

**19.****ASSESSMENT OF BIODIVERSITY IN RESERVE FOREST  
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**Abstract**

Biodiversity is the term given to the variety of life on Earth and the natural patterns it forms. The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the influence of humans. It forms the web of life of which we are an integral part and upon which we so fully depend. Biological resources are the pillars upon which we build civilizations. Nature's products support such diverse industries as agriculture, cosmetics, pharmaceuticals, pulp and paper, horticulture, construction and waste treatment. The loss of biodiversity threatens our food supplies, opportunities for recreation and tourism, and sources of wood, medicines and energy. It also interferes with essential ecological functions. While the loss of individual species catches our attention, it is the fragmentation, degradation, and outright loss of forests, wetlands, coral reefs, and other ecosystems that poses the gravest threat to biological diversity. While loss of species has always occurred as a natural phenomenon, the pace of extinction has accelerated dramatically as a result of human activity. Ecosystems are being fragmented or eliminated, and innumerable species are in decline or already extinct.

In this context this study has tried to bring out an assessment of the biodiversity in the reserved forest near Kumbhalgarh fort. Kumbhalgarh reserve forests are situated in the Rajsamand district of the southern Rajasthan and form part of Kumbhalgarh wildlife sanctuary.

The hills and forest serve as a barrier, checking the eastward extension of the desert to the east that is more fertile. There are 22 villages within the Kumbhalgarh Wildlife Sanctuary and 138 villages along the periphery primarily inhabited by tribal communities (Garasiya and Bhils) critically dependent on forests for food, fodder, water, timber and firewood. It is home to a very large variety of wild life, some of which are highly endangered species such as *Sterculia urens*, *Schrebera swietenoides*, *Toona ciliata*, *Jasminum grandiflorum*, *Caesalpinia decapetala*, Starred Tortoise, Marsh Crocodile or Mugger, Longbilled Vulture, White-rumped Vulture, Grey Junglefowl, Aravalli Red Spurfowl, Pangolin, Sloth Bear and the Leopard. Also its pivot location amidst the Aravalis and the age old symbiotic relationship in which its inhabitants mostly tribals , are living with the nature , warrants a detailed analysis and assessment of its biodiversity. Kumbhalgarh wildlife sanctuary is important as it forms an ecotone between hill forests of Aravallis and Thar Desert located in the west.

The study area has some of the threatened species which includes some of the avian fauna also. The present study has tried to assess the biodiversity of the said area in its totality ie Faunal diversity as well as Floral diversity (Undergrowth, ground flora and climbers are also included). The study found that though the area is well preserved both legally and administratively but the increasing pressure of local livestock and the unchecked grazing is putting pressure on the floral diversity of the area which already is in a precarious state. The study highlighted the need to protect and restore the biological value of degraded forests, restore the ecological services they provide and the vital role they play in the livelihoods of the communities dwelling in these forests since many generations.

**Key Words:** Biodiversity, Kumbhalgarh wild life sanctuary, forests, Rajasthan, Aravalis.

**Introduction**

Biodiversity refers to the variety and variability among living organisms and the ecological complexes in which they occur. The site of occurrence of species is

determined by the environment conditions of the site and the range of tolerance of the species. Human population depends on the biodiversity for food and other necessities. The increasing human population is depleting natural resources and causing pollution.

In view of this reality, the biologically rich and unique habitats are being destroyed, fragmented and degraded. The loss of biodiversity prevents evolutionary capacity of biota to cope up with environmental changes. Thus the major challenge to science is to check the loss of species and erosion of gene pool.

The area under study forms an important part of the Kumbhalgarh wild life sanctuary and surround the kumbhalgarh fort famous for its historical aspects, architecture and its aesthetic value. KWLS is important as it forms an ecotone between hill forests of Aravallis and Thar Desert located in the west, serves as a barrier, checking the eastward extension of the desert. The Aravali is an important water divide between Ganga and Indus basin and also exerts a considerable control over the rainfall in northern and eastern Rajasthan. Therefore any disturbance in the ecological equilibrium in the Aravalli region can result into degradation of environment in wider and extensive areas of north Indian plain comprising of eastern Rajasthan and other regions. The occurrence of normal rainfall in north west India much depend on the preservation of lush green forest cover and resultant normal evapo-transpiration process over the aravalli region.

