

# Anthropogenic Activities Influences the Biodiversity of Protected Area- A view on Rajaji National Park, Uttrakhand

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## Introduction :

Majority reserve areas in India are facing with severe anthropogenic pressures from both in and around the protected area or reserve areas for animals. Vast tracks of forested landscape that once housed these animals have now been lost due to human habitation and extensive urbanization.

The simplest definition of biodiversity is the number of species found in an area. The scientists consider biological diversity as a concept encompassing all the species of plants, animals and micro-organisms and the ecosystems and ecological processes of which they are parts. As the naturalist point out, that 'diversity' is an umbrella term for the degree of nature's variety including both the number and frequency of ecosystems, species and genes in a given assemblage. Biodiversity refers to the totality of all life forms, the different plants, animals and micro-organisms together with ecosystem in which they thrive. Biodiversity also makes the world a more beautiful and existing place to live. Three kinds of biodiversity are essential to preserve ecological system and functions genetic diversity is a measure variety of different versions of the same genus with in individual species; species diversity describes the number of different kinds of organisms within individual communities or ecosystems and third, ecological diversity means the richness and complexity of biological community which have a number of niche, trophic levels and numerous type of ecological systems that trap energy, having a food chain and recycle the bio-materials in this system including biotic and abiotic components to sustain life.

Biodiversity comprising the variability of genes, species and ecosystem not only essential for maintaining the basic process on which life depends but also is key to sustainable development. It not only provides food, medicine and products of commercial and non-commercial use but also maintain life by providing environmental services like air, water quality soil fertility, disease and pest control and waste disposal etc.

Flora and fauna are incredible gift of nature. Due to lot of variation in climatic conditions nature has been generous enough in India in providing a rich variety of flora as well as fauna, which constitute the rich biodiversity of country. Biologist have identified India as one of the 12 mega diversity country of the world (World Resources Institutes, 1995) harboring an estimated 50,000 out of some 10-30 million species of living organism. The unique assemblages of flora and fauna in Himalayan region make it one of the most important biodiversity hotspot in the Indian subcontinent (Badola and Hussain 2003) large numbers of protected area encompassing 9.48% of the regions have been created to conserve this biodiversity and the fragile Himalayan landscape.

The Himalayas are youngest of world's mountain chain and have the highest peaks in the world. In India Himalayas is the most prominent mountain region and covers ca. 18% of the country's 32,87,263 sq. km geographical area. In India subcontinent the Himalayas is well recognized for its rich and diverse biodiversity and for its. Significance providing the life supporting system for several million people in the northern region. Though the Himalayan terrain is bestowed with varied landscape features that provide multitude of habitats to a diverse array of faunal communities yet several factors have led to low abundance and poor conservation status of different animals in the Himalayan region. With the increase in human population the area has undergone rapid degradation, fragmentation and loss of wildlife habitat.

Superimposition of man's patterns of land use and changing lifestyle in response to new world order has created an adverse impact on natural resources all over the world. Large scape clearance of natural habitats uncontrolled exploitation of plants and jungles, encroachment and settlements on nearby areas for the development of townships and industries, all of them have led to degradation, shrinkage and fragmentation of once vast immaculate natural area into small area which is surrounded by all human activities and localities. As a result of this several wildlife species have become extinct and many other are facing serious threats for their existence and survival.

Uttarakhand has a total area of 53,485 sq. km with 34,661 sq. km under forests of which 2,398 sq. km is in the custody of forest department. Total area coming under protected areas is 6479 sq. km of this 4083 sq. km is covered by six national parks and 2396 sq. km by six wild life sanctuaries. The Park is in confrontation with a large resource dependent population and the major activity of biodiversity conservation is in jeopardy. Rajaji National Park of Uttarakhand is representative of the Shivalik landscape, which is

known for its richness of biological diversity as well acute echo fragility. Moreover pockets of dense human population and intense anthropogenic activities surround this park, thereby exerting tremendous pressure on the environment.

Despite such pressure management interventions particularly the successful efforts of relocation of nomadic gujjar community outside the Raja National Park have helped in the conservation of a range of animal species (Chandola, 2006).

Removal of forests, industrilization and agricultural extension has created excessive pressure to the natural habitat of wildlife (Malhotra, 1994).

In past decades, the forest and wildlife had been greatly threatened by encroachment and the acquisition of forest land. The construction of highways in all direction totally fractured the protected area. Gupta and Sharma (1995) reported that the forest loss would lead to the extinction of species and the disruption of vital ecological processes. Singh et.al.(2001) stated human habitation is fast closing in and on the boundaries of many national parks and sanctuaries in India.

#### **Aim of the study :**

It is well known that conservation strategies may be improved if information on species habitat and distribution of habitat is taken into consideration. Bio-diversity comprising the variability of genes, species and ecosystem is essential for maintain the basic process on which life depends and is key to sustainable development. The dense human population and intense anthropogenic activities surround the park, thereby exerting tremendous pressure on the total habitat of park. The present study have been carried out keeping in mind al the pressure on the researve area of park and to get some remdial solutions so that the park shoul be preserved with its biodiversity especially vegetation terrain as the whole animal life cycle of started from the producers in any ecosystem.

#### **Study area:**

Rajaji National Park (RNP) is located between  $77^{\circ}57'77''$  and  $78^{\circ}23'36''$  east and  $30^{\circ}15'50''$  north spread over 820 sq. km. in three district of Haridwar, Dehradun and Pauri Garhwal of Utrakhand state of Northern India.

It is located in the foothill of Himalaya which increases the species diversity of both flora and fauna. The river Ganges divided Rajaji National Park into two portions as it flows through the park for about 20 kms and its riverine vegetation enriched the park for floral as well as faunal diversity. Three sanctuaries in the Dehradun Shivalik area Rajaji,

Motichur and Chilla were amalgamated into a large protected area and named as Rajaji National Park in the year 1983.

### Materials and Methods:

The biotic and abiotic factor of an area plays an important role on the floral and faunal constituents because both are integrated through food chain. A detailed survey was carried out during study period. The climatic condition of RNP is of extreme variation throughout the year. Here the winter is with 4.0<sup>0</sup>C to 5.0<sup>0</sup>C of temperature whereas summer with extreme 45.0<sup>0</sup>C to 48.0<sup>0</sup>C vegetation.

Vegetation is one of the basic components used to define a biological system because it forms life support system for all the members in any ecosystem. According to the forest classification of Champion and Seth (1968) seven types of forest recognized in Rajaji National Park. The Rajaji National Park has an area of 831 sq. km., which is largest for any park in India. The diverse forest ecosystem of the park provides an ideal habitat for fauna of park. The vegetation of RNP is mainly composed of heterogeneous deciduous species of typical and subtropical origin. Rajwar (1984) has attempted a detailed analysis of the biogeographic affinity of the 435 species described for the eastern part of Rajaji National Park.

### Plant species recorded from study area :

S.No.	Botanical Name	Local Name
1	Acacia arabica (Lamk)	Babol
2	Acacia catechu (Linn.)	Khair
3	Bauhinia vatilii	Maljhan
4	Dalbergia sisoo(Roxb)	Shisham
5	Emblica officinalis (gaerth)	Amla
6	Ficus benghalensis (kinn.)	Bargad
7	Ficus glomerata (Roxb)	Gular
8	Pithecellobium dulce (Benth)	Jangal jalebi
	<b>Shrubs and Herbs</b>	
9	Adhytoda zey lanica (cav.)	Bansa
10	Cannabis sativa	Bhang
11	Carisse carandas	Karonda
12	Opuntia dillenii	Nagphana

13	Zizyphas jujuba	Ber
	<b>Bamboo</b>	
14	Dendrocalamus strictus	Bamboo
	<b>Climbers</b>	
15	Tinospora cordifolia	Giloe
16	Vallisneria spiralis (Roth)	Dudhi Bel
	<b>Grass</b>	
17	Centella asiatica (linn)	Brahmi
18	Cynodon dactylon (linn)	Doob ghass
19	Phragmites karka	Sarkanda
20	Saccharum munja (Roub)	Phoos

### Vertebrate species of Park :

The Rajaji National Park is especially enriched with its vertebrate biodiversity. The park is the habitat to cheetal, barking deer, Sambar Deer, wild Boar, Antelopes and the flagship species Asian elephant. Ganga and son rivers flowing through the park, are home to a rich diversity of fish. Rohu Mahaseer, trout are the important fishes which found abundantly while crabs and small fishes also enriched the water bodies.

Reptiles commonly seen in the park comprise of Monitor lizard, numerous types of poisonous and non-poisonous snakes like king cobra, python, common Krait, tortoise etc. Chameleon and geckos is very common in lizards Avifauna is very rich in the park. About 315 species of birds inhabit this park. The Rajaji National Park is the first destination for the migratory birds cross over the Himalayas into the Indian subcontinent.

During study period approx. 115 bird species were recorded from Motichur range and 132 species were seen in Chilla range. In fact both the ranges have almost common species of birds. Generally, the birds are of different status that is migratory, resident and some are riverine. House sparrow, spotted munia, yellow wrail, plain wrail warbler, pied bush chat, black bird, Peacock, black maina, house crow, jungle crow are common birds. Hoopoes are also seen in scattered vegetation area. Near water area sandpiper, little egret, tufted duck, mallard can easily seen during winter. The primates, Rhesus macaque and the Hanuman langur area in maximum number to enrich the species diversity. The other small mammals Indian Hare and Porcupine squirrel are usually present in all ranges of the park.

Moischur-Chilla corridor which is very important for it the movement of elephants and other animals, the frequent movement can be seen easily in this area. The herbivores chital or spotted deer, Hag deer and barking deer was commonly seen in deep forest area.

Antelopes are represented as large Nilgari in more open forests. Gorals is in adequate number and widely distributed in the study area.

The carnivores are jungle cat, jackel, leopard cat, civet are present in all ranges of the Rajaji National Park. The small mammals which are monkey bat, gilhari and Indian hare enriched the mammalian fauna diversity in all the areas of the park.

The forest department relocate the van Gujjars of Rajaji from 1993 and now at present nearly all ranges of the park is evacuated. Despite of this encroachment of forest land and anthropogenic disturbances in and outside the park causes a serious threat to flora as well as fauna of that area.

The traditional cultures in and around protected areas, sanctuaries have evolved practices over the year to promote sustainable use from the conserved natural resources. But it has just the opposite effect as population begins to increase rapidly nearby area. Secondly, the ecotourism also has a great business which regularly disturbed the protected area. Uncontrolled tourism development and impacts can degrade the sustainable and scenic resources of the reserve park. (Chakravarthy, 2003)

The vegetation is seriously declined due to summer fire in the forest and in the grassy area within the forest.

The sum total of study is that the protected area should be least disturbed and the planning and management plan for any area must be strictly followed by the local people as well as government bodies to that the animal's habitat should not be fragmented.

In management plan of RNP for the period 2012-13 to 2021-22, a total of 49 mammalian species were cited (Joshi, 2016). However two locally extinct species (wild dog and hod deer) were made confining the total number to 47.

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