

A Study of Forest Cover in Giridih District of Jharkhand

Bhavna Kumari

Research Scholar
Department of Botany
Binod Bihari Mahto Koyalanchal University, Dhanbad
(Jharkhand)

Dr. Pallavi Praveen

Assistant Professor & HOD, Department of Botany
B. S. City College, Boakro (A Constituent Unit of Binod Bihari
Mahto Koyalanchal University, Dhanbad, Jharkhand)

Abstract

The analysis of forest cover is of high importance for botanical and ecological research as it yields vital information about composition, distribution, diversity, and spatial characteristics of vegetations in certain geographical region. Moreover, it allows researchers to investigate environmental and geographical factors that contribute to the growth and distribution of different plant species. This study focuses on the study of the nature, distribution, and extent of forest cover in Giridih district in the state of Jharkhand in India. This district has rich forest resources featuring vegetation of various categories that include relatively dense forests, open and degraded forest cover. These forests create favorable conditions for growth of different kinds of plants, including some plants that serve as natural sources of food and other useful products among local population. This paper will attempt to provide an understanding of the forest cover and its spatial distribution as the basis for identification of the sources of edible plants in the district in question, taking into account geographical and environmental features connected with different forest covers and vegetation in the district. The study is descriptive and analytical in its nature and uses mainly secondary sources such as government reports and research papers dealing with the issues related to the forest cover and its distribution in the area under consideration. The scope of this paper is limited to the analysis of the nature and distribution of forest cover and not to the detailed botanical investigation of individual edible plants.

Keywords: Forest Cover, Giridih District, Edible Plants, Vegetation Distribution, Jharkhand

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Introduction

Forests can be termed as one of the most vital components of nature performing ecological, economic and socio-cultural roles necessary for sustainable development (Forkuo & Frimpong, 2012). Forests are especially significant in eastern states like Jharkhand as they are intimately linked with the sustenance, culture, food habitations and indigenous knowledge systems of the people in this region (Kumar & Saikia, 2020). Forest ecosystems offer timber, fuel wood, fodder, medicinal herbs, fruits, flowers, leaves, seeds, roots, tubers, mushrooms and many more such products that help in the subsistence of households directly or indirectly (Ajaz-ul-Islam et. al., 2013). Hence, forests should not be understood in terms of only tree growth but also as dynamic ecosystems producing bio-diversity and sustaining human well-being (Brockerhoff et. al., 2017).

Physiographic condition of Jharkhand comprises various physiographic features such as plateaus, hills, valleys, rocky uplands and river basins. The combination of these physiographic conditions along with differences in soils, rainfall, temperature, altitude and anthropogenic activities affect the nature of vegetation in different regions of Jharkhand (Turkey, et. al., 2018). The district of Giridih is one of the significant geographical units in this regard as its natural landscape includes upland area, hills, forests, agricultural lands, settlements, and anthropogenic activities such as agriculture and deforestation in the area leading to significant difference in vegetation and forest resources of the area (Thakur & Sahu, 2025).

Forest resources of Giridih possess much more significance than ecological role. Rural communities in the region depend on forests for complementing agriculture, consumption and livelihood requirements. Many naturally occurring plants and forest products are parts of food habits and indigenous knowledge systems of the region (Gupta, 2020). However, growing population, settlements, anthropogenic activities and many other factors affecting forests might have effects on their state and continuation. Hence, geographical characteristics of forests in Giridih are very important for studying their relation with locally available plant resources and to find out appropriate ways of conservation, sustainable utilization and preservation of indigenous knowledge related to forest based food resources.

Objectives and Approach of the Study

The current study has tried to meet the following objectives:

1. To analyze the characteristics, magnitude, and spatial pattern of forest cover in Giridih district of Jharkhand.
2. To determine the important forest regions where natural conditions are favorable for the presence of edible plants.

The approach followed by the study is descriptive and analytical and uses only secondary sources of information. Data has been collected from the reports of Forest Survey of India, government publications, district records, research papers, books,

and other relevant literature. Available information on forest cover and geography has been analyzed to get the existing pattern of forest resources in Giridih district.

Forest Cover in Giridih District

Based on the 2023 assessment of Department of Forest, Environment & Climate Change Government of Jharkhand,, Giridih district has a calculated geographical area of 4,962 km², of which 900.20 km² is under forest cover. Thus, forests constitute 18.14 percent of the district's calculated area. In comparison with Jharkhand as a whole, where 29.81 percent of the geographical area is under forest cover, Giridih has a considerably lower proportion. Nevertheless, its total forest area is substantial and represents an important component of the district's natural resource base.