### Study Area

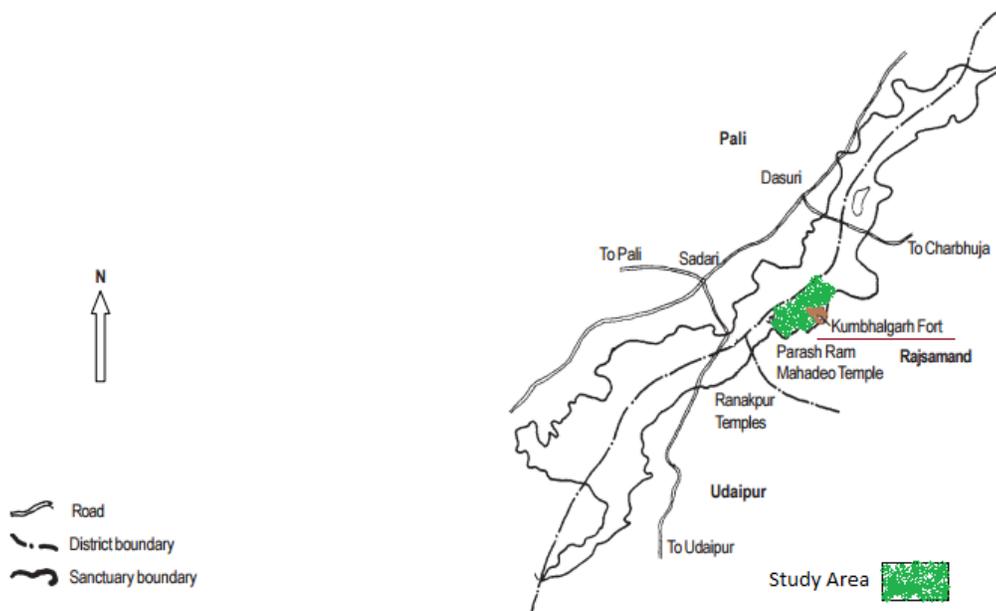
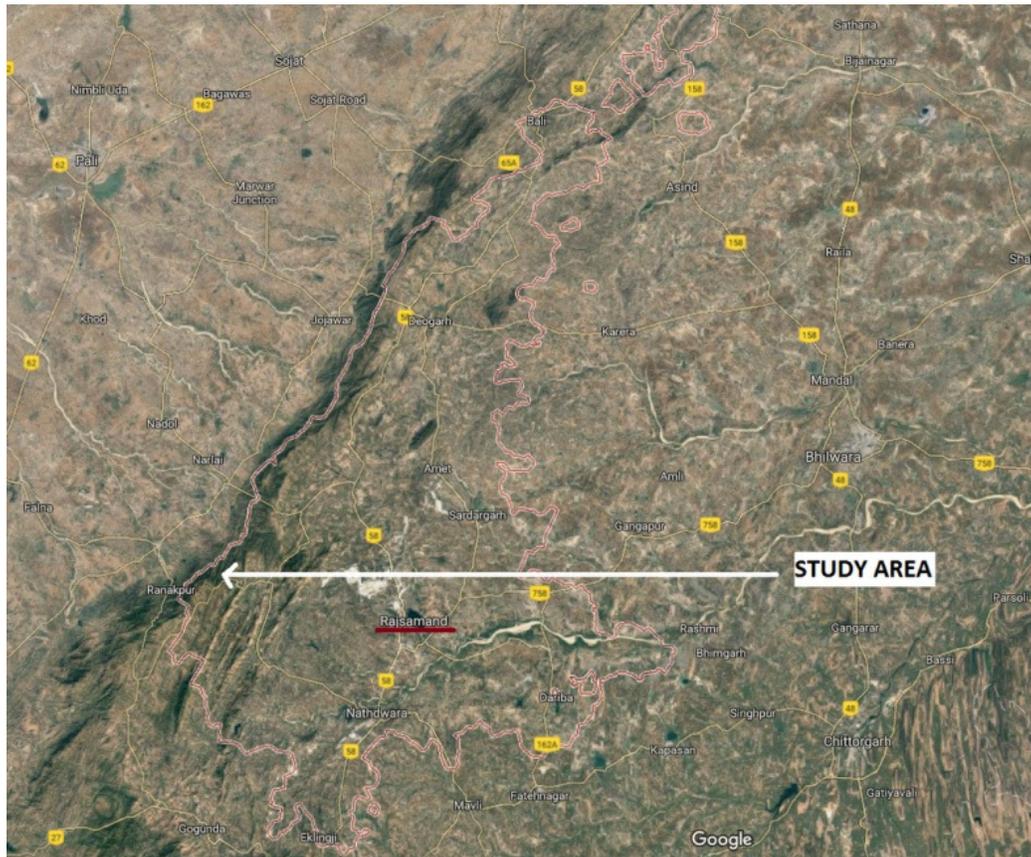


Figure 1. Reserve Forest near Kumbhalgarh Fort

This study was done in the reserve forests near Kumbhalgarh fort in Kumbhalgarh wildlife sanctuary of Rajasthan, located fully in the middle of the Aravalli Hill Range, unique and diverse of its own. The study area extends to 8 square kms and spreads in a semi circle centered around the Kumbhalgarh fort with the coordinates  $25.1528^{\circ}$  N,  $73.5870^{\circ}$  E. It is located 6 kms from Kumbhalgarh at an altitude of 840 to 990 m , the

relief consists of high hills with varying aspect and a slope of 40 degree. The rocks consists of Aravali granite, quartzite, banded gneissic complex and outcrops of rocks are common. The climate of the study area is sub-tropical characterised by distinct winter, summer and monsoon season, with an average annual rainfall of 725mm. The above mentioned climate and rock type has laid to the formation of greyish brown to reddish sandy loam soil where soil cover exists between 15 to 60 cm depth at different sites. The study region has mixed dry deciduous forests with the dominating species as *Boswelli serrata* and *Lanea coromandelica*.



