

A STUDY ON THE FLORA AND FAUNA OF RAJAJI NATIONAL PARK

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Abstract

One hundred and twenty-two national parks and ninety-two wildlife sanctuaries may be found throughout India's eleven Himalayan states. Six national parks and six wildlife sanctuaries have been formed in the state of Uttarakhand, which is located in the Himalayas in northern India. These parks and sanctuaries were founded by both domestic and international groups. These areas are among the most breathtaking tourist destinations in the country and around the world. They attract tourists who are interested in learning about and supporting the preservation of the natural world's history. This is because these locations have been preserved. Pauri, Haridwar, and Dehradun are the three districts that make up Rajaji National Park. This park is well-known for its breathtaking scenery, great variety of flora and animals, and topographic terrain. Between the latitudes of 29° 56' 40" North and 30° 20' North, and between the longitudes of 79° 01' 15" East and 78° 01' 15" East, it is located. It encompasses an area of around 820 km and is situated in the Gangetic plains, the lower Shiwalik range, and the foothills of nine other forest ranges. From 271 metres to 1381 metres above mean sea level, the park's topographical relief varies from one mountain to another. The Ganga River flows through the park from north to south, passing through the Shiwalik range at the northeast end of the park and forming a flood plain in the south. The Shiwalik range cuts across the park from east to west. Through the utilisation of remote sensing and GIS geospatial technologies and methodologies, several aspects of the park have been analysed in detail. These aspects include the topography, the vegetative cover and species, the fauna species, the climate, the accommodation possibilities, the transportation options, and the tourist attractions.

Keywords: *Techniques of Geographical Analysis and Biodiversity.*

INTRODUCTION

The concept at hand A condensed form of ecological tourism, ecotourism is concerned with appreciating and protecting the unconstrained nature of travel. Ecotourism is a smaller kind of ecological tourism. According to the International Union for the Conservation of Nature (IUNC), ecotourism is defined as the practice of taking enjoyment in the process of advocating for the preservation of environmentally and culturally significant resources. This involves reducing the negative influence that tourists have on the community while

simultaneously delivering economic benefits to the area. In addition, ecotourism is a term that emphasises responsible travel that reduces the amount of negative impact that it has on the place.

Ecotourism is a form of tourism that takes place in beautiful, natural settings that have not been altered in any way. This definition and set of guiding principles for ecotourism was developed by The International Ecotourism Society (TIES) in the year 1990. It states that ecotourism is "responsible travel to natural areas that conserves the environment and improves the well-being of local people." TIES, 1990 (Year) (2013) According to Mansoori, Jaybhaye, and Sayyed. The varied terrain and geographical characteristics of the Himalayan area are factors that contribute to the region's very high degree of natural biodiversity. Because of the area's breathtaking natural beauty, it is a popular destination for tourists. It is illustrative of the conservative mentality that exists within the visit communities. RAJAJI NATIONAL PARK: A GEOSPATIAL EXAMINATION vOlUme-7 | issUe-10 | Published in July of 2018 The Aesthetics of Ecotourism and Current Prospects available over the internet at www.lbp.world 2, with an emphasis on sustainable practices. Because of the wide variety of its flora, wildlife, and animals Its topography is one of the primary reasons that people come to visit the region. All of the states of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Assam, Arunachal Pradesh, Nagaland, Manipur, and Mizoram were included in the Himalayan region, which extended from west to east. There are six animal sanctuaries and five national parks located in the state of Uttarakhand, which is located in the Himalayan region of India. Uttarakhand is mostly attractive due to the natural surroundings that it has, including the Terai, the Bhabhar, and the Indian Himalaya. There are four distinct regions within the Himalayan region, which are referred to as Shiwalik, Lesser Himalaya, Greater Himalaya, and Trans Himalayan. These regions are differentiated from south to north based on their distinctive physiographic features. The state of Uttarakhand is a region that is abundant in natural resources, cultural legacy, and religious variety, which makes it an attractive destination for travellers. There are several different types of tourism that may be enjoyed in the state of Uttarakhand, including ecotourism, ecotourism, adventure tourism, cultural tourism, and nature and wildlife tourism. The master plan for the Uttarakhand Tourism Department Board (2007–2022) places a significant emphasis on the necessity of these tourism activities in the state as well as their expansion. The goal of this plan is to attract a greater number of tourists from both domestic and international markets, as well as to strengthen the state's infrastructure and employment opportunities.