The forest cover of Giridih is distributed across three density categories. Very Dense Forest (VDF) accounts for 77.20 km², representing only a small proportion of the total forest cover. Moderately Dense Forest (MDF) extends over 333.39 km², while Open Forest (OF) constitutes the largest category, covering 489.61 km². This indicates that more than half of Giridih's forest cover occurs in the open-forest category. Such a pattern reflects relatively fragmented and less densely wooded vegetation across considerable parts of the district. Another important feature is the change in forest cover compared with the 2021 raster-based assessment. Giridih recorded a positive change of 0.77 km², suggesting that the overall forest area remained broadly stable with a marginal increase. The district also contains 31.07 km² of scrub, indicating the presence of areas with sparse or degraded vegetation that may have potential for ecological restoration.

From the perspective of the present study, the combination of very dense, moderately dense, open forest, and scrub areas creates varied ecological conditions for different plant communities. Moderately dense and open forests are particularly relevant because greater light penetration and heterogeneous vegetation may support diverse shrubs, herbs, climbers, fruit-bearing species, tubers, and other useful plants. Therefore, the forest-cover structure of Giridih provides an important geographical basis for further investigation of naturally occurring edible plant resources.

Table 1: Forest Cover Status of Giridih District, 2023

Particulars	Area/Value
Calculated Geographical Area	4,962 km ²
Very Dense Forest	77.20 km ²
Moderately Dense Forest	333.39 km ²
Open Forest	489.61 km ²
Total Forest Cover	900.20 km ²
Forest Cover as % of Geographical Area	18.14%
Change with respect to 2021	+0.77 km ²
Scrub	31.07 km ²

Source: Official Webiste of Department of Forest, Environment & Climate Change Government of Jharkhand, <https://forest.jharkhand.gov.in>

Comparative Position of Giridih in Jharkhand

The district-wise data show considerable spatial variation in forest cover across Jharkhand. The state has a calculated geographical area of 79,716 km², with 23,765.78 km², or 29.81 percent, under forest cover. Against this state average, Giridih's forest-cover proportion of 18.14 percent is relatively low. However, in absolute terms, its 900.20 km² of forest cover makes it an important forest-bearing district.

The contrast becomes clearer when Giridih is compared with selected districts. Latehar has the highest percentage among the districts shown, with 55.54 percent forest cover, followed by Chatra at 48.40 percent, West Singhbhum at 46.76 percent, and Hazaribagh at 46.18 percent. Giridih's proportion is also below neighbouring or regionally comparable districts such as Kodarma (27.39 percent) and Hazaribagh. However, it is higher than Deoghar (8.30 percent), Dhanbad (10.84 percent), Dumka (15.66 percent), Pakur (15.80 percent), and Jamtara (5.94 percent).

A notable characteristic of Giridih is the dominance of open forest. Of its 900.20 km² total forest cover, approximately 54.39 percent is open forest, 37.03 percent is moderately dense forest, and only about 8.58 percent is very dense forest. This composition suggests that forest resources are present over a sizeable area but are predominantly represented by relatively lower-density vegetation.

For the study of edible plant resources, forest density is particularly relevant because different vegetation conditions may support different groups of plants. The substantial extent of moderately dense and open forests in Giridih therefore deserves detailed botanical investigation. The positive change of 0.77 km² between the 2021 and 2023 assessments is small but also indicates that the district did not experience an overall decline during the assessment period.

Table 2: Giridih Forest Cover in Comparison with Jharkhand, 2023

Indicator	Giridih	Jharkhand	Giridih's Position
Calculated Area	4,962 km ²	79,716 km ²	6.22% of state area
Very Dense Forest	77.20 km ²	2,635.35 km ²	2.93% of state VDF
Moderately Dense Forest	333.39 km ²	9,640.99 km ²	3.46% of state MDF
Open Forest	489.61 km ²	11,489.44 km ²	4.26% of state OF
Total Forest Cover	900.20 km ²	23,765.78 km ²	3.79% of state forest cover
Forest Cover (%)	18.14%	29.81%	11.67 percentage points below state average
Change from 2021	+0.77 km ²	+58.81 km ²	Positive
Scrub	31.07 km ²	558.32 km ²	5.56% of state scrub

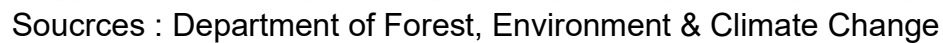
Source: Official Website of Department of Forest, Environment & Climate Change Government of Jharkhand, <https://forest.jharkhand.gov.in>

Types and Distribution of Forests in Giridih District

The forests of Giridih district are predominantly tropical deciduous in character and are distributed across a varied landscape of hills, undulating plateaus, valleys, and relatively level tracts. Sal (*Shorea robusta*) is the dominant tree species and forms the characteristic vegetation of the district. Other commonly occurring species include mahua, bamboo, khair, salai, simul, palas, kusum, kend, asan, piar, and bhelwa. The presence of mahua, kend, piar and other useful species is particularly significant from the perspective of forest-based edible resources and the livelihood requirements of local communities.

Administratively, the forests are managed under two divisions—Giridih East Forest Division and Giridih West Forest Division. Giridih East is the larger division and covers forest areas across much of the district except parts of the western and central region. It comprises five forest ranges: Giridih, Gawan, Dumri, Khurchutta, and Parasnath. According to the working-plan data, the division contains 122,042.53 hectares of notified and demarcated forest land. Of this, Protected Forest constitutes the largest category with 98,276.52 hectares, followed by 14,681.02 hectares of undemarcated forest, 4,778.41 hectares of Reserved Forest, and 4,306.58 hectares of demarcated but unnotified forest. Gawan Range has the largest forest area at 57,211.39 hectares, followed by Giridih (22,750.22 ha), Khurchutta (21,136.31 ha), Dumri (13,909.02 ha), and Parasnath (7,035.59 ha).

Giridih West Forest Division covers approximately 16,242.01 hectares, mainly distributed across Jamua, Dhanwar, and parts of Birni and Deori blocks. Forest distribution is strongly influenced by relief. Gawan, Dumri, Parasnath, Tisri, and Pirtand contain extensive hilly and sloping forest tracts, whereas Jamua, Dhanwar, Bagodar, and Bengabad are comparatively level and have greater agricultural land. Thus, Giridih displays an uneven but geographically diverse forest distribution, with the eastern and hilly parts forming the principal concentration of its forest resources.



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Factors Influencing Forest Cover in Giridih District

The distribution and characteristics of forest cover in Giridih district are influenced by a combination of physiographic, climatic, hydrological, soil-related, and human factors. Topography is one of the most important determinants. Giridih forms part of the Chota Nagpur Plateau and consists of the Central and Lower Plateau regions characterized by hills, valleys, slopes, and undulating surfaces. Elevated and relatively inaccessible areas, particularly around Parasnath and other hill ranges, provide favourable conditions for the preservation of natural vegetation, while comparatively level areas are more extensively utilized for agriculture and settlements.

Climate also plays an important role in determining the nature of vegetation. Giridih experiences a tropical monsoon climate with hot summers, seasonal rainfall, and comparatively pleasant winters (Gupta et. al., 2024). Rainfall during June to September supplies the moisture required for the regeneration and growth of deciduous vegetation. Seasonal variations in temperature and moisture favour tropical deciduous species, particularly sal, which is widely distributed throughout the district. Relief and altitude create local variations in temperature, moisture availability, and vegetation. Higher elevations generally experience relatively lower temperatures, while hill slopes provide different ecological conditions from valleys and plains. Rivers and drainage systems, particularly the Usri, Barakar, and Sakri, also influence vegetation by maintaining local soil moisture and supporting plant growth in adjoining areas (Kumar et. al., 2025)

Soil and geological conditions further affect forest distribution. The predominantly rocky and plateau terrain limits intensive cultivation in several hilly areas and consequently favours the persistence of forests. Mineral-rich geological formations also characterize substantial parts of Giridih. In recent years human activities significantly modify natural forest cover. Expansion of agriculture, urban settlements, mining and mineral extraction, fuelwood collection, grazing, and infrastructure development may reduce or fragment forests. Conversely, afforestation, forest protection, controlled resource utilization, and conservation measures can contribute to their regeneration. Thus, the present pattern of forest cover in Giridih represents the combined influence of natural environmental conditions and continuing human intervention.

Forest Cover as a Source of Edible Plants

Forests of Giridih district are one of the main natural sources of medical as well as edible plant materials for those communities who reside in forest or near the forest area (Farooque & Singh, 2024). The tropical deciduous forest types of Giridih district provide a wide range of trees, shrubs, herbs, climbers, and seasonal plants which produce fruits, flowers, leaves, seeds, roots, and tubers that can be eaten by people. The availability of these resources is linked to the diversity of forest cover. Very dense and moderately dense forests are more stable habitats for perennial trees whereas open forests and forest edges are the places where enough sunlight penetrates into and supports the growth of many grasses, herbs, shrubs, and climbers. The vast forest cover in Gawan, Giridih, Khurchutta, Dumri, Parasnath, Tisri, and Pirtand makes it a suitable place for edible plants.

Forest-based edible plants play a vital role socio-economically and culturally in Giridih district. The rural and forest-dependent households collect various fruits, flowers, leaves, seeds, mushrooms, tubers, and other non-timber forest products for household consumption or selling in local markets in some cases. These products add to the diet of agricultural crops, especially in particular seasons. Various species of mahua, kend, piar, kusum, and other native species are the best examples of the association of the forest cover with the traditional food practices of the people. However, the availability of edible plants is determined by the protection of their natural habitat. The processes of degradation of the forests, over-extraction, fire, grazing, cultivation, and regeneration disturbance could negatively impact these resources. Thus, it is very important to maintain the diversity of forest cover for not only ecological balance but also preservation of indigenous food resources.

Important Edible Plants and Their Distribution

A number of plants growing in natural conditions in the district of Giridih serve as sources of various edible products – fruits, flowers, seeds, shoots, etc. For example, mahua (*Madhuca longifolia*) is one of the important trees that produce edible flowers used to make different types of food. Other examples include kend (*Diospyros melanoxylon*) that produces edible seasonal fruits; piar/chironji (*Buchanania lanzan*) producing edible fruits and edible kernels; jamun (*Syzygium cumini*) widely used for its delicious seasonal fruits; jangli khajur (*Phoenix sylvestris*) producing edible small fruits and sap used traditionally; dumar/gular (*Ficus racemosa*) producing edible clusters of fruits that grow in comparatively moist areas; jangli ber (*Ziziphus* spp.) representing an important wild fruit growing in open forests, scrubs, forest edges, and comparatively dry areas. Small fruits of the last one are generally consumed when ripe and represent a seasonal food product of the area. Other edible plants of the district include kusum (*Schleichera oleosa*) which produces fruits and seeds used to obtain oil; tender bamboo shoots that also have some food applications. Finally, bhelwa (*Semecarpus anacardium*) is another typical forest tree whose parts need special processing due to irritant elements contained in the plant.

The distribution of these edible plants differs depending on the density of the forest, relief, soil conditions, availability of moisture, human impact, etc. The dense forests of Gawan provide good habitats for mahua, kend, piar, jamun, bhelwa, and other deciduous plants. Hilly and wooded areas of Parasnath, Dumri, Tisri, and Pirtand also offer suitable habitats for a great number of wild edible plants. Jamun and dumar are usually found in comparatively moist areas, valleys, streams, and areas with water presence, while jangli ber and jangli khajur are adapted to open forests, dry slopes, scrub, and forest edges. Giridih and Khurchutta ranges contain mixed deciduous vegetation of lower hills and gentle slopes. Forest patches of Jamua, Dhanwar, Birni, and Deori provide additional habitat for these edible plants in western Giridih.

Conclusion

The study reveals that forest cover constitutes an important component of the natural landscape and ecological resources of Giridih district. According to the 2023 assessment, the district has 900.20 km² of forest cover, representing 18.14 percent of its geographical area. Although this proportion is lower than the Jharkhand average,

the forests of Giridih exhibit considerable diversity in terms of density, terrain, and vegetation. Open forest constitutes the largest category, followed by moderately dense and very dense forests. Administratively, these forests are managed under Giridih East and Giridih West Forest Divisions, with extensive forest tracts occurring particularly in Gawan, Giridih, Khurchutta, Dumri, Parasnath, Tisri, and Pirtand areas. The distribution of forests is largely influenced by plateau topography, hills and slopes, climatic conditions, drainage, soil characteristics, and human activities.

The study further indicates that these varied forest environments provide suitable habitats for several edible and economically useful plant species, including mahua, kend, piar/chironji, jamun, jangli khajur, dumar/gular, jangli ber, kusum, bamboo, and bhelwa. These resources have ecological as well as livelihood significance for local communities. Therefore, conservation of existing forests, restoration of degraded and scrub areas, sustainable harvesting, and documentation of traditional knowledge are essential. Further field-based botanical research is required to determine the precise distribution, abundance, nutritional properties, and sustainable utilization potential of edible plants in Giridih district.

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