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Geospatial Change in Peri-Urban Area of Bilaspur City, Chhattisgarh, Central India

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Abstract

Healthily environment is a suitable site for the settlement of all species, and resourceful land provides the most suitable land for their survival, so we can say that land is one of the essential resources for human beings. After the "Liberalization, Privatization, and Globalization" (LPG) reforms, larger urban areas of the world, as well as in India (1991) are rapidly expanding towards the countryside with the growth of population and development of urban functions that caused drastically change in the land use land cover pattern in Peri-urban or rural areas. Urban population continuously grows in its per-urban and rural-urban areas for settlement and economic purposes on the coast of natural resources. In this scenario, the city grows not only the human population but also changes its characteristics of spatial distribution. The land transformation from a natural to a cultural landscape is a process and cannot be Stopped with economic development, but it can be regulated by Governmental policies and planning. The ongoing changes in the urban periphery are linked with the Conversion of land use transformation from agricultural-rural to mixed-use urban area. In central India, there are many cities having an unsettled mass population on the coast of Per-urban vegetation, water bodies, agricultural area, and fallow land. The researcher chose the Peri-urban area of Bilaspur city for identifying the historical, cultural, socio-economical, and administrative center; Bilaspur is one of the important cities of Chhattisgarh state, which is characterized by manifold urban functions as the hub of commercial, industrial, educational, and medical institutions as well as governmental setups. The Geospatial changes took place in the peri-urban area of the city during the study period of the last 20 years (1999-2019). The changes in land use/ land cover are marked through the maximum likelihood supervised image classification method of high-resolution 30-meter satellite imageries of Landsat 1999 and 2019 using Arc GIS 10.7. The peri-urban area of the city is characterized by the newly built-up residential areas, the establishment of agro-processing industries, academic and research institutions, medical institutions, industries, and coal dumping sites in vast open and cultivated land. Hence, the Peri-urban area of Bilaspur city became a highly dynamic and contested zone with the emergence of a peculiar pattern of land use in the rural landscape. Therefore, such changes in land use/ land cover negatively affected the environmental conditions in the area with the shrinking of open and cultivated land, water bodies, and

vegetation cover. Thus, the paper is an attempt to analyze the recent changes in land use/ land cover and their effects in the per-urban environs.

Keywords; *Peri-Urban area, Land use/Land Cover change, Geospatial techniques, Central India*

Introduction

Land is one of the most important natural features for the existence of all living things. India is one of the second most populated and developing countries in the World's, and its transformation in all areas of the country is continuous going on. Progress of all Countries depends upon proper land use policy and management. India has thousands of cities which are classified into 6 groups on the basis of population. Its population of 35% (480 million out of 1360 million) settled in urban centres, but it still retains 12% of the world's urban population (WorldOmeter, 2018). In terms of number, without access to the basic functional facilities, it shows a very large but mainly 65% population still residing in the rural area. So, for better lifestyle and opportunities, migration here accrues at the vast level from village area to urban area. The current study shows that the Bilaspur city has more than 4 lakhs population both grown and transformed in 20 years with 30% decadal population growth rates have been recorded in 2019. The City infrastructure is the best reducer for citizens' common issues, but communities still face a shortage of usable services due to immigrant overloads. In the outer area of the city, everybody is looking for a certain and simple solution to solve their necessity, which is accessible on the low coast. The low capital land area attracts small start-ups and offers vast quantities of inexpensive land. These are all processes taking place very rapidly to run and compete with other developments, following the growth of this metropolitan area in the outskirts of the city. It's called Urban Sprawl, too. Unplanned expansion of metropolitan peripheral areas with low physical development density and non-existence of basic infrastructure, typically outside the urban area. Physical development of the fringe region is essentially a 'mono-centric model,' depending on the spatial arrangement of urban areas, on the trade-off between the rent of land and the availability of cheap daily commuters. Dramatic changes in land use patterns have contributed to land use and land cover (LU/LC). The total area for Bilaspur periphery for as per new data of "Bilaspur Municipal Corporation" (BMC) has shown an increase in 2011 from 357 km^2 to 839.16 km^2 in 2019. The total area demarcated for residential purposes is expected to increase as new residential layouts are coming up. Last decade Bilaspur is becoming a popular destination for medical purposes. Multi-specialty health facility located at Gol Bazar and Lingyadih. The health infrastructure of Bilaspur also includes the Chhattisgarh Institute of Medical Sciences and New Horizon Dental College and Research Institute, Trivedi Dental College, Mark Hospital, Vandana Hospital, AARBEE College of nursing and Laxmichand Institute of Technology. Besides these institutions, the following others private nursing homes and diagnostic centers are also located in Bilaspur.

The population growth rate of Bilaspur is very high among the other cities of Chhattisgarh; over 5 lacs of population have risen over the last two decades due to heavy immigration from neighbouring districts and other parts of the state. The creation of mixed-use open space between urban circles and rural agricultural spaces must be modified by unequal growth and rapid urban expansion (Khan, 1994).

Urban areas are increasingly shading outward in the rural landscape, which is the cause of the emergence of a peculiar pattern of land use in the peri-urban region of the city of Bilaspur, such interdependencies of settlement ties focusing on economic, social-cultural and environmental conditions and their implications on both sides of the border. In general, land use land cover is often transformed mainly by direct human uses such as agriculture and livestock raising, forest harvesting and management, urban or suburban construction and growth that have altered the world's vegetation area. Since the strategy of liberalization, privatization and globalization has been embraced by India since 1990, data on land has been included in the census. The morphology of settlements holds in both urban and rural areas along the highway and industrial patches.

Literature Review

Studies literatures, one could conclude about usage of Peri-urban land in a descriptive way. The term Peri-urban is very dynamic for rapid urban expansion in outskirt the administrators or policy planners have to go through a lot of evidences and real scenarios to formulate strategies for the land usage in Peri-urban areas. It is used in three different categories to express like a near place of city, process of conversion and a concept for expansion (Narain & Nischal, 2007).

The most important agenda for the stakeholders is to preserve the existing natural resources and provide the basic amenities to the residents of such areas. These areas must not be considered as plain subordinate land but should be given utmost priority as they are the future of upcoming big cities giving rise to various opportunities for many people. Townships are getting planned in the outskirts of metro cities and these are giving rise to the relocation of a huge population (Jana & Sarkar, 2018).

The Peri-urban land is exclusive in nature and is worthy of a unique way of approach for strategizing the methods of land usage for the betterment of the people residing there. The metro cities have the ability to grow rapidly and they also have the advantage of changing their own limits. As a place based it is the rural-urban fringe and transitional zone around the city characterized with intense interaction between linkages with rural and urban zones (Shinde, 2010).

It is the mixed zone and geographical area where rural meets with the urban facility. In terms of concept-based meaning, the vicinity of the zone to urban centers is less significant; it is the co-existence both of rural and urban characteristics (Ia quinta, D. & Drescher, 2000).

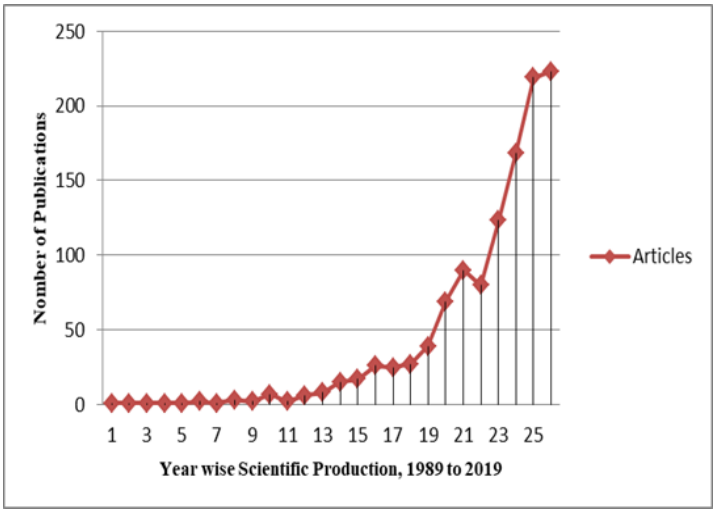
Whereas as a continuous process it is the transition of rural to urban areas as well as the flow of goods, services and resources between the urban and the rural areas (Narain & Nischal, 2007).

Transformation is a developmental process, which is a characterized by change in physical and spatial change pattern of land use land cover.

Meta-data-analysis was also used in this study to make literature review more scientifically meaningful. The following results were obtained on the basis of meta-data-analysis during the 1989 to 2006 period, Scopus database was used to get this result, the following keywords were used to search the database “Geospatial Change in Peri-Urban Area land use land cover”.

Table 1.1: and **Line Graph-1.2:** Data table and Diagram showing the Annual Scientific Production of Peri-Urban Related Documents till 2019

Sl. No.	Year	Publication of Articles	Sl. No	Year	Publication of Articles
1	1989	1	14	2007	15
2	1991	1	15	2008	17
3	1992	1	16	2009	26
4	1995	1	17	2010	25
5	1998	1	18	2011	27
6	1999	2	19	2012	39
7	2000	1	20	2013	69
8	2001	3	21	2014	90
9	2002	2	22	2015	80
10	2003	7	23	2016	123
11	2004	2	24	2017	168
12	2005	6	25	2018	219
13	2006	8	26	2019	223



Source: Review metrics Analysis through Scopus Data of 2019, analyzed by MS Excel.

Study Area: Location & Extension

Bilaspur city region is famous multi-functional hub and main administrative center in the all ruling periods in Chhattisgarh. Bilaspur city is the reputed largest administrative center; it is also a district and the divisional headquarters of Chhattisgarh State. Bilaspur Municipality was established in the year 1867 and later upgraded to the Bilaspur Municipal Corporation (BMC). The municipality covers an areas 255 sq. km and master plan developmental periphery is 463.27 sq. km while the expanding zone is beyond these limits and extended between 21˚56'N to 22˚12'N and 82˚00'East to 82˚16'. The main city is situated on the right bank of the Arpa River while recent development takes place in the left bank that is connected by the bridges. Bilaspur city is nodal point, which is well linked with the various significant cities of surrounding region and the country by roads and railways. Now provides employment opportunity in different sectors, hence people from various parts of the state & country attracts to get such benefit to improve their economic conditions and to fulfil needs of lifestyle.

Location Map of Study Area

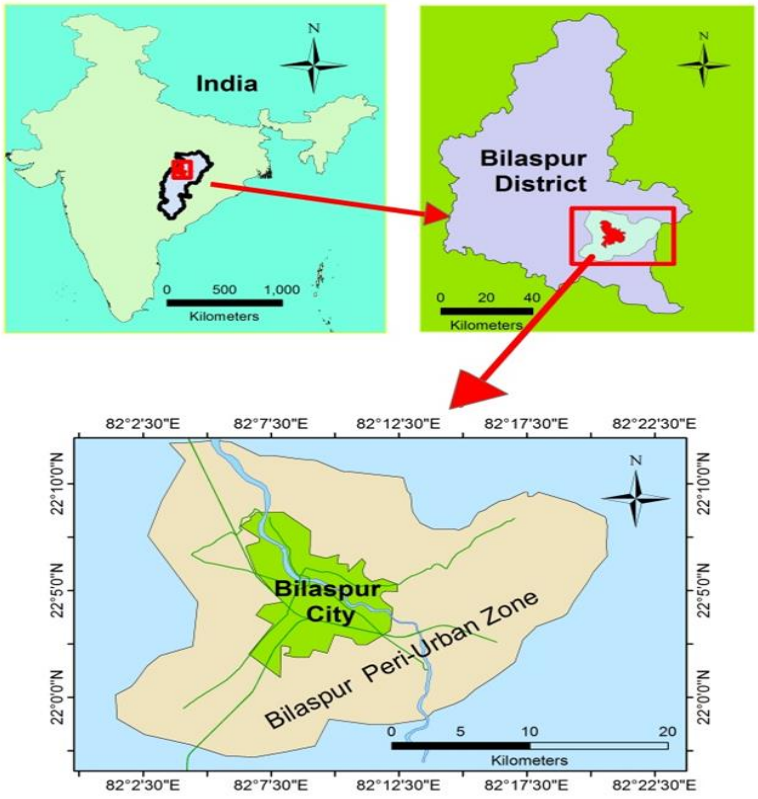


Fig.1.3 Source: Sattelite Imagery processed by Arc Gis 10.7.1.

Objectives

1. To study the Geospatial pattern of land use in the Peri-urban area of Bilaspur city
2. To analyse the changing pattern of land use in the Peri-urban area of Bilaspur city

Data & Methodology

This Geospatial study is based on secondary data sources and also uses primary data for the observation of the study area. Secondary sources are used to gather all imageries for the next processing of the study area; it also includes various other sites for visible accuracy. For this research paper, I have taken LANDSAT Satellite Imagery of the surrounding area from available resources (USGS, Earth Explorer Website). The LANDSAT Satellite Imagery is the source of Geospatial data to explore the characteristics of land use land cover. Google Earth Satellite Imagery is used as a reference to Data for the Land Use/Land Cover Classification of study Area. In this study satellite data collected from two geographical seasons' of India with less than 10% cloud available in May and November that is 1st Pre-monsoon and 2nd Post-monsoon for the suitability and identify the actual LU/LC of vegetation cover, water bodies and agricultural land.

LANDSAT-8 OLI Satellite images are collected for the months of May and November 2019; while the available imageries of LANDSAT-7 ETM+ are taken for November 1999 and May 2000. Additional information is collected from the study area by the field visit. The study is basically based on the supervised classification of LANDSAT satellite images having a spatial resolution of 30 meters. Firstly band composite of Images were

prepared and false-colour composite images were classified with the help of sufficient training samples for each class. Land use Land cover classification, detection and results based on post-classification method on the basis of visual interpretation and monitoring of the process of urbanization in the city from 1999 to 2019. Areas of different classes of the different time were calculated and maps were prepared by the output Data.

Land transformation was analyzed by overlapping study area polygon layers of four different time periods in ArcGIS 10.7.1 in order to recognize the conversion of one land use category to another type. The rapid changes of land use / land cover area classified as Vegetation, Water Body, Crop Land, Fallow Land, Built-up Area, and Coal Dumping Site. In the study area, there are identified maximum changes in Built-up area as Residential, Industrial and Institutional sector on the cost of Forest, Wetland and agricultural landscape, etc., but Owing to The Changes appear in this zone highly complex., such as the Built-up land and Coal Dumping sites increasing and the emergence of built-up areas in the open land, which cause many environmental changes, including the livelihoods of the inhabitants.

This research paper discusses and analyzes the recent changes in land use / land cover and their effect on human life in Bilaspur city's Peri-urban region. The land use / land cover area classified as Vegetation, Water Body, Crop Land, Fallow Land, Built-up Area, and Coal Dumping Site. Owing to the rapid change of land use highly complex. The Changes appear in this zone, such as the Built-up land and Coal Dumping sites increasing on the cost of Forest, Wetland and agricultural landscape, etc., and the emergence of built-up areas in the open land, which cause many environmental changes, including the livelihoods of the inhabitants. Rural landscape which is the cause of the emergence of a peculiar pattern of land use in the Peri-urban region of the city of Bilaspur.

The present Geospatial study of the peri-urban area of Bilaspur City is based on the latest geospatial techniques, such as Remote Sensing and GIS, which is an effective methodological tool used in this study. The mapping of the land-use pattern of two consecutive periods of the Peri-urban area is based on topographical sheets, Landsat imagery and field observation.

Fig. 2. A. Supervised clasification of Landsat imegeries for identifiing the Land Use/Land Ccover of Bilaspur Peri Urban Region (1999-2000)

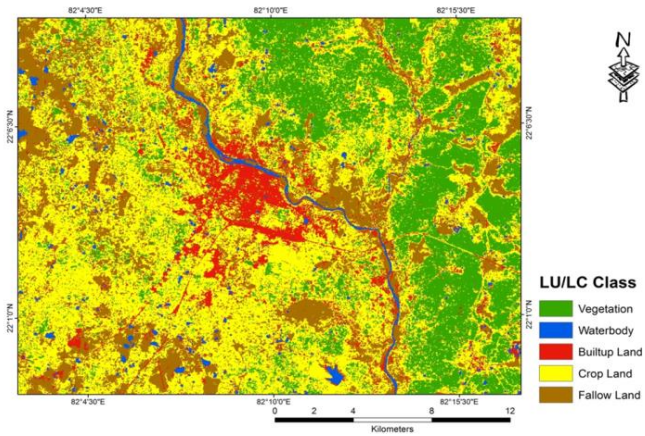


Figure 2.A.1: Plate showing the LU/LC pattern of Study area in November 1999.
Source: LANDSAT-7 Imagery, USGS.

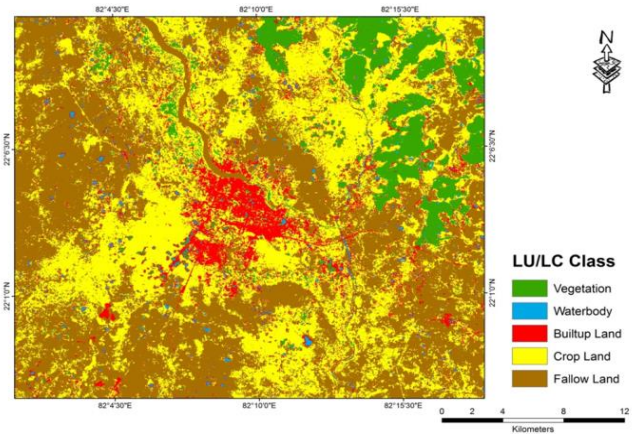


Figure 2.A.2: Plate showing the LU/LC pattern of Study area in May-2000.
Source: LANDSAT-7 Imagery, USGS.

Fig. 2. B . Supervised clasification of Landsat imegeries for identifiing the Land Use/Land Ccover of Bilaspur Peri Urban Region (May-2019 and Nov-2019)

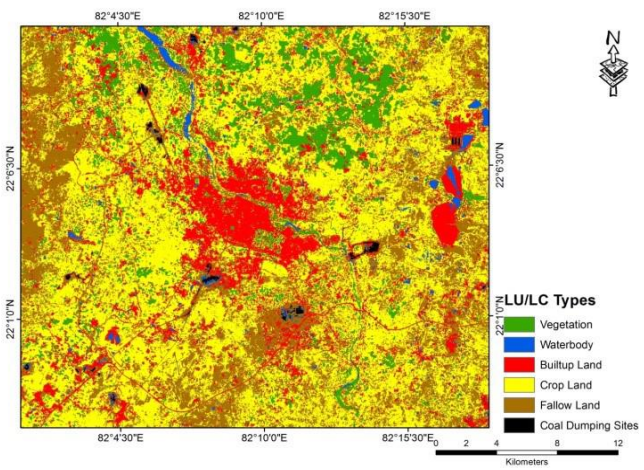


Figure 2.B.1: Plate showing the LU/LC pattern of study area in May 2019. Source: USGS, LANDSAT-7 Imagery

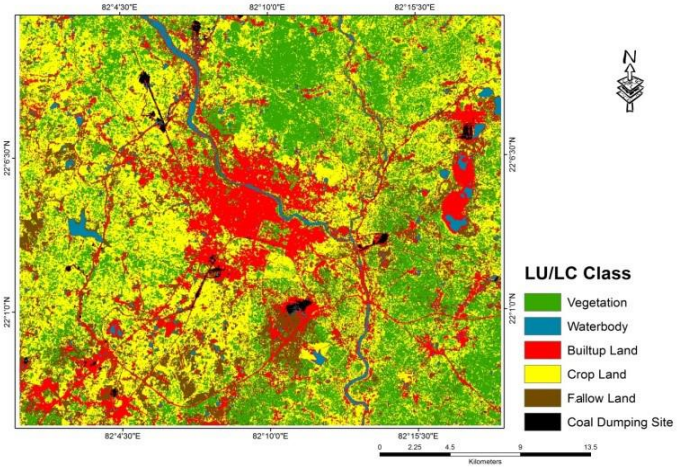


Figure 2.B.2: Plate showing the LU/LC pattern of study area in November 2019. Source: USGS, LANDSAT-7 Imagery

Fig. 2.C. Geospatial Transformation of Land Use Land Cover Pattern in Peri-Urban region of Bilaspur City (1999 to 2019**)**

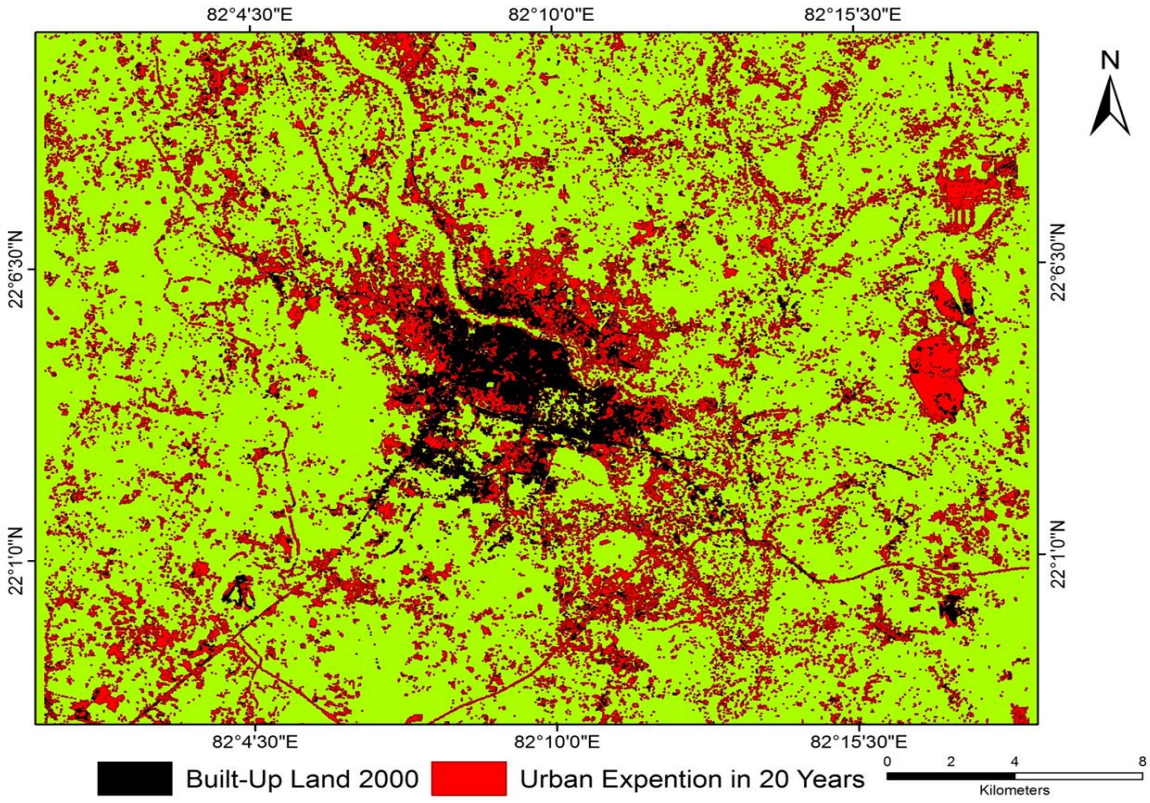


Fig. 2.5: plate showing the LU/LC pattern and Transformation of Study area within 20 years.(1999-2019) Source: USGS, LANDSAT-7 and I LANDSAT-8 imagery

Result and Discussion

The Land Use/Land Cover change pattern of Bilaspur Peri-urban area and its change between 1999 and 2019 through GIS and remote sensing. The Land-use pattern of Bilaspur city is shown in the LU/LC fig. 2.a. 1and 2 A. 1 and 2, and B 1 and 2. Pictures are showing major land use categories, and it has been classified into six types as

Vegetation, Built-up land, fallow land, Water bodies, Cropland, and Coal dumping site after the establishment of NTPC-Sipat in 200. There are major natural key features of LU/LC is Vegetation, agriculture land, water bodies, and fallow land.

All LU/LC classes happened on this area, built-up and coal dumping sites are newly expanded and engulfing Peri-urban vegetation, agricultural, fallow land. Sometimes make new check dams, ponds, and water reservoir the eradication of water scarcity and provides water facility to the settlers of urban localities. Needs more Coal dumping sites near the rail and road to dump their coal and asses for generating electricity with other activities.

After all these human work done for good environment and sometimes for survivals. These all 5 plates of Landsat imagery is divided into six categories for the representation of LU/LC data of study area. According suitable time period of imagery data taken and showing changes between Trans change and interchange. Through the Table: 3.1, all data are divided 2 main decades, 4 months of two seasons and classified into twelve groups on the basis of understanding of Lu/Lc change pattern. Table Results are giving clear-cut figures of Land covered by Vegetation, water bodies, and agricultural land, these thrice are varies from season to season and month to month (May to November).

Table: 3.1. LU/LC Report of Bilaspur Peri-Urban Region (Area in sq.km and (%)

SL No.	LU/LC Class	November-1999		May-2000		May-2019				November-2019			
		Area (Km2)	Area (%)	Area (Km2)	Area (%)	Area (Km2)	Area (%)	LU/LC Change (%)	LULC Growth rate (%)	Area (Km2)	Area (%)	LU/LC Change (%)	LULC Growth rate (%)
1	Vegetation	234.27	27.92	90.49	10.78	98.32	11.72	8.65	8.02	129.39	15.42	-44.77	-81.06
2	Water Bodies	15.87	1.89	10.68	1.27	15	1.79	40.45	29.05	25.11	2.99	58.22	36.79
3	Built-up Land	55.35	6.6	67.93	8.09	153.28	18.27	125.64	55.72	139.48	16.62	152.00	60.29
4	Crop Land	343.2	40.9	307.49	36.65	310.81	37.04	1.08	1.05	416.47	49.58	21.35	17.51
5	Fallow Land	190.47	22.69	362.57	43.21	256.59	30.51	-29.23	-41.63	123.92	14.77	-34.94	-53.62
6	Coal Dumping Site	NA	NA	NA	NA	5.16	0.67	100	100	4.79	0.62	100	100
Total Area		839.16	100	839.16	100	839.16	100			839.16	100		

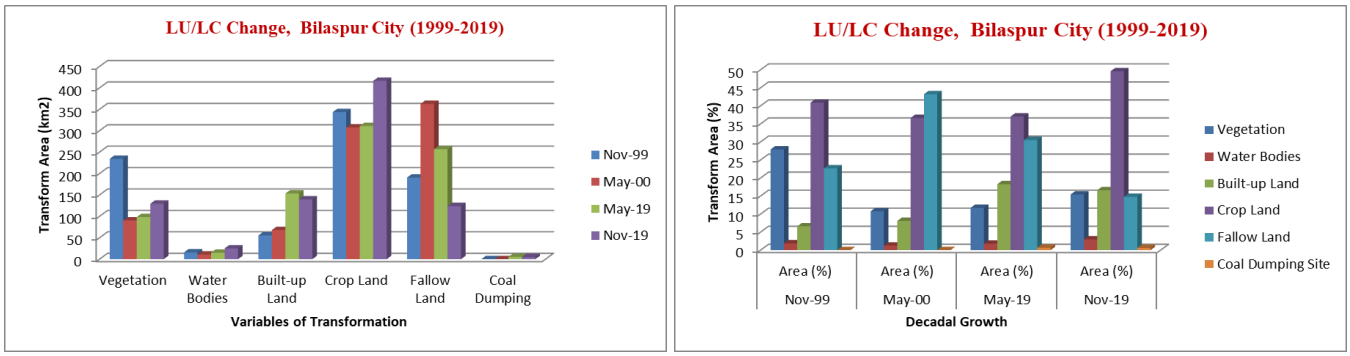
Source: USGS, LANDSAT-7 and I LANDSAT-8 imagery data analyzed by MS Excel.

NA: This data did not exist till 2005 because it is a new thing in the study area that emerged after the establishment of NTPC, Sipat, Bilaspur.

In November 1999, LU/LC was covered by continuous vegetation changes from 27%.92 to 10.78 % in two different months of the year. After 20 years, vegetation drastically decreases with time change and its uses by human nature. the Vegetation cover was 11.72% in May to 15.16% (234.27km2 to 129 km2 in November and 98.32km2 to 90.49 km2 in May 19999-2000) due to the rainfall during the monsoon season. There are four significant calculations in the table of LU/LC change in the percentage and LU/LC Growth rate in the percentage both are showing transform land cover data of study area. Whereas after 20 years actual vegetation changes 8.65% and its growth rate is 8.02% in May-2019 but both data has been -44.77 and growth rate is -88.06% changed in same year No-2019 from previous year data.

Water bodies in the study area are 15.87 km2 and 1.89% in November, and 10.68 km2 and 1.27% in May, 19999, but after the encroaching water bodies less than 15 km2 and 1.79%, Lu/Lc change 40.45%. The growth rate was 29.05% in May 2019, whereas Lu/Lc area is 25.11km2, 2.99%, and positive change of 58.22%, and the growth rate was 36.79% after the foundation of the new check dams and reservoirs due to management policy and planning of Developmental city board.

Diagram: 4.1 and 4.2 Column showing the existing LU/LC area and percentage of study area, (1999-2019)



Source: USGS, LANDSAT-7 and I LANDSAT-8 imagery data analyzed by MS Excel.

In the first phase of the Maratha period, the Bilasa village was minimal. Still, later on, it gradually expanded the elongated area of The Arpa River and, In the British (period 1862) and established a new township near the governing body. After the setup of the rail line, the white colony, and the main cantonment junction of Chhattisgarh, offices and small-scale trade and commerce were established, welcoming a large population for setting up.

In India, the post-independent industrial town was set up, which escalated the population explosion as the blast level population grew. the Built-up land cover is a very dynamic character and is used as a most important variable for this study; it is continually changing the face of the Peri-urban land use after the Post impedance the new mining site and industries surrounding the Bilaspur running and need more land for settlement but without any proper policy and planning. Further, this town's growth rate was slow, but after the second and third phases of the industrial revolution, land demand was very high, so from 1990 to 2021, new and high-rise buildings were settled. Table: 3.1 and all the maps and diagrams show significant change from vegetation, agricultural land, water bodies, and fallow land cover into built-up land. Built-up land was 55.35 km2 and 6.6% of the total area in November 1999 and but 67.93 km2 and 8.09 % in May 2000, in fast rate after the 20 years 153.28 km2 and 18.27%, and change of area 125.64% and growth rate of 55.72% in May and 139.48km and 16.62% but the change in area 152.00% and growth rate 60.29% noted.

These three LU/LC fast rate of growth rates and transform land cover into each other categories. The fourth type of land cover is a very dynamic land cover for specific changes in uses. Its changes with the population with time but after the reached pick level and fast rate of built-up growth in the agricultural area and land price is very high to sold builders for new landscape so crop cover land decreases with the change of use nature.

Diagram: 6. Column showing the LU/LC area and percentage of transformation of study area within 20 years (1999-2019).

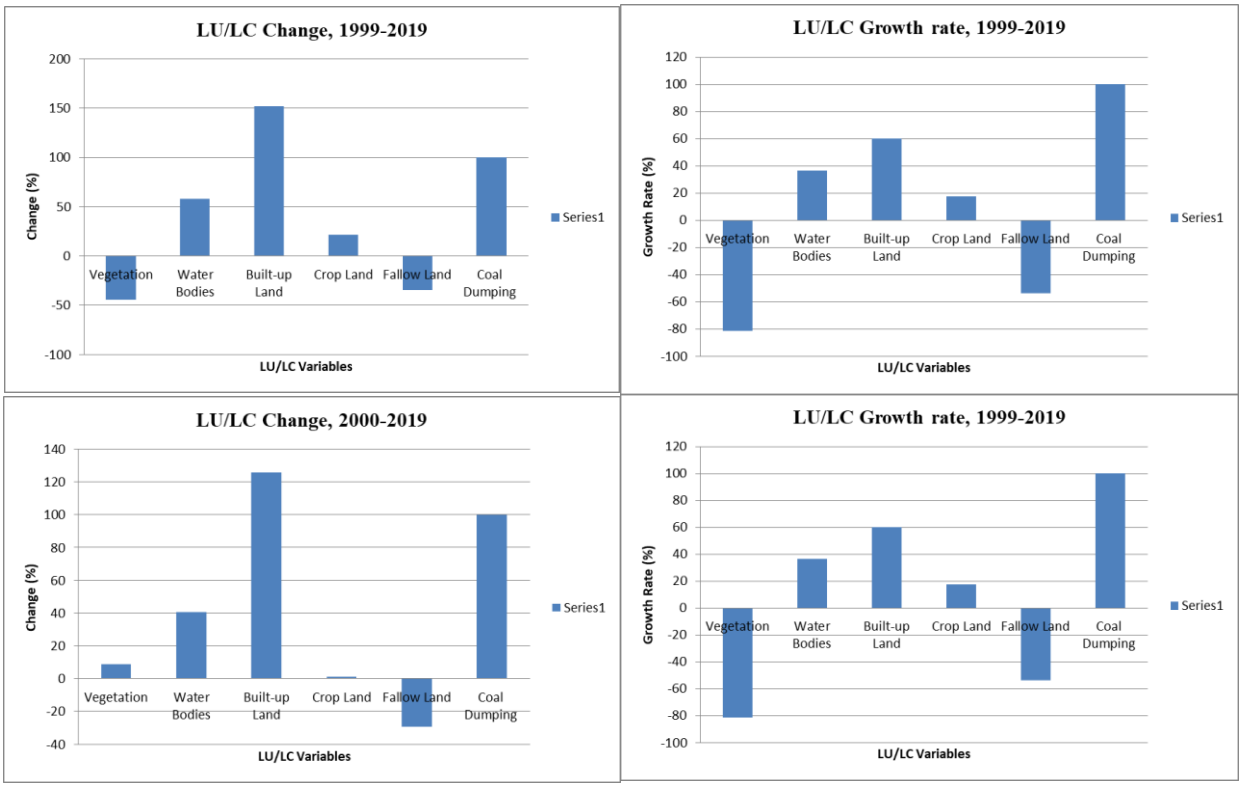


***Diagram**:-. 6.1,6.2,6.3,and 6.4: All columns* are *showing the LU/LC area and percentage of Transformation land of Study area within 20 years.(1999-2019)*

***Source:** USGS, LANDSAT-7 and I LANDSAT-8 imagery data analyzed by MS Excel.*

The Cropland cover was 343.2km^2 and 40.9% of the total area in November 1999. And post-Kharif and Rabi cropland were without crop cover so after the depletion 307.49km^2 and 36.65% exist in the month of May 2000. After two decades shown a minor change with 310.81km^2 and 37.04% of total area with the change of cover is 1.08km and growth rate was 1.05 in May 2019 and in Kharif season noted the crop area is 416.47km^2 and 49.58% in total area with change 21.35 and growth rate is 17.51% in November 2019.

Fallow Land is a type of land that is not used at present time, and a large area with rills and gullies un-fertile rugged, and barren ravines land due to rainfall and its upper top most layer depleted with runoff water land cover area without any vegetation and water. In November of 1999 there was 190.47km^2 and 22.69% due to Kharif cover and in May 2000 without any cropland its increases 362.57km2 and 43.21% of total area. Two decades later, fallow land cover is decreases from 362.57 to 256.59km^2 and 43.21% to 30.51% of the total area covered and the change of land is 29.23km2 and the growth rate was -41.63% in May 2019. In the month of November 2019, there is 123.92km^2 and 14.77% of land area covered with fallow but the change of area is -34.94%, and the change of growth rate is -53.62 % it's all data showing the change of nature and use of nature according to human uses for the agriculture after the irrigation facility, forestation, new water bodies-check dam and fulfills the low coast land for built-up land.

Another and last Lu/Lc classification category is the Coal Dumping site this is the newest thing in this area developed after the electricity demand and availability of row resources near to city for the fulfillment of Bilaspur as well as in-state. Coal dumping sites, it is used for dumping coal for the thermal power-based NTPC plant for electricity production. NTPC-Sipat is one of the biggest power plants in Chhattisgarh and central India with 2980

MW. Site there was no available in 1999-2000 but after the foundation in 2001-05 satellite imagery recorded this feature and in 2019 is with 5.16km2 and 0.67% of total area and change is 100% and growth rate is 100 in May 2019 and 4.79km^2 and 0.62% and change area is 100% and growth rate is 100 %. Overall data about the geospatial change pattern of Lu/Lc in the Peri-urban area is alarming for re-think about regulation & proper management and applying environmentally friendly policy and planning in Bilaspur city.

Diagram: 5. Pie-diagram showing the LU/LC in area and percentage of transformation of study area within 20 years (1999-2019).

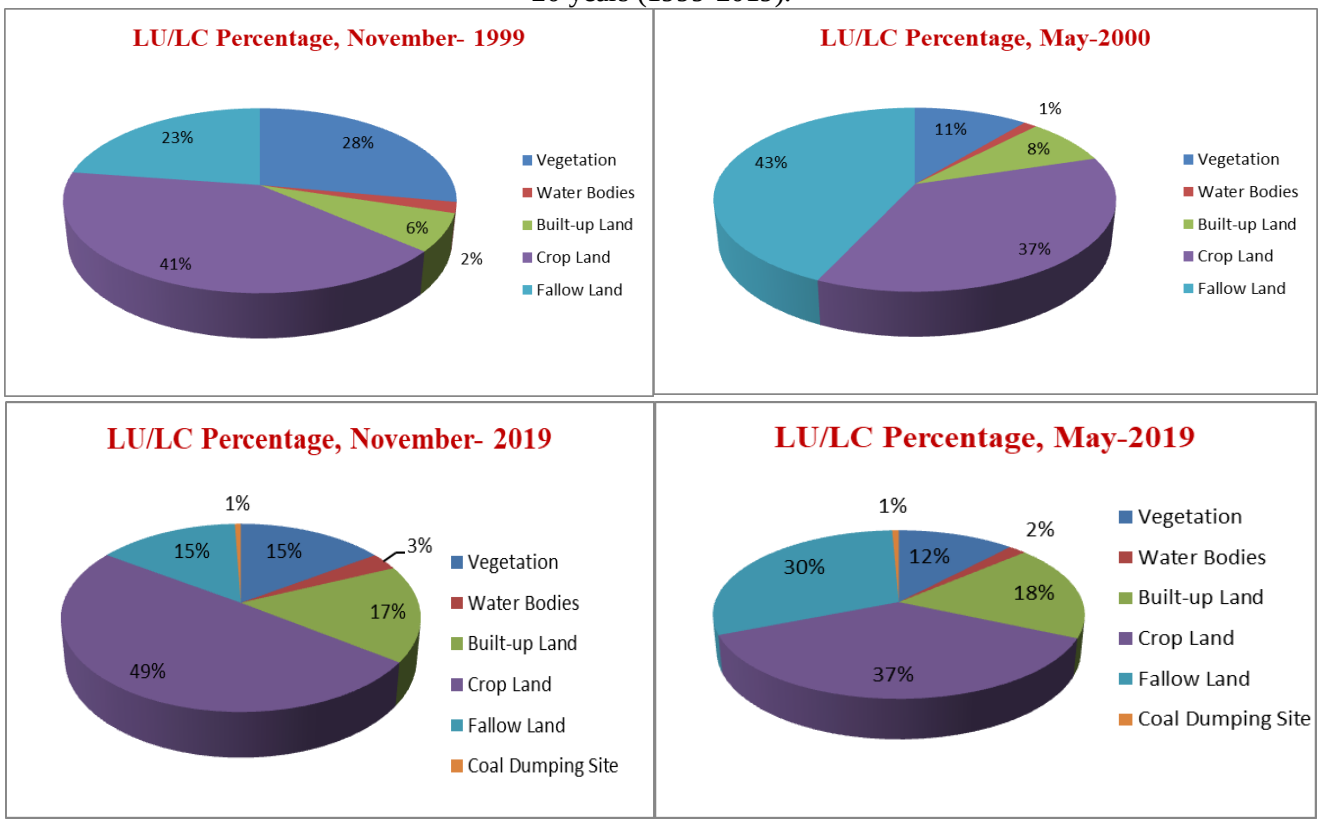


Diagram. 5.1,5.2,5.3,and 5.4: All Pie-diagrams are *showing the LU/LC area and percentage of Transformation land of Study area within 20 years.(1999-2019)*

Source: USGS, LANDSAT-7 and I LANDSAT-8 imagery data analyzed by MS Excel.

The nature of LU/LC change of cultivated land without crops from 36.65% to 37.04 % in the month May, 1999 to 2019, and fallow lands were 22.69% to 43.21% in May 2000 to May 2019 in the same year bur deferent months. Built-Up land area 16.5% to 18.5% continuously developing in the outskirt of the city, in the positive manner water bodies are increasing after city become 3 lac populous. Here, one thing is very interesting about the new landscape emerging due to the Coal Dumping sites that are expanding in the periphery of the city. The city put to non-agricultural use, cultivable wasteland, permanent pasture, grazing land, miscellaneous two crops, and grooves. All the figures 5.1 to 5.4 exhibit the percentage of Land use pattern in Peri-Urban for the year 1999-2019. It is very clear that the cultivable area has been occupied as the average percentage i.e. 41 to 49% percent. The land put to non-agricultural uses such as building, roads, railway lines, rivers, canals and check dams, social forestry, and other activities constituted a good percentage. There is a very low percentage for permanent pasture and grazing land and current fallow constitute about 1% percent and 1.5% respectively. The miscellaneous trees, crops, and grooves

overall constitute about 60% percent. Most of the industrial and commercial activities of the region revolve in the Periphery.

Major Findings

This study shows the rapid urban expansion in the Peri-urban zone between the selected time periods of two decades. The institutions and infrastructural development had played a vital role in Peri-urban expansion due to the process of transformation in Bilaspur City. All these tables and diagrams clearly state the increase in the built-up land and coal dumping sites land cover is one site that provides many opportunities and another side leads to many problematics that is increase in surface runoff and decrease in the natural ground water recharge.

The Coal Dumping Sites have emerged as a new feature in the Peri-urban area of the city. Built-Up land has grown 18% while other uses of land have decreased; built-up land area growth shows that the expansion is mainly occurring on fallow and crop land as they have experienced a loss of area in the study time period. The LU/LC map is clearly depicted that the Peri-urban area of Bilaspur city has lost a considerable amount of vegetation cover especially in the eastern side of the city. The area under the water body has grown 3% with the development of tanks and reservoirs in the Peri-urban area. The crop land area has also minor decreased due to the expansion of built-up land and Coal dumping sites but crop land has increased by 4% with population growth and the demand of locals.

Conclusion

This research paper deals with the Geospatial change in the Peri-Urban area of Bilaspur city, Chhattisgarh, Central India using RS & GIS techniques. The study indicates unregulated expansion in the Peri-urban area between the selected periods of two decades, 1999-2019, which seriously affects the pattern of land uses in the city and its surrounding settlements. The unregulated expansion in the Peri-urban is a common occurrence that is taking place in all Indian cities and the world, and this leads to Peri-urban land use land cover change. The Land use land cover changes in Indian cities are unplanned manner so managing and checking the core issues of Peri-urban is a very big task for urban planners. Incompatible transformation of Land uses cover and undue intrusion into green spaces in the contiguous settlements due to good livelihood. The results depict the significant transformational changes in LU/LC from 1999 to 2019. There is an essential expansion of Built-up land area detected. On the other hand, there is an increase in cropland, water bodies, and vegetation cover. This study indicates the significant impact of population and its development activities on land use land cover change. This research provides that assimilation of RS and GIS technologies is a simple tool for Bilaspur urban planning and management. The quantification of Peri-urban Lu/Lc changes of Bilaspur city region is very useful for understanding the local environs, planners and policymakers, master plan, land acquisition, development of zones, and further solid based environmental management. The board is to be made responsible for preparing and implementing planning schemes and local. The municipal corporation is to be made responsible for the policy and implementation of planning schemes and local. Therefore, the urban governing and management body should control measures over private and public Land uses through proper approaches. This will drive a long way to assist in regulating Land uses for sustainable development in the Peri-

urban region of this city. The infrastructural development has played a vital role in Peri-urban expansion due to the transformation process in the Peri-urban area of Bilaspur City.

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