The state of Uttarakhand is home to Rajaji National Park, which is a component of the Indus-Ganges Monsoon Forest Bio-geographical Province. The park is situated in the Shiwalik range and the Piedmont region of the Himalaya. Chilla, Motichur, and Rajaji are two of the sanctuaries that are included in this place. This is Singh Rakesh K. With a wild population that is both vast and numerous RJNP is one of the countries in Northern India that is most deserved of being a tourist destination. The RJNP is being promoted as a destination for ecotourism due to the presence of megafauna like as tigers, leopards, and elephants, in addition to the typical regional richness of plant species. The Rajaji-Corbett Elephant Reserve, which is located in Northwest India and contains Rajaji National Park, is an important site for the conservation of elephants. There are around ninety percent of the elephant population in the Northwest that may be found in the Rajaji-Corbett Elephant Reserve. According to Johnsingh and Williams (1999), there are known dangers to the elephant population in the park's eastern section, which has around 200 elephants, and western region, which contains approximately 400–500 elephants. These two regions are separated by the Ganga River. RJNP was designated as a Tiger Reserve on April 20, 2015,

by the National Tiger Conservation Authority/Project Tiger, which is a statute authority that falls under the Ministry of Environment, Forests, and Climate Change of the Government of India. By virtue of this, RJNP is now the 48th Tiger Reserve in India and the second Tiger Reserve in the state of Uttarakhand, with Jim Corbett being the first Tiger Reserve in the state. Royal Jungle National Park is a well-liked tourism site for people who have an interest in wildlife and who wish to have a close-up look at tigers. As a result of its proclamation, the Raja Ji Tiger Reserve has extended to encompass a total area of 1075 km². The previous area was 820 km². It was discovered that there were eighteen tigers in the buffer zone of Rajaji National Park (RJNP).

requesting assistance from the government in terms of supplying workers and other resources. Money has been made in a number of different situations. The great value of ecosystems is obtained by donations, taxes, and entry fees; yet, it is argued that these contributions to global ecosystems are minimal on an annual basis. Ecosystems are extremely valuable. supplying mankind with services of at least 33 trillion dollars in the United States (Constanza et al., 1997). Regarded as one of the most popular destinations among these ecosystems is Rajaji National Park (RNP). As a result of the fact that forests in India provide services that Asian elephants (*Elephas maximus*) are unable to properly replace, these forests are the most valuable terrestrial habitat for nature-based tourism. The Asian elephant has been classified as an endangered species (Pattaknayak and Burty, 2005). This classification is a result of the rapid advancement of technology and the declining population of it. As of the year 1973, more than one hundred thousand protected areas have been constructed all over the world in order to rescue endangered species. These protected areas cover more than twelve percent of the surface area of the earth (World Wildlife Fund, Convention on International Trade in Endangered 2010). There are opportunities for CITES-listed species of wild flora and fauna in rural regions that are given by protected areas.

Based on the present development and the prudent utilisation of marginal land, it is estimated that the Asian elephant population across the world is responsible for the creation of between 20,000 and 25,000 jobs and the generation of a significant amount of revenue (WWF, 2014). In spite of the fact that elephants are regarded as significant resources for the tourism activities they offer, they are also respected for their monitoring, conservation education, and entertaining qualities (CBD, 2001). The economic benefits of protected places, whether they are used or not used, may be enjoyed by a wide variety of individuals if they are managed in a sustainable manner. According to Munasinghe and McNeely (1994), a significant number of local farmers hold the view that elephants pose a significant danger to their livelihoods, both directly and indirectly. They consider elephants to be an agricultural pest (Bandara and Tisdell, 2003).

Both politicians and environmentalists have expressed their satisfaction with the rise in the number of elephants in Botswana, which has been seen since 1998 and has the potential to have a substantial influence on the economics of developing countries (Benavides and Perez-Ducy, 2001). The profusion of protected places for in situ conservation in northern Botswana, India, makes it difficult for large numbers of elephants, who are responsible for destroying crops and putting people in peril, to coexist with these protected areas. In 2010, the World Bank reported that India's protected areas are as follows: In response, the state narrowly established in 2008 a compensation policy that occupied around 6.21% of the entire surface area. This policy strengthened the government's control over wildlife in the nation, with a terrestrial share of 4.77% and a marine share of 1.46%, while communities that were touched by such accounted for 1.46% of the total.

Three regions in India are considered to be "human-elephant conflict demand increased rights the world," and the Himalayan region is home to these areas. These areas are among the 25 "biodiversity hot-spots" that are located all over the world. According to Mandal (2003), elephants in the Western Ghats and the Indo-Burma Himalayas are a symbol of regions of disagreement between the state and the region. More often than not, the funding for these parks comes from the communities that are located nearby, which can only be fully understood. Not only is the Himalaya recognised for its extensive biodiversity, but it is also renowned for its diverse cultural mix. Over 18,440 plant species, 979 animal species, and 979 mammalian species call this place home. The Protected Area Network (PAN) programme in the state of Uttarakhand has been successful in protecting the parts of the Indian Himalayan region that are reflective of the region's great biological abundance. It is estimated that protected forests account for around 28.52 percent of the total woody land in the country. It is estimated that almost ninety percent of the state's 750 elephants are located in the reserve forests that are adjacent to the state as well as the well-known Rajaji-Corbett Tiger Reserve. These two reserves, when combined, constitute the second-largest protected territory in the state of Uttarakhand, behind the Corbett Tiger Reserve. According to a research conducted by the forest department in 2015, there are around 1839 elephants that may be located in Uttarakhand. Within the reserve, the Chilla range is considered to be one of the most popular tourist locations. In addition to a number of other wild animals, such as the *Panthera tigris*, the *Panthera pardus*, the *Melursus ursinus*, the *Hyaena hyaena*, the *Muntiacus muntjak*, the *Nemorhaedus goral*, the *Axis axis*, the *Cervus unicolor*, the *Sus scrofa*, and the *Ophiophagus Hannah*, the whole belt is home to the *Elephas maximus* in its natural environment. In addition to this, the tiger reserve serves as the westernmost frontier of the range of the tiger, elephant, and king cobra.

The Rajaji National Park was named after Rajaji C. Rajagopalachari, who was the first Governor General of independent India. Rajaji was also lovingly known as Rajaji. Rajaji Sanctuary, which was founded in the state of Uttarakhand at his request, was one of the component units via amalgamation that were included in the creation of the National Park in the year 1983. Information on the Rajaji Sanctuary's plan to become a national park was sent to the sanctuary on August 12, 1983. In order to ensure that the tiger population remains in good condition, the area was subsequently dubbed the Rajaji Tiger Reserve. The entire region is comprised of the Shivalik range, which is situated in close proximity to the Himalayan foothills and extends across an area of 820.42 square kilometres throughout the three districts of Dehradun, Haridwar, and Pauri Garhwal. In the Shivalik terai, which is located between the Sharda and Yamuna rivers, the RTR is an essential component of the landscape. The Chilla forest range of the RTR is located between 302 and 1000 metres above sea level. It is related to the Garhwal Forest Division and is located to the east of the Ganges River. Within the reserve, the Chilla range is considered to be one of the most popular tourist locations. As it travels from the Dehradun-Saharanpur road in the northwest to the Rawasan River in the southeast, the RTR traverses the Shivalic range, which is located within the Gangetic biogeographic zone. Within the Shivalik region, there is a large amount of floristic diversity due to the fact that RTR has a very variable topography, height, and temperature.

The reserve has ten forest ranges, each of which makes a major contribution to the preservation of biodiversity. Within the reserve, the Chilla range is considered to be one of the most popular tourist locations. The RTR is one of a kind since it has a wide range of forest types, each of which contributes to the area's abundant fauna and stunning natural beauty. There are places that are indicative of the Savannah, as well as mixed forests

consisting of Shorea and Mallotus, northern dry deciduous woods, and Acacia-Dalbergia forests. In this region, the weather may be somewhat unpredictable at times. Winter is characterised by pleasant days and nights that are cool but mainly overcast. It lasts from November till February. At the summer months (March to June), the temperature can swiftly rise from 40 to 45 degrees Celsius. However, at this time, there is also an increase in the amount of rainfall and the occurrence of thunderstorms on occasion. During the rainy season, which lasts from July to October, the humidity levels are at their maximum. Every year, the amount of rainfall ranges from 1200 to 1500 millimetres. As a result of the normally poor and infertile soils, the tiger reserve only has a small percentage of the humus that has constructed itself. This region has a long history of being inhabited by people. From the lower foothills to the high Himalayan meadows, buffalo herds travel between the two regions throughout the winter months. A wide variety of Gujjar community villages may be found within the tiger reserve and its surrounding area. The term "Bhabar" is used to refer to both the Shivalik and the Himalayan foothills combined. It is the Asiatic elephants and the abundant animal life that can be seen in the Terai Belt, together with its lush, tall grasses, that attract the majority of tourists travelling to that region.

OBJECTIVES

1. When it comes to the study of plants.
2. To the investigation of the flora and wildlife of Rajaji National Park.

The park's plant life

The Himalayas are home to more than 8,000 different species of flowering plants, of which 1748 are mostly used for medicinal purposes in traditional medicine to treat a wide range of diseases. The Rajaji Tiger Reserve is a showpiece for the diverse and abundant forest ecosystem that it contains. Numerous studies have demonstrated that the forests of the RTR are home to significant plant associations. These associations include the communities of *Syzygiumcummini*, *Terminalia bellerica*, *Terminalia alata*, *Trewia nudiflora*, *Cassia fistula*, and *Flacourtia indica*. Additionally, the communities of *Shorea – Mallotus – Adina*, *Shorea – Terminalia – Bridelia*, and *Dalbergia – Acacia* are also found in the RTR. The ranges of the RTR are home to a remarkably diverse collection of plant species. The Chilla Forest Division is a part of the protected area network; however, the area is experiencing rapid changes in its biological status as well as the patterns of its flora and fauna as a result of extensive human forcing in certain areas. These human forcing activities include grazing, lopping, hydropower projects, scraping, trampling, and the extraction of non-timber products. The RTR, on the other hand, maintains its integrity precisely because of the immense forest that it contains.

It is possible to categorise the Sal forest as either a tropical dry deciduous woodland or a tropical wet deciduous forest. The Sal forest makes up the majority of the park. Among the tree species that predominate in the tropical wet deciduous forest, *Shorea robusta* is the most common. This species thrives in concentrated areas. There are a number of common species that are associated with the Sal forest. These include *Terminalia alata*, *Anogeissus latifolia*, *Adina cordifolia*, *Terminalia bellerica*, *Lannea coromandelica*, *Garuga pinnata*, *Sterospermum suaveolens*, and *Mallotus philipensis*. On the other hand, the tropical dry deciduous forest is home to a number of species, including *Terminalia bellerica*, *Cassia fistula*, *Mallotus philipensis*, *Bombex ceiba*, and others. In the park's mixed forest, some of the plants that are commonly found include *Anogeissus latifolia*, *Albiza procera*, *Mallotus philipensis*, *Bombex ceiba*, *Terminalia bellerica*, *Acacia catechu*, *Mitragyna parviflora*, *Erythrina*

suberosa, Embilica officinalis, Bredelia squamosa, Gmelina arborea, Listea glutinosa, Trewia nudiflora, Cassia fistula, Sterculia villosa, Zizypus xylopyra, Z. Mauritiana, Butea monosperma, and other species. Additionally, the diverse activities of the humans constituted a risk to the species depletion that was occurring within the ecology of the mixed forest. Riverine forests are located in low-lying, wet areas near nullahs, riverbands, and streambeds. These woods are made up of evergreen species that are able to withstand the dampness that is present in the inhabited zones. This forest is home to a number of common species, including Syzium cumini, Ficus racemosa, Bischofia javanica, Trewia nudiflora, Pterospermum acrifolium, Albizzia procera, Toona ciliata, and Calamus tenuis, amongst others.

In many cases, the park's scrub forest is a representation of the degradation of dry deciduous forests that is caused by biotic stressors such as overgrazing, lopping, falling, and fires. Among the most important tree species that may be found in this forest are the following: Aegle marmelos, Lannea coromandelica, Erythrina suberosa, Cassia fistula, Flacourtia indica, Zizypus mauritiana, and Z. xylopora.

One of the other plant communities in the park is called Savannah (Grassland), and it came into being as a consequence of a number of disturbances to the natural flora, including disruptions caused by humans. At this point in the park, it is not considered to be a peak stage. The significant plant species of the grassland community are Desmostachya bipinnata, Phragmites karka, Cymbogon flexuosus, Digitaria spp., Eragrostis japonica, E. tennela, Setaria spp., Vetiveria zizanioides, Heteropogon contortus, Butea monosperma, Acacia catechu, Helicteres isora, Carrisa opaca, and Dendrocalamus strictus. In the subtropical region, the pine forest may be found between the sal woods and the dry deciduous forests. Despite the fact that its distribution is quite limited, Pinus roxburghii may be found growing in stunted forests that are interspersed with the upper slopes of the Shivaliks.

Potential for ecotourism in Rajaji Tiger Reserve

Beginning on the 15th of November and continuing until the 15th of June of each year, the Rajaji Tiger Reserve is available to visitors. Since the beginning of the last six years, the three mountain ranges of the RTR, namely Chilla, Motichur, and Ramgarh, have been accessible to tourists. Since the previous six years, the remaining seven ranges of the tiger reserve have not been opened to the public because of the deep forest and the existence of the biodiversity. There are a lot of trails in some regions of the reserve, and these trails offer a significant potential for ecotourism operations. The Asiatic elephant is one of the most popular tourist attractions, and during the time period in which the park is available to visitors, the sighting of elephants is more likely to occur. This is especially true in the Chilla and Motichur forest divisions.

On the other hand, the existence of tigers and leopards also guarantees the viability of the region for the potentialities of ecotourism. The Motichur forest and the Chilla forest of the Tiger Reserve have recently been the focal point of interest for tourists. This is due to the fact that about 90 percent of tourists visit the reserve annually in order to experience animal safaris and scenic beauty. Some of the places inside the tiger reserve might be selected and diverted for ecotourism purposes with restricted activities by the government. This is because the majority of the sites within the reserve have a typical diversity of species according to geographical

regions (vegetation and fauna, differences in terrain). There is a significant potential for tourism in the tiger reserve, particularly in the areas of elephant safaris, bird viewing, and the appreciation of natural beauty.

Due to the fact that the Chilla and Motichur ranges include a large number of different species of birds, bird watching has become a popular activity all over the world and is considered an essential component for researchers and scientists. When it comes to bird viewing, the months of October and March do exceptionally well. The vast majority of the birds are individuals that migrate and arrive in this region from the northern region of the United States of America, south-eastern China, Europe, Russia, and other areas that experience extremely cold weather conditions during the winter months. The following species of birds are considered to be among the most significant: *Tadorna ferruginea*, *Aythya farrana*, *Anas platyrhynchos*, *Anas acuta*, *Anas clypeata*, *Anser indicus*, *Mycteria leucocephala*, and *Ephippiorhynchus asiaticus*. Tourists pay a significant amount of attention to these stunning birds.

CONCLUSION

In the Rajaji National Park, there is a significant amount of potential for ecotourism activities such as rafting, bird watching, animal viewing, Jeep safaris, and elephant safaris. Other possible activities include scenic beauty and natural heritage. The interpretation of the data led to the accomplishment of these outcomes. Drainage, transport network, physiographic, slope aspect, point of attraction, and floral and faunal richness are all factors that have a significant impact on the potential for ecotourism in the RJNP forest ranges. The study map makes use of a number of different layers, including elevation, drainage, slope aspect, plant cover, road network, point of interest (watchtower, lodging facility), and forest range. For the purpose of assisting in the development of plans and policies for the expansion of ecotourism in RJNP, the current study offers information that is both significant and priceless. It could be advantageous to increase income and work opportunities for residents of the area, as both of these things contribute to the growth of the state economy. To put it simply, ecotourism is an essential component in the ecological well-being of the national park, as well as in the economic development of the community that is located in the surrounding area. The rapid growth in the number of visitors demonstrates that the RJNP is successful in attracting tourists and contributes to the park's development as a sustainable ecotourism destination.

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