## Methodology

The methodology adopted for the study includes the first step of analysis and assessment of biodiversity in the region through field visits to understand the existing status and causes of degradation of biodiversity. Data pertaining to all related aspects of biodiversity have been collected from books, gazetteers, forest working plans, scientific monographs, journals, research papers and library records. The compilation of collected information has been done by collecting and collating material relevant for the study from diverse sources.

## Result

### Faunal Diversity

Amongst the carnivorous Panther (*Panthera pardus*) is the highest predator, other carnivorous and omnivorous includes wolf (*Canis lupus*), hyena (*Hyaena hyaena*),

fox( *Vulpur bengalensis*), jungle cat(*Felis chaus*), sloth bear(*Melursus ursinus*), palm civet(*Paradxcorus hermaphroditus*), wild boar(*Sus scrofa*). Amongst herbivorous the main species are Hanuman langur( *Semnopithehcus entellus*), Blue bull ( *Boselaphus tragocemalus*), Sambhar(*Cervus unicolour*), Chinkara(*Gazella gazella*).

Though a large variety of birds are found in the sanctuary but some species such as Gups Bengalensis, gyps indicus, Sarcogups Calcus, Parus Nuchalis are among the threatened species of the world which are noticed in the study area.

### Floral Diversity

Description of stand top storey	Average height 9 meters	Density 0.6
	Species species	Percentage of
	Boswellia Serrata	30
	Lunnea coromandelic	20
	Anogeissus latifolia	20
	Sterculia urens	All 30 percent
	Zizyphus glaberrima	
	Bombax seiba	
	Acacia catechu	
	Dalbergia odoratissima	
	Zizyphus mauratiana	
	Saymida febrifuga	
	Ficus benghalensis	
	Emblica officinalis	
	Terminalia balerica	
	Albizzia procera	
	Pondamia glabra	
	Hymendictyon excelsum	
	Mitragyna parvifolia	



<b>Ground flora</b>	<p><b>Rich consisting of</b> <i>Bidens biternata</i>, <i>Eniscostema hyssopifolium</i>, <i>Tridax procumbens</i>, <i>Euphorbia hirta</i>, <i>Pavonia ororata</i>, <i>Abutilon indicum</i>, <i>Oxalis corniculata</i>, <i>Achyranthes aspera</i>, <i>Cassia tora</i>, <i>Indigofera hirsute</i>.</p> <p>Among grasses the common species are <i>Apluda mutica</i>, <i>Sehima nervosum</i>, <i>Themeda quadrivalvis</i>, <i>Heteropogon contortus</i>, <i>Cymbopogon martini</i>, <i>Setaria glauca</i>, <i>Cynodon dactylon</i>. In open patches, the grass species are about 0.60 cm high but on the whole, they are light.</p>
<b>Climbers</b>	<p><i>Dioscorea bulbifera</i>, <i>Capparis sepiaria</i>, <i>Aristolochia</i>, <i>Ampelocissus semicordata</i>, <i>Arbus prectoris</i>, <i>Cryptolepis buchani</i>, <i>Ficus glomerata</i>, <i>Pongamia glabra</i>, <i>Haloptelea integrifolia</i>, <i>Syzygium cuminii</i>, <i>Terminalia belerica</i>, <i>Mitragyana parvifolia</i>.</p>

### **Biotic factors**

This is a reserve forest but grazing is uninterrupted, which is the worst situation like all other forest area controlled by the forest department. Due to poor depth of soil except in some pockets, species do not attend their maximum heights. Though the Government has prohibited any type of construction and other activities in the vicinity of reserved area but there are still other problems which are yet to be addressed such as the diseases (Bacterial, Viral, Protozoan, Helminthes) which spread due to the interaction of wild species with the local livestock population and the occasional forest fire.

### **Final Remarks**

The study area constitute the highest hills of the district, but grazing by small livestock like sheep and goat is hindrance in maintenance and growth of plant species. Many wild plants of medicinal value germinate in this region, which can be helpful to the local people and of national importance but loss of biodiversity is the basic concern, which need to be addressed in the best interest of the area. This is also a tourism hotspot of Rajasthan and a very significant place of historical importance, therefore all measures should be taken to ensure that along with the promotion of tourism the biodiversity and serenity of the area should also be maintained. Though the study area is a highly monitored and a reserved forest but still there is a great need to educate the populace about the ecological services forest provides to them and the vital role they play in their livelihoods since many generations.

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