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ECOLOGICAL STUDY OF TAL CHHAPAR SANCTUARY, CHURU (RAJASTHAN)

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Abstract: *The variety of life on Earth, or its biological diversity, is commonly referred to as biodiversity. The number of species of plants, animals, and microorganisms, the enormous diversity of genes in these species, the different ecosystems on the planet, such as deserts, rainforests and coral reefs are all part of a biologically diverse Earth. Appropriate conservation and sustainable development strategies attempt to recognize this as being integral to any approach. Almost all cultures have in some way or other form recognized the importance that nature, and its biological diversity has had upon them and the need to maintain it. Yet, power, greed and politics have affected the precarious balance. Biodiversity is the vast array of all the species of plants, animals, insects, and the micro organism inhabiting the earth either in the aquatic or the terrestrial habitats. The human civilization depends directly or indirectly upon this biodiversity for their very basic needs of survival viz. food, fodder, fuel, fibre, fertilizer, timber, liquor, rubber, leather, medicines and several other raw materials. This diversity is indispensible for the condition for the long term sustainability of the environment, continuity of the life on earth and the maintenance of its integrity. It is highly "generic" containing vast range of underlying dormant seeds which blooms into colourful ranges of herbs and grasses with the very first shower.*

Key words: Biodiversity, Ecological, Sanctuary, Black buck, Tal Chhapar

Introduction

As many as 500 millions myriad of species of plants, animals and micro organisms inhabited this earth since life began over 3.5 billion years ago. A many of them disappeared from the face of the earth in the normal evolutionary process, some of them have left their descendants and surviving remnants. The "garden lizards" and the "crocodiles" are the surviving remnants of the giant reptiles, the dinosaurs of the Mesozoic age. Though we know of about 1.5 million species today, recent discoveries of astonishing insect diversity in rain forests have forced scientists to revise their estimates. There may be anything between 5 to 50 million species of plants and animals. According to Peter Raven about 100 new species of plants are being discovered every year. Today there are about 30 millions species occupying this planet. However, our ignorance in this area is vast. Some put the figure up to 100 millions. In particular we do not know how much variability exists among soil micro-organisms. Whatever species we see today are not there by any chance, but are the products of long evolutionary process managing to survive through ecological adaptations in the ever changing environmental conditions over time and space.

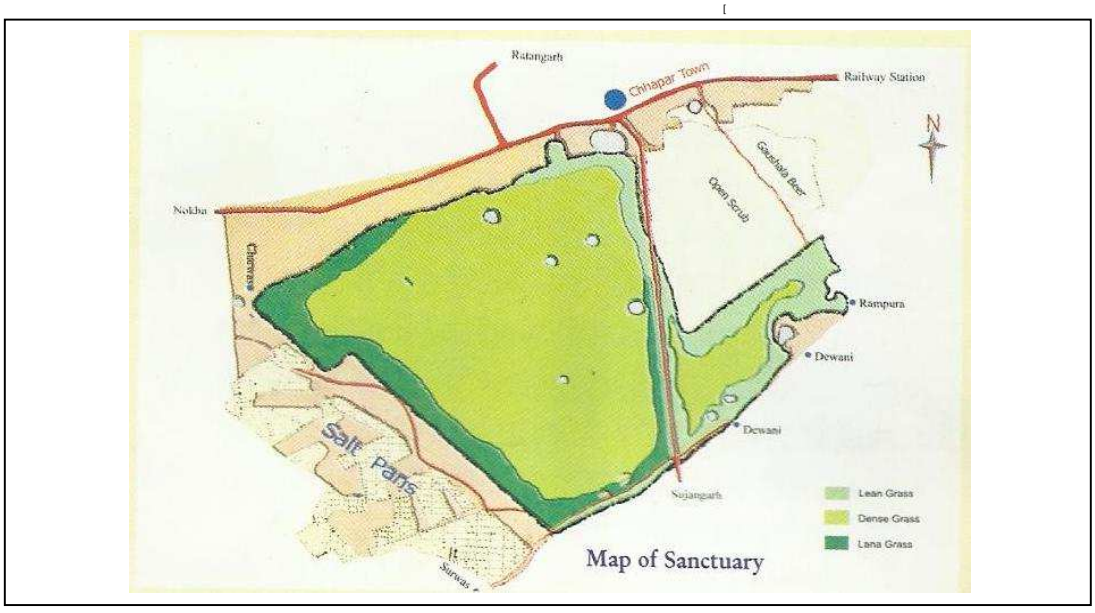
Wild life Diversity in the Thar Desert

The Rajasthan desert is fairly rich in wildlife diversity. While work on invertebrates is still in progress, intensive studies have been carried out on the vertebrates, which show predominant

“Shaharo-Iranian” affinities and are found on a variety of desert habitats, but a few exhibit habitat specificity. The earlier flocks of sand grouse were of the order of 3000 to 4000 birds. Now, they fly in few hundred only. Their population in Barmer, Jaisalmer and Bikaner districts has also been adversely affected due to prolonged droughts which drastically reduced the availability of seeds for them. The tale of the artiodactyles is not much different. During 1890-1900 periods, the herds of black buck in the desert were very large. Now the black buck has almost vanished from the scene except in sanctuaries and around villages of the Bishnoi community. The Indian gazelle or chinkara, which were found in herds of 50 to 100 heads till 1947, are now rarely seen. The major reason of depletion in their number is the paucity of grazing lands in the desert.

Study Area

Churu, itself as the district’s headquarter, is situated in the north eastern part of Rajasthan where mostly arid conditions prevailed. This district falls in the desert tract known as ‘Thar’. The Tal Chhapar sanctuary is located in the Sujangarh *tehsil* of the district at the intersection of 27° 42’ North latitude and 74° 20‘ East longitude. The sanctuary is located at about 286.6 meters from the Mean Sea Level. It is covers an area of 6.94 square kms. The sanctuary lies on Nokha-Sujangarh state highways at a distance of 85 kms from Churu, 160 kms from Bikaner and 200 kms from Jaipur, the state’s Capital city. Tal Chhapar Sanctuary lies in the Shekhawati region Rajasthan. The sanctuary nestles a unique refuge