LAND USE CLASSIFICATION OF JASHPUR DISTRICT (C.G.): A GEOGRAPHICAL STUDY

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Abstract:

The present research study undertakes a detailed geographical analysis of the land use classification of Jashpur district, situated on the north-eastern corner of Chhattisgarh state. Due to its distinct geomorphological structure, Jashpur district is divided into two distinct geographical regions known as 'Upper Ghat' and 'Nichghat' which directly influence the land use classification. The primary objective of this research is to classify the current utilization of available land resources in Jashpur district, to assess the area falling under various categories and to conduct a geographical analysis of the changes observed in these categories over time. Both primary and secondary data have been used in this study. Government statistical reports (such as the District Statistical Handbook and the District Census Handbook-2011), along with LISS III satellite data, 2022 and Arc-GIS techniques, were applied to generate land use classification maps. Paddy is the principal crop of the region, cultivated across approximately 75-82% of the total arable land. In recent years, Jashpur has witnessed an expansion of tea and coffee plantations alongside traditional crops. The study reveals that, owing to Jashpur's rugged topography and limited irrigation facilities, the land resources are not being utilized to their full potential. Consequently, for the sake of sustainable development, there is a pressing need for scientific land use planning and the promotion of horticultural crops.

Key Words: Land Use Classification, Jashpur District, Current Utilization, Sustainable Development.

INTRODUCTION:

Land is a vital and finite resource bestowed by nature, serving as the fundamental basis for the economic, social, and ecological development of any region (**Singh & Singh, 2011**). Land use patterns within a specific area are determined by local geographical conditions such as topography, climate, and soil as well as by human activities (**Khan & Das, 2021**). In the contemporary era, driven by a growing population and unregulated development, rapid shifts are being observed in land use patterns; consequently, a scientific study of these changes is imperative for effective planning and sustainable development (**Sharma et al., 2023**). Situated in the northeastern corner of Chhattisgarh state, Jashpur district holds immense significance from the perspective of geographical study, owing to its distinctive topography and rich biodiversity (**Yadav & Tripathi, 2023**). Currently, driven by population growth and developmental aspirations, Jashpur's traditional land use systems are undergoing rapid transformation. Agriculture, which constitutes the backbone of the local economy, is primarily centered on paddy cultivation (accounting for 72.28%). However, in recent years, innovative agricultural experiments such as the establishment of tea and coffee plantations along with the expansion of horticultural crops, have steered the local landscape in a new direction. Land use in

Jashpur district is predominantly characterized by agriculture and forest cover. Approximately 42.6% of the total land area is covered by forests, which serve as a primary source of livelihood for the local tribal population. Within the agricultural sector, paddy cultivation predominates, accounting for approximately 72% of the total sown area. Nevertheless, in recent years, factors such as urbanization, infrastructure development, and evolving agricultural practices have brought about changes in the extent of forest cover and barren lands.

STUDY AREA:

The present study area is mainly tribal areas and economic structure of the study area is based on agricultural activities and predominantly agro-based industry. It is situated in north-eastern corner of Chhattisgarh state in India and the three district of state (Balrampur - Ramanujganj, Sarguja and Raigarh) are adjoining with Jashpur district. Jashpur district is Geographically located in between $22^0$17' North to $23^0$15' North latitudes and $83^0$30' East to $84^0$24' East longitudes. The total Geographical area of Jashpur district is 6,205 sq. km. The district having eight Tahsils which are namely - tahsil Bagicha, tahsil Duldula, tahsil Jashpur, tahsil Kansabel, tahsil Kunkuri, tahsil Manora, tahsil Pathalgaon and tahsil Farsabahar. Matasi, Dorsa, Kanhar, Bhata, Tikra and Kachar are the major principle soil and the Matasi (Red yellow soil) soil has considered as the best soil for rice cultivation in the study area. According to district census handbook of Jashpur, 2011 the 'total cultivated area' is 326700 hectares whereas 'net sown area' is 267200 hectares and the 'area sown more than once' are 59500 hectares.

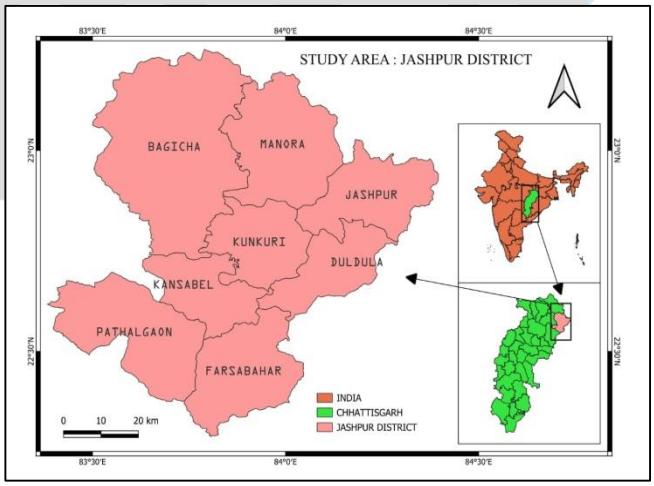


Fig. no. 01: Location map of the study area.

OBJECTIVES OF THE STUDY: The primary objectives of this research are:

1. To classify the current utilization of available land resources in the Jashpur district.
2. To assess the area covered by various categories of land use.
3. To conduct a geographical analysis of the changes in land use that has occurred over time within the study area.

DATABASE & RESEARCH METHODOLOGY:

The present study is based on primary and secondary data. Data has been collected from the Government Statistical Reports, such as the District Statistical Handbook (Reference year: 2015-16 & 2019-20) and the District Census Handbook - 2011. LISS III satellite data, 2022 and Arc-GIS

technique has been used to prepare the land-use classification maps. Bar diagrams are also used for visual look of the land use classification of the study area.

RESULTS & DISCUSSION:

LAND USE SURVEY:

Land use survey is a very significance aspect in agricultural geography. Mapping of land use survey are recognized as essential tools for the preparation of land use capability as well as land use classification which is provides the more guidelines for the overall development of agriculture, regional planning and orientation of agricultural activities in future (**Pandey & Verna, 2023**). Land use survey is very helpful for understanding the variations of land uses and land productivity through field observation. It is also provides the impact of human activities on land and known about the relationship between land utilization and physical environment (**Pawar, 2025**).

COMPONENTS OF LAND USE CLASSIFICATION:

As a natural resource land is very important for human being which embraces the different elements like the moisture, topography, overlying temperature, physical structure and soil matrix (**Shori et al., 2025**). The land use classification has been based on the following components such as -

(a) The assessment of physical characteristics of land and agricultural potential power of a land which is known as land capability. The physical qualities or properties of land are unchangeable during different periods of time.

(b) The monitoring or assessment of land quality under the prevailing set of socio-economic factors including agricultural farm structure, irrigational facility, cost of labours, inputs of capital, use of different technology , outputs of agricultural land and stability of prices which are more variable on land production.

LAND USE CLASSIFICATION OF THE STUDY AREA:

Land use Classification is a systematic arrangement of land on the basis of specific similar characteristics mainly for understand and identify the fundamental utilization of land effectively and intelligently. The land use pattern is generally dynamic and complex in nature (**De et al., 2014**). The classification of land on the basis of its quality for a specific purpose is known as ‘land use classification’. According to district statistical handbook, on the basis of reference year 2015-16, the land use of study area have been classified into following categorizes -

(I) FORESTS AREA (REVENUE + FOREST):

Forest is an important natural resource for human beings. In the study area, forest means rural forest which is mentioned by the Patwari of village in the land record sheet. The geographical distribution of rural forests is influenced by the nature of land, type of soil and population density. Forests are not only supply the fuel, woods etc. but they are also useful in soil conservation as well as maintaining the environmental balance. Reserved and protected forests are not included in this forest area. In reference year 2015-16, land utilization of Jashpur district is 227872 hectares under the forests

area and out of the total reporting area for land utilization statistics in Jashpur district, 35.28 % land utilization have been found under this category.

(II) AREA NOT AVAILABLE FOR CULTIVATION:

Under these category settlements, routes of transport, mines, industry, canals and reservoirs are included. The cultural and economic development of the area can be assessed by the expansion of this type of land while infertile , stony, rough, rocky and marshy land are included under the barren and unfit land for agriculture. Under this category which land area comes those land area are not use for cultivation. In reference year 2015-16, land utilization of Jashpur district is 78265 hectares under the category of area not available for cultivation. Out of the total reporting area for land utilization statistics in Jashpur district, 12.12 % land utilization has been found under this category. Area not available for cultivation is further divided into two sub categorized such as -

(a) Area under non-agricultural uses:

This area stands for all lands occupied by buildings, industrial undertakings, roads and railways or under water that is rivers and canals etc. This area is not available for cultivation and it is used for non-agricultural uses. Area under non-agricultural uses in the study area is 25178 hectares.

(b) Barren and Un-Cultivable Land:

This land area is not available for cultivation due to lack of nutrient elements in land as well as adverse environmental conditions which land is known as barren land and it is also called un-cultivable land. Under this category the hilly, mountains and deserts area etc. are included. The barren and un-cultivable land area of Jashpur district is 53087 hectares.

(III) OTHER UN-CULTIVATED LAND EXCLUDING FALLOW LAND:

Under this type of land the permanent pastures, other grazing land, mixed tree-crops, groves and agricultural waste land are included while the grass, bamboo-shrubs and other forest trees, which are used in fuel etc. are also included under this category. In reference year 2015-16, land utilization of Jashpur district is 51775 hectares under the category of other un-cultivated land excluding fallow land. Out of the total reporting area for land utilization statistics in Jashpur district, 8.02 % land utilization has been found under this category. The main reason for the excess of other un-cultivated land excluding fallow land is that animal husbandry work is more in the river basin and pat region as compared to other areas, while its expansion is relatively less due to the inclusion of agricultural waste land in rural forest and permanent pastures. Other un-cultivated land excluding fallow land is further divided into three sub-types which as follows -

(a) Permanent Pastures and other Grazing lands:

The permanent pastures and other grazing lands cover all grazing lands, whether they are permanent pastures and meadows or not. The common land in the village and grazing land are found within the forests areas are included under this category. In the study area 43060 hectares permanent pastures and other grazing lands are found.

(b) Land under Miscellaneous tree crops and Groves not included in net sown area:

The miscellaneous tree crops and groves are grown in such areas which are not included under the net sown area. All the cultivable land put to some agricultural uses but not included under the net sown area. The lands under thatching grasses, bamboo bushes and other groves trees for fuel etc. which are not included under orchards are placed under this category. Land under Miscellaneous tree crops and Groves not included in net sown area of Jashpur district is 00 hectares in the reference year 2015-16.

(c) Cultivable Waste land:

It includes those lands which are cultivable but due to various physical, social and economic constraints, the agricultural activities are not done in it. This land is covered with the small trees and plants which are situated in the middle plot of agricultural land. 8715 hectares cultivable waste land is found in the study area.

(IV) FALLOW LAND AREA:

Under this category that land is included in which agricultural work has been done at one time or the other but for the last 1-5 years agricultural work is not being done temporarily for improved the fertility of land. In reference year 2015-16, land utilization of Jashpur district is 44222 hectares under the category of fallow land area. Out of the total reporting area for land utilization statistics in Jashpur district, 6.85 % land utilization has been found under this category. The main reason for the excess of fallow land in the study area is the nature of slope more than 1-3 degree, uneven relief, low fertility in the soil and as a result of the decrease in the amount of rainfall. To maintain soil fertility the fallow land is also left, which is a normal process of crop rotation. This type of land is divided into two classes - old fallow land and current fallow land.

(a) Fallow Lands Other than Current fallow (Old Fallow land):

Under the category of fallow lands other than current fallows, that kinds of land is included in which land were taken up for cultivation but for a period of not less than one year and not more than five years cultivation work is not being done temporarily on this land for maintaining the soil fertility. Fallow lands other than current fallows (old fallow land) are originated due to the different factors such as inadequacy of water supply, lack of nutrient elements in land, land erosion, inability of cultivators to farming, water logging, adverse climatic conditions and silting by the canals or rivers etc. In the study area the total fallow lands other than current fallows (old fallow land) area is 17246 hectares.

(b) Current (Recent or New) Fallow land:

Current (recent or new) fallow land comprises cropped areas which are kept fallow during the current or recent year due to different causes such as low productivity of land, shortage of water supply, economic incomes from agriculture are unsatisfactory, inadequate supply of water and water logging and water pollution etc. A closely relationship are found in between the fallow lands and the net sown area. In the study area the current (recent or new) fallow land area is 26976 hectares.

(V) NET SOWN AREA:

Net sown area refers to the land on which crops were grown during the study year. In reference year 2015-16, land utilization of Jashpur district is 243607 hectares under the category of net sown area. Out of the total reporting area for land utilization statistics in Jashpur district, 37.73 % land utilization has been found under this category. Under the study area the area of forest land is less, in those areas the area of net sown area is more and in the areas where the area of forest land is more, the area of net sown area is less. The extension of net sown area is more in flat plains, while the area of net sown area is less in plateau and high slope regions.

Reporting area for land utilization Statistics:

Under this category the total reporting area for land utilization is represented, which is also provides the detailed statistics about land utilization of the study area. The reporting area of the study area stands for the area in which data on land use classification are available. Land utilization is based on the land revenue records and reporting area is one of them according to village land use map which is prepared by the village Patwari. The total reporting area of land utilization in Jashpur district is 645741 hectares.

Area Sown More than Once:

Area sown more than once are defined that which kind of land areas where crops are cultivated more than once during the given agricultural year. Area sown more than once is calculated by deducting the net sown area from the gross cropped area. 13256 hectares land areas is found in the study area under the category of Area sown more than once.

Total Cropped Area:

Total cropped area is also known as the gross cropped area and it is represents the cumulative or total area under all crops which is sown once and /or more than once in a specific year that the area is counted as many times in a given study year. The total cropped area is 256863 hectares in the study area, which are shown in the table no. 01 & cartographically represented in the fig. no. 02 & 03.

Table no. 01

Land use classification & Land utilization in Jashpur district (Reference year: 2015-16)

Sl. No.	Land Use Classification		Land Utilization (Hectares)
(I)	Forests Area (Revenue + Forest)		227872
(II)	Area not Available for Cultivation	(a) Area under non-agricultural uses.	25178
		(b) Barren and Un-Cultivable Land.	53087
		Total	78265
(III)	Other Un-cultivated land Excluding Fallow land	(a) Permanent Pastures and other Grazing lands.	43060
		(b) Land under Miscellaneous tree crops and Groves not included in net sown area.	00
		(c) Cultivable Waste land.	8715
		Total	51775
	Fallow Land Area	(a) Fallow Lands Other than Current	17246

(IV)		Fallows (Old Fallow land).	
		(b) Current (recent or new) Fallow land.	26976
		Total	44222
(V)	Net Sown Area		243607
Reporting area for land utilization statistics			**645741**
Area Sown More than Once			**13256**
Total Cropped Area			**256863**

Source: District Statistical Handbook (Reference year: 2015-16), Land records branch of Jashpur district (C.G.).

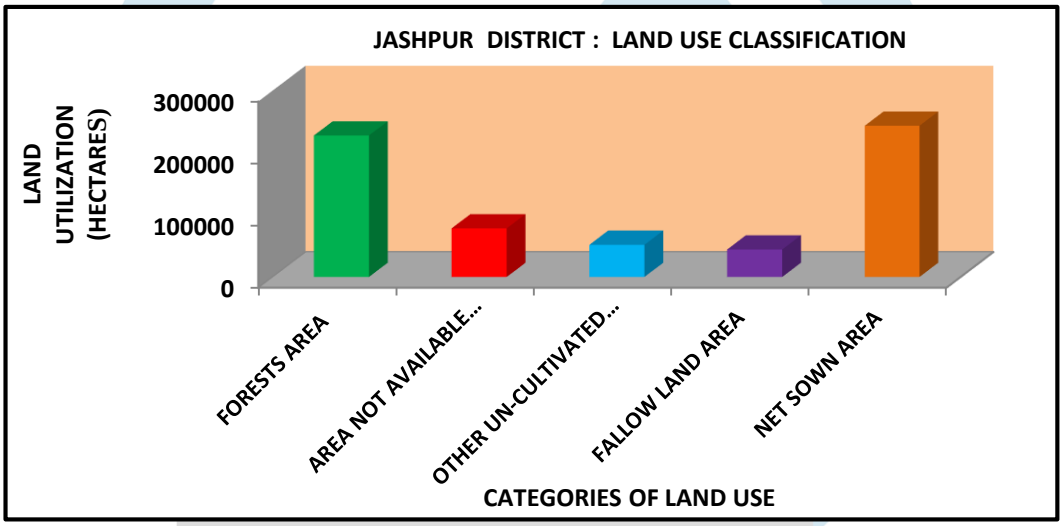


Fig. no. 02: Land utilization in category wise of Jashpur district.

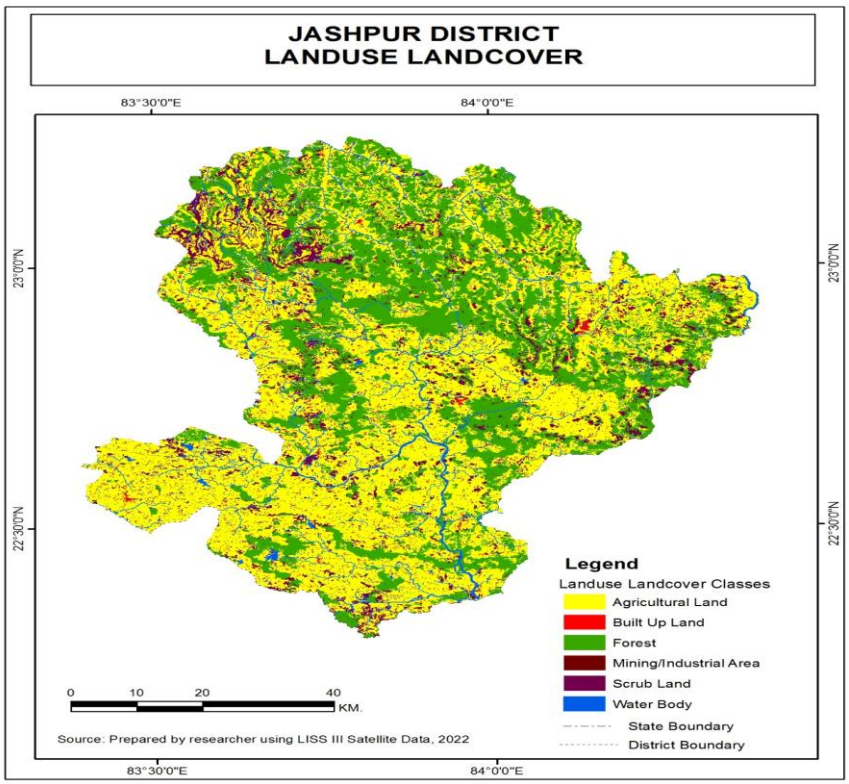


Fig. no. 03: Land use - Land cover classification of Jashpur district using satellite data.

TAHSIL WISE LAND USE CLASSIFICATION IN JASHPUR DISTRICT:

According to district statistical handbook of Jashpur district (Reference year: 2019 - 20) in Chhattisgarh state, the following table no. 02 is shows the tahsil wise land use classification. In tahsil Bagicha the forest area (revenue + forest) is 28.23 %, area not available for cultivation is 21.20 %, other un-cultivated land excluding fallow land is 42.07 %, Fallow land is 29.03 %, the net sown area is 20.07 %, area sown more than once is 31.88 % and total cropped area is 20.67. In tahsil Kansabel the forest area (revenue + forest) is 8.38 %, area not available for cultivation is 7.71 %, other un-cultivated land excluding fallow land is 7.64 %, Fallow land is 8.33 %, the net sown area is 9.98 %, area sown more than once is 6.70 % and total cropped area is 9.82 %. In tahsil Jashpur the forest area (revenue + forest) is 5.22 %, area not available for cultivation is 12.70 %, other un-cultivated land excluding fallow land is 6.30 %, Fallow land is 14.16 %, the net sown area is 9.84 %, area sown more than once is 2.37 % and total cropped area is 9.46 %. In tahsil Manora the forest area (revenue + forest) is 9.52 %, area not available for cultivation is 22.52 %, other un-cultivated land excluding fallow land is 6.79 %, Fallow land is 13.45 %, the net sown area is 10.16 %, area sown more than once is 6.83 % and total cropped area is 9.99 %.

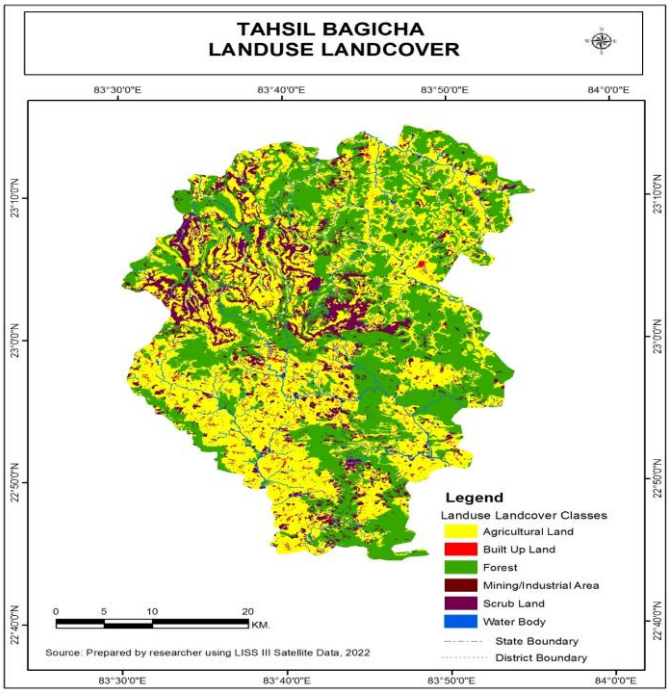
In tahsil Kunkuri the forest area (revenue + forest) is 5.62 %, area not available for cultivation is 6.23 %, other un-cultivated land excluding fallow land is 7.99 %, Fallow land is 5.91 %, the net sown area is 11.30 %, area sown more than once is 5.63 % and total cropped area is 11.01 %. In tahsil Duldula the forest area (revenue + forest) is 10.49 %, area not available for cultivation is 9.89 %, other un-cultivated land excluding fallow land is 6.02 %, Fallow land is 4.51 %, the net sown area is 7.43 %, area sown more than once is 2.48 % and total cropped area is 7.18 %. In tahsil Farsabahar the forest area (revenue + forest) is 20.66 %, area not available for cultivation is 11.63 %, other un-cultivated land excluding fallow land is 11.00 %, Fallow land is 10.95 %, the net sown area is 11.85 %, area sown more than once is 6.66 % and total cropped area is 11.58 %. In tahsil Pathalgaon the forest area (revenue + forest) is 11.88 %, area not available for cultivation is 8.12 %, other un-cultivated land excluding fallow land is 12.19 %, Fallow land is 13.66 %, the net sown area is 19.37 %, area sown more than once is 37.45 % and total cropped area is 20.29 %, which are shown in the table no. 02 & cartographically represented in the fig. no. 04.

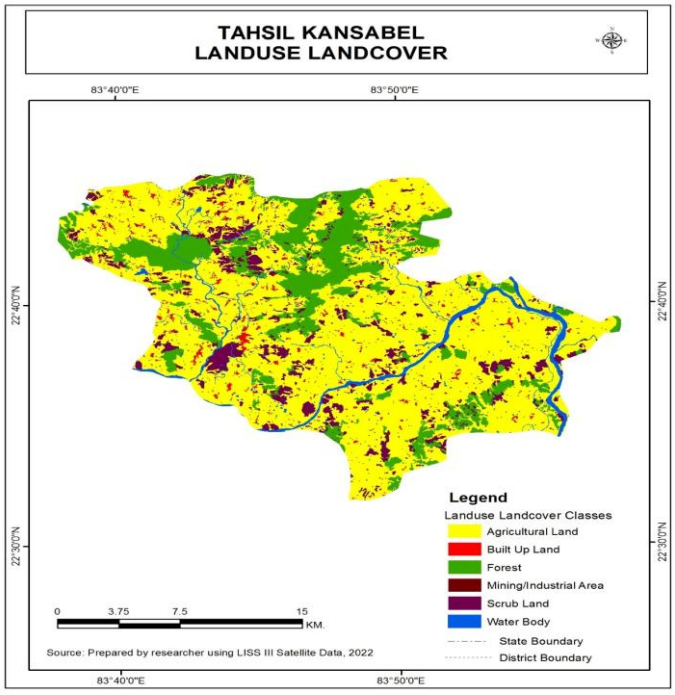
Table no. 02

Tahsil wise land use Classification in Jashpur District (Reference year: 2019-20)

Land Use Classification	Land Utilization in Percentage							
	BAGICHA	KANSABEL	JASHPUR	MANORA	KUNKURI	DULDULA	FARSABAHAR	PATHALGAON
Forest Area (Revenue + Forest)	28.23	8.38	5.22	9.52	5.62	10.49	20.66	11.88
Area not Available for Cultivation	21.20	7.71	12.70	22.52	6.23	9.89	11.63	8.12
Other Un-cultivated land Excluding Fallow land	42.07	7.64	6.30	6.79	7.99	6.02	11.00	12.19
Fallow land	29.03	8.33	14.16	13.45	5.91	4.51	10.95	13.66
Net sown area	20.07	9.98	9.84	10.16	11.30	7.43	11.85	19.37
Area Sown More than Once	31.88	6.70	2.37	6.83	5.63	2.48	6.66	37.45
Total Cropped Area	20.67	9.82	9.46	9.99	11.01	7.18	11.58	20.29

Source: District Statistical Handbook (Reference Year: 2019 - 20), Land records branch of Jashpur district (C.G.).





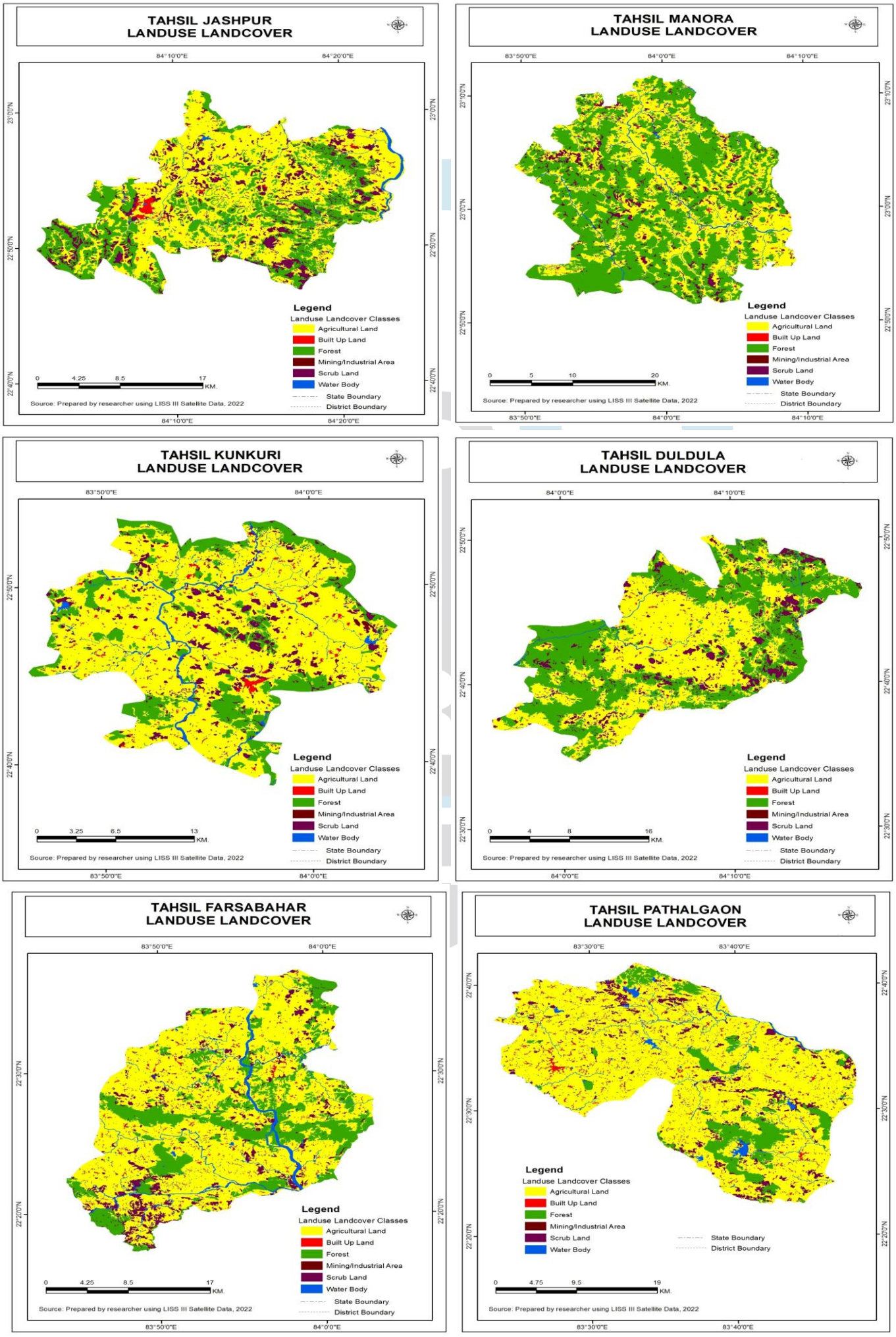


Fig. no. 04: Tahsil wise land use Classification in Jashpur District.

CONCLUSION:

In conclusion, the rugged topography of the study area particularly the division between the Upper Ghats and the Lower Ghats profoundly influences land management practices in the region. According to the study, a vast portion of the district is under forest cover, which not only safeguards biodiversity but also serves as a primary source of livelihood for local tribal communities. The district's economy is predominantly agrarian, with paddy being the staple crop. However, recent years have witnessed a diversification in land use patterns. Jashpur is now emerging as a tea-producing district within Chhattisgarh. The study reveals that, alongside the expansion of irrigation facilities, there has been an increase in the double-cropped area, resulting in a corresponding reduction in the extent of fallow land. Driven by population growth, forestlands and agricultural lands are increasingly being converted into built-up areas for residential and infrastructural development. The study area mainly dedicated to Rabi crops remains smaller than that of Kharif crops. Scientific land-use planning is imperative for ensuring sustainable development in the Jashpur district.

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