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Land Use/ Land Cover Mapping Of Vemulawada Mandal, Rajanna Sircilla District, Telangana State Using Geospatial Techniques

[1]Srinivas Elakurthi and [2]Praveen Raj Saxena

[1]Research scholar, Department of Applied Geochemistry Osmania University, Hyderabad, Telangana

[2]Professor, Department of Applied Geochemistry, Osmania University, Hyderabad, Telangana State, India

Email: srinivase4@gmail.com

ABSTRACT

Land use and land cover have a direct relationship with natural qualities and procedures, including the profitability of the land, species decent variety, atmosphere, biogeochemistry and the hydrologic cycle. GIS and Remote Sensing are bit by bit turning into an incorporated innovation that is as a rule generally utilized in different applications. These two innovations are integral, as they are basically variations of the digital spatial data. They have turned out to be inseparably connected in numerous application fields. The display techniques systems for GIS and Remote Sensing data has significantly progressed within the previous two decades. Technological advances in image processing and visualization techniques have created show and interpretation mechanisms for the investigation all forms and sources of geological data. In the present examination, the land use and land cover mapping of Vemulawada mandal, in the district of Rajanna Sircilla, Telangana State has been carried out on IRS-P6, LISS-IV satellite image, on standard visual interpretation techniques. The identified land use / land cover features are deciduous forest, single and double crop, fallow land, gullied land, marine sand dunes, non-perennial tank, perennial tank, plantation, reservoir, main river courses, rural and urban built-up land, scrub forest and un-irrigated land. Maximum area is covered by Kharif (56.94%) followed by double-cropped (22.20%), Wastelands, Land-with-scrub (5.03%) and Deciduous Open Forest (4.71%). The other land use and land cover classes individually cover less than 10% of the Total Geographical Area (TGA).

Keywords: GIS, Remote Sensing, LULC, LISS-IV

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INTRODUCTION

Land is basic for human survival, since it is accessible for people with living space to satisfy every obligatory need of mankind like food and other raw materials which are used in the fulfilment of his needs and needs. Land factor is basic for human advancement. Land utilities like atmosphere, water, soil, geology are not approach on the earth; in these way different rural exercises of mankind are confined. The unrivalled increment in populace development has brought about the expanding requests for food, feed and asylum assets. This calls for level headed usage of the accessible land especially in a nation like India where agriculture is the main methods for employment for lion's share of individuals. Such investigations are central for future arranging and henceforth the investigation of its attributes is urgent in defining the administration and improvement plans. "Land use" depicts how a land package is being utilized. This has been identified with financial movement frequently it very well may be changed. Land spread indicates the changeless highlights, for example, water bodies, rockynobs and forest land lands, and so forth. This is pretty much a perpetual element and inside the land cover regularly land use may happens. Ex. agriculture activities in forest region, blundering in woods zone. Both the terms are connected, exchangeable, dynamic in nature, gives an exhaustive comprehension of the cooperation and relationship of anthropogenic actions by the environment.

Now a days, advanced geospatial advances like Remote Sensing, Geographic Information System and Global Positional System are an astounding tools for mapping the land use and cover and give exact data to comprehend the elements of land use because of human exercises. many specialists have completed the land use and land cover examination through visual or advanced translation of satellite information. Most extreme Likelihood method for mapping area use and cover of Ramnagar area, situated in the lower region zone of the Uttarakhand State and arranged into five distinct classes, viz. developed region, vegetation, agrarian land, water bodies and sand bar[10]. Landsat MSS, Landsat-TM and IRS-P6-LISS III satellite imageries to assess the land use/land cover changes with visual elucidation systems and the point by point examination conveyed for as far back as 36 years in the Nilgiris region of Tamilnadu

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State during the periods 1973-2009[5]. Land use and land cover categories can be delineated on remote sensing data on different scales for sustainable development of an area (Bishat et al, 1995, Brahmabhatt et al, 2000, Bansal, et al, 2008). In view of this, the general land use and land cover pattern of Vemulawada mandal was identified using these geo-spatial technology, area falls between Longitude of $78^0$909' to $78^0$777' E and $18^0$594' to 18^0 414' N.

Methodology

The land use and land spread guide is set up by receiving the interpretation techniques of the image in conjunction with collateral data, for example, Survey of India geological maps and statistics records. classification should be conceivable by using interpretation techniques and advanced arrangement utilizing any of the image processing software. For the present examination, ERDAS 2014 ver. Programming is used for preprocessing, correction, enhancements and masterminding the satellite data for evaluating and checking the fleeting changes in land use and land cover and land formative activities.

The imagery is interpreted and ground checked for rectifications. The last guide is set up after field check. flow diagram demonstrating the strategy got is given in the differing land use and land cover classes in the examination zone has been finished based on the NRSC land use and land cover request framework. Flowchart showing the Methodology received for land use and land cover.

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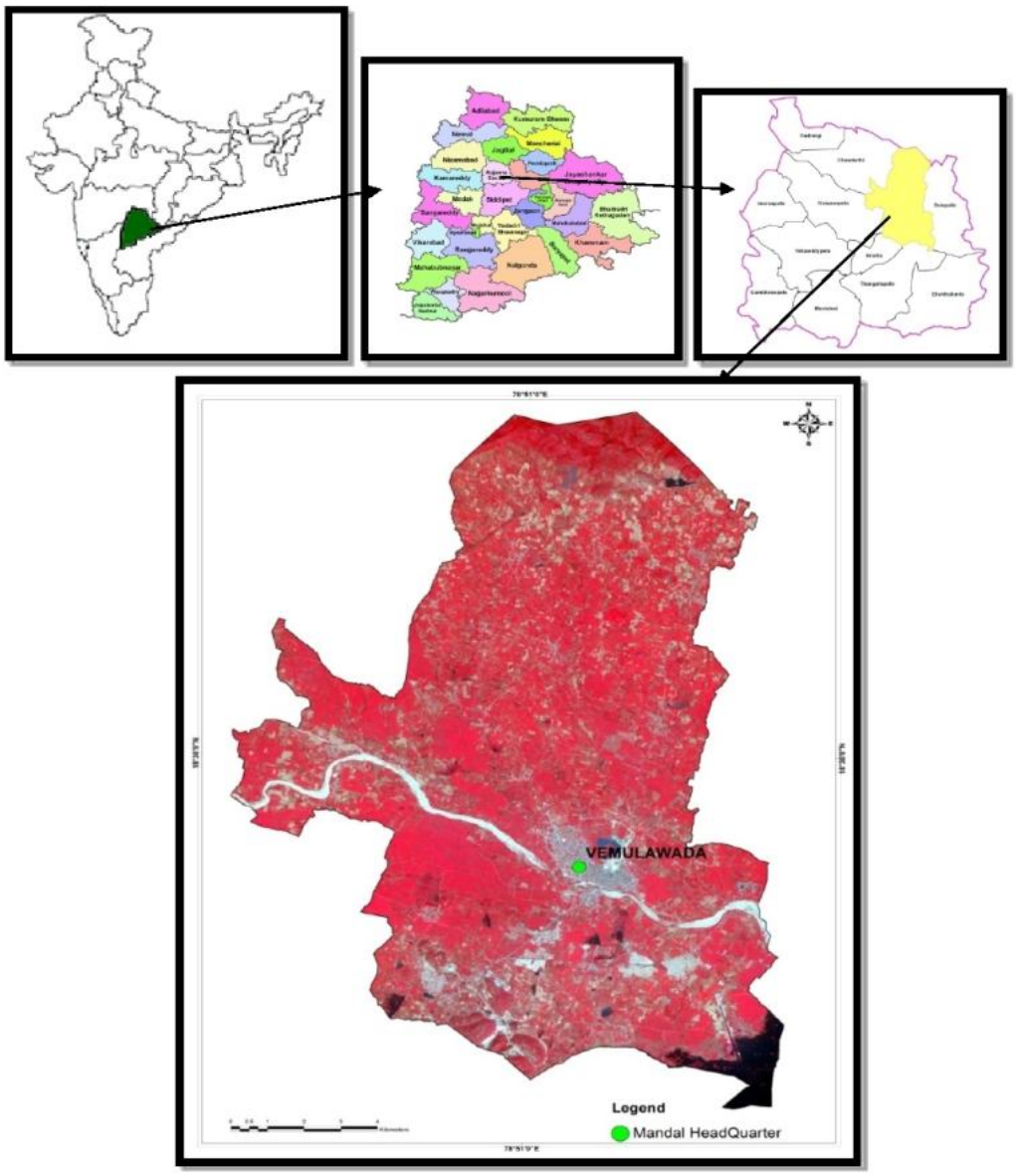

Fig. 1.1: Study area of Location map (as viewed on IR2A, LISS IV, 1st Nov, 2017)

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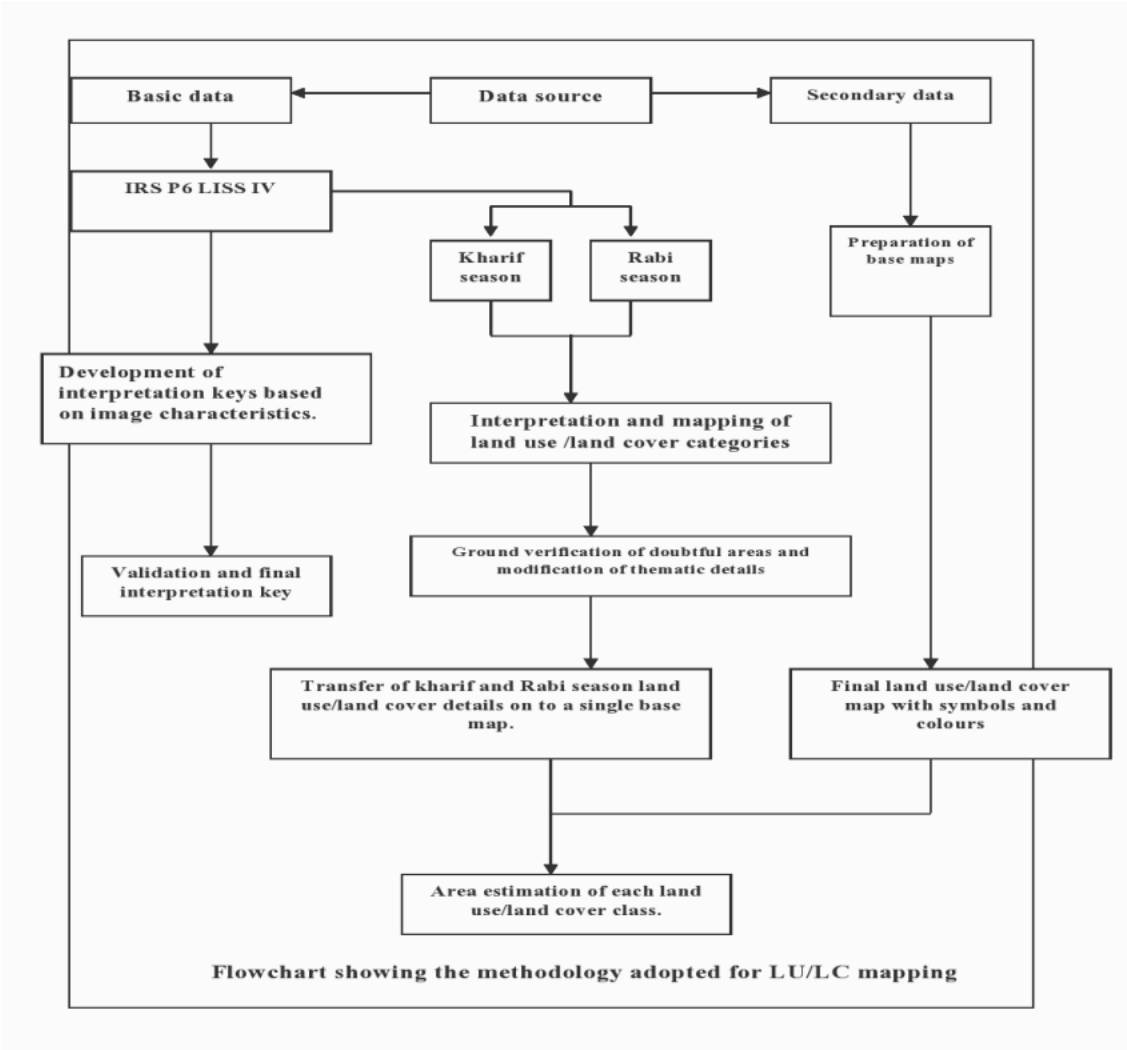

Flowchart showing the methodology adopted for LU/LC mapping

Results and analysis

In this study, seven land use and six land cover categories have been observed. The image interpretation elements for observing the above classes are given in Table 1.

Out of seven land use classes, single crop covers an area of 108.26 km2, followed by double crop 42.21 km2 etc. Similarly, major land cover category observed in the area is deciduous forest which accounts about 8.96 km2

Built-up land

It is a zone of human domicile created due to non-agrarian acts and exercises that has a cover of structures, transport and communication, utilities in relationship with water, vegetation and vacant terrains. The study area consists of urban, rural and

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transportation built-up lands in which rural built-up land covers an area 3.56 km2 (1.87% area of the study).

Water bodies

This classification comprises areas with surface water, either bounded in the forms of ponds, lakes and reservoirs or flowing as streams, waterways and channels. The study comprises of a number of water bodies which include tanks (3.17%) and Water-channel-area (3.29%) covering a total area of 6.29 km2.

Agriculture land

These are the terrains principally utilized for cultivating and creation of nourishment, fibre and other business and furthermore agricultural yields. The land was cultivated in Kharif as well as Rabi seasons which are suggested by the double crop areal extent of 42.21 km2 (22.2% of total study area). Single crop covers an area of 108.26 km2 (56.94% of total study area). Plantations are likewise present and are cultivated on a broad scale in a large contiguous area, owned and managed by an Individual or an organization. About 1.25 km2 area which is 0.66% of the total study area is under plantations.

Table 1: Shows Landuse and Land Cover statistics

Land use/Land cover type	Area in sq.km 2017	% of area 2017
Current-Fallow	0.2	0.11
Deciduous Dense/Closed Forest	0.71	0.37
Deciduous Open Forest	8.96	4.71
Kharif	108.26	56.94
Kharif+Rabi(double-cropped)	42.21	22.2
Plantation	1.25	0.66
River-Island	0.29	0.15
Tank	6.8	3.17

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Villages(Rural)	3.56	1.87
Wastelands, Land-without-scrub	1.09	0.57
Wastelands, Land-with-scrub	9.56	5.03
Wastelands, Sheet Rock	0.41	0.22
Wastelands, Stone-waste	1.39	0.73
Water-channel-area	6.26	3.29
Total Area	190.13	100

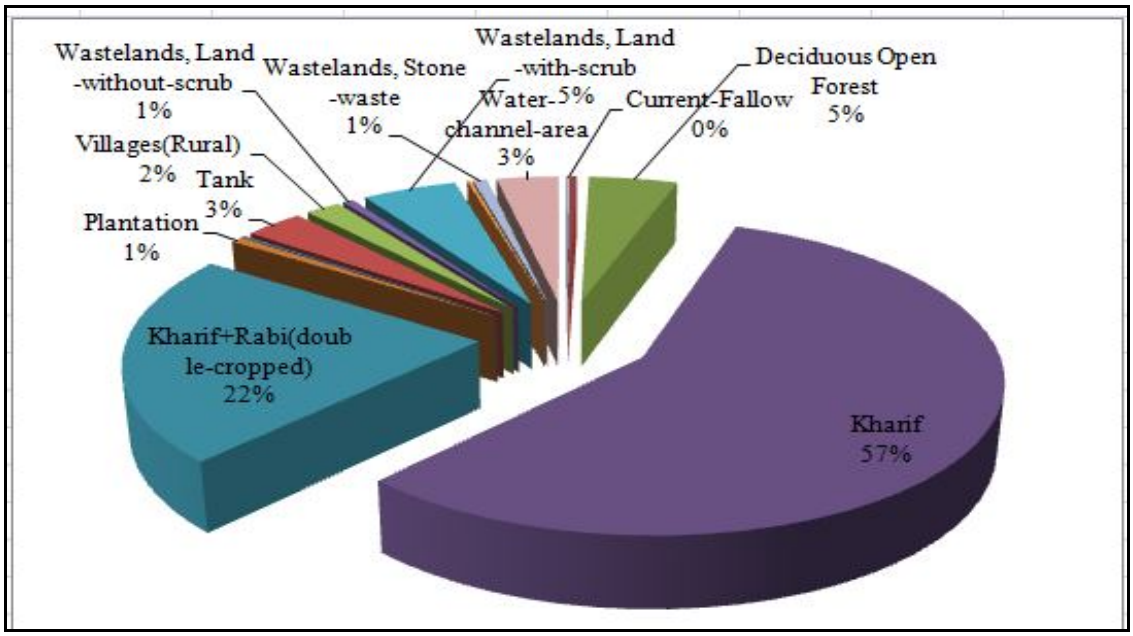

Fig.1:Pie Diagram of the study area

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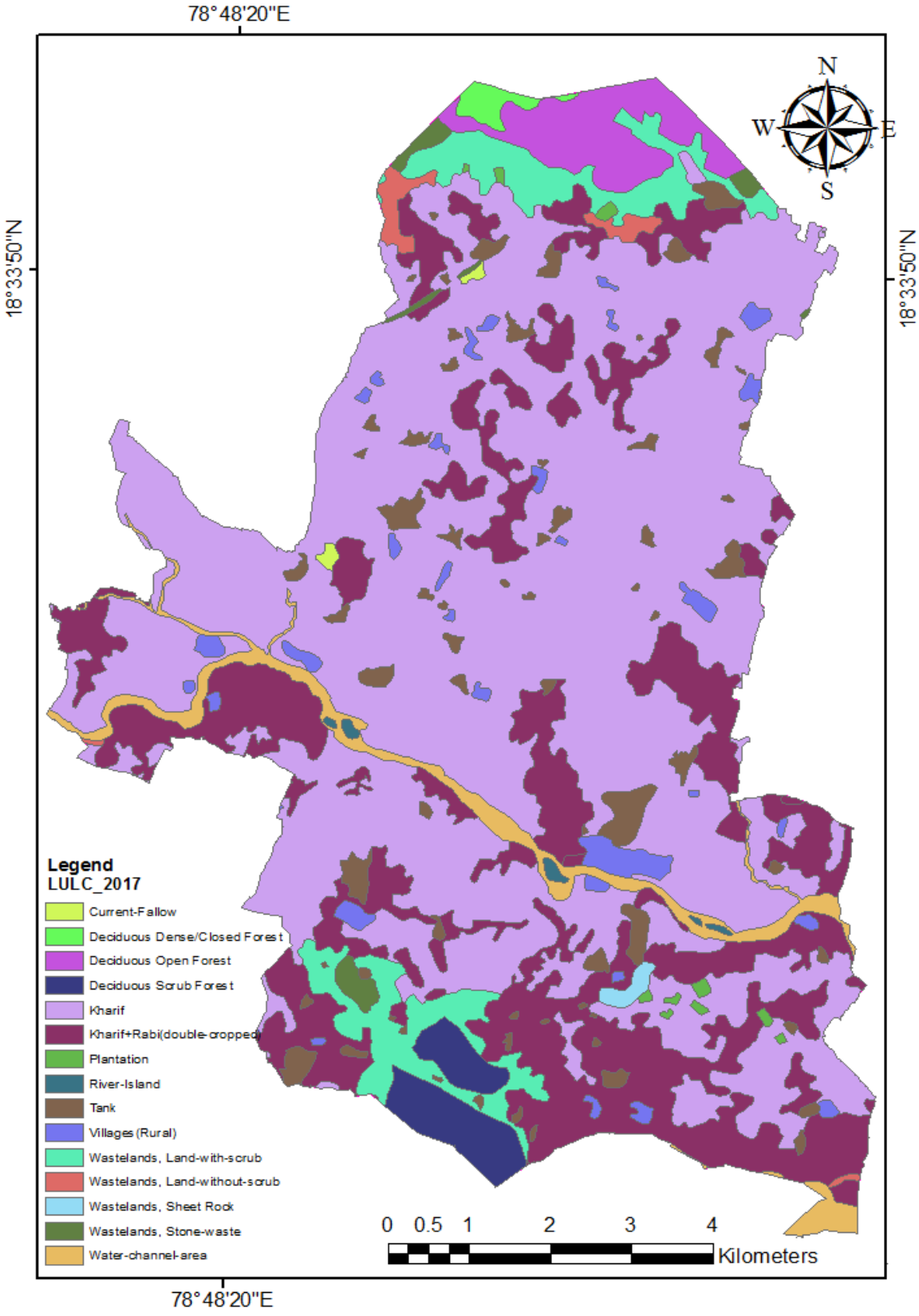

Fig.1.2: Land use /Land cover

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CONCLUSION

In this paper, the area of investigation has been divided into eleven Land use/Land cover categories in Supervised Classification. the major land use categories are double crop, single crop, un-irrigated, gullied land, etc. The major land cover classes are deciduous forest, plantation, scrub/degraded forest, tanks. The study area has built-up land about 3.56 km^2 covering 1.87% of the total area.

REFERENCES

[1] Chauhan, H.B., and Shailesh Nayak (2005). Landuse/Landcover changes near Hazira region, Gujarat using Remote Sensing Satellite Data, Journal of the Indian Society of Remote Sensing, Vol 33, No 3, pp. 413-420.

[2] Rao, D.P., Gautam, N.C., Nagaraja, R. and Ram Mohan, P. (1996). IRS-IC application in land use mapping and planning, Current Science, Vol 72, pp. 165-190.

[3] Ramprasad Naik, D., Appala Raju, N., Jagadeeswara Rao, P., Chandrasekhar Rao, T. (2015) Land Use/Cover Mapping of Paderu Mandal of Visakhapatnam District, Andhra Pradesh Using Geospatial Techniques, International Journal of Remote Sensing & Geoscience (IJRSG), Vol 4, No 6, pp. 23-28.

[4] Balaselvakumar, S., Kumaraswamy, K., Srileka, S., Jawahar Raj, N. (2003), Application of Remote Sensing Data For Land Use / Land Cover Mapping A Case Study of Arjuna River Basin, Tamil Nadu, Biosciences, Biotechnology Research Asia, Vol 1, No 1, pp. 43-48.

[5] Wawale Surindar, G., and Aher Aankush B.(2005). Land Use / Land Cover Mapping using Remote Sensing Data in Pravara River Basin, Akole, Maharashtra, India, International Research Journal of Environment Sciences, Vol 4, No 9, pp. 53-58.

[6] Skidmore, A.K., Witske Bijker, Karin Schmidt and Lalit Kumar (1997). Use of remote sensing and GIS for sustainable land management, ITC Journal, Vol 3, No 4, pp. 302-315.

[7] Merolla, Sivia, Mesto, Griseda, Calvanese and Gustavo (1994). A GIS application for assessing agricultural land, ITC Journal, Vol 3, pp. 264-269.

ISSN:0971-1260
Vol-22- Issue-14-December-2019

[8] Patel, N.K., Saxena, R.K., and Ajay Shiwalkar (2007). Study of Fractional Vegetation Cover using High Spectral Resolution Data, Journal of the Indian Society of Remote Sensing, Vol 35, No.1, pp. 73–79.

[9] Alaguraja, P., Durairaju, S., Yuvaraj, D., Shekar, M., Muthuveeran, P., Manivel, M., Thirunavukkarasu, A. (2010). Land Use Land Cover Mapping- Madurai District, Tamil Nadu, India using Remote Sensing and GIS Techniques, International Journal of civil and structural Engineering, Vol 1, No. 1, pp. 91-100.

[10] Dhrub Kumar Dwivedi (2016). Globalization and Its Effects on Indian Economy, International Journal of Advanced and Innovative Research, Vol 5, No 11, pp.26-28.

[11] Tulli Chandrasekhara Rao, Jaisankar, G., Aditya Allamraju, Amminedu, E. (2018). Land Use/ Land Cover Mapping for Janjhavathi river basin of Odisha and Andhra Pradesh using Geo-Spatial techniques, International Journal of Engineering, Science and Mathematics, Vol 7, No 3, pp. 171-177.

[12] Surya, S and Hari, N. (2018). Diversity analysis and present status of Mangroves from Kerala, West coast of India, International Journal of Advanced and Innovative Research,

