development should be implemented. Coastal zone bear high importance due to concentrated population, emission of waste, natural resource degradation, and ecosystem productivity. Protection of coastal area by assuming stable production and growth. As the coastal area is non-renewable resource integrated sustainable development should be adopted. Some rules should be developed for the protection of the coast. The coast is also affected by natural disasters like a tidal storm, cyclone resulting in the loss of human and economy (B Sridhar et al., 2016).

VI. BARREN LAND:

Barren land is one of the natural resources. Information of barren land can be used for various recovery measures and for the implementation of social activities like a forestation, social forestry, and agroforestry. Estimation of barren lands depends on the unutilized land by a human being. The collection of information of barren land is done in a diplomatic procedure as there are no boundaries and structures for the barren land.

Table: 1 Descriptions Of Land Use And Land Cover Classes Lu/Lc

<table>
<thead>
<tr>
<th>S.no</th>
<th>Description-1</th>
<th>Description-2</th>
<th>Classes from NRC LULC50K Mapping Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Agriculture</td>
<td>Cropland</td>
<td>Kharif, Rabi, Zaid, Two cropped, More than two cropped</td>
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<tr>
<td></td>
<td></td>
<td>Plantation</td>
<td>Plantation - Agricultural, Horticultural, Agro Horticultural</td>
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<tr>
<td></td>
<td></td>
<td>Current Shifting cultivation</td>
<td>Current Shifting cultivation</td>
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<tr>
<td>3.</td>
<td>Forest</td>
<td>Evergreen / Semi evergreen</td>
<td>Dense / Closed and Open category of Evergreen / Semi evergreen</td>
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<tr>
<td></td>
<td></td>
<td>Forest Plantation</td>
<td>Forest Plantation</td>
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<tr>
<td></td>
<td></td>
<td>Scrub Forest</td>
<td>Scrub Forest, Forest Blank, Current &amp; Abandoned Shifting Cultivation</td>
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<tr>
<td>4.</td>
<td>Barren/unculturable/Wastelands</td>
<td>Scrubland</td>
<td>Dense / Closed and Open category of scrub land</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sandy area</td>
<td>Desertic, Coastal, Riverine sandy area</td>
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<tr>
<td></td>
<td></td>
<td>Barren rocky</td>
<td>Barren rocky</td>
</tr>
<tr>
<td>5.</td>
<td>Wetlands / Water Bodies</td>
<td>Inland Wetland</td>
<td>Inland Natural and Inland Manmade wetland</td>
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<td></td>
<td></td>
<td>Coastal Wetland</td>
<td>Coastal Natural and Coastal Manmade wetland</td>
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<tr>
<td></td>
<td></td>
<td>River / Stream / canals</td>
<td>Perennial &amp; Dry River/stream and line &amp; unlined canal/drain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water bodies</td>
<td>Perennial, Dry, Kharif, Rabi &amp;Zaid extent of lake/pond and reservoir and tanks</td>
</tr>
</tbody>
</table>
VII. CONCLUSION:

There are many scholars used in Remote sensing techniques for the land use land cover classification, identification, and analysis of many areas and regions. They were used for classification in five categories like a forest, barren, water bodies, build-up, agriculture (Table:1) in this paper we conclude that the changes of land use land cover the best determination by colors. When compared with satellite images of different years there is a decrease in the forest area due to rapid urban development, human activities, and uncertain natural calamities. The reduction observed by the comparison of maps which shows the decrease in the green color area. The increase in Build-up land affected forest. Urban development results in the environment deterioration; consequently, it reduces the space occupied by the vegetation, water bodies, and cultivation. Build-up land which is represented by red color has great change throughout the period. There is an increase in the agriculture land by the clearance of the forest and open scrubs. It is found there is a gradual increase in the light brown color portion in the map which indicates the growth of agriculture land. Reasons for the reduction in the drainage due to environment issues like the surface runoff and the temperature. This can be noted by the dark blue color of the images.

VIII. ACKNOWLEDGEMENT:

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IX. REFERENCES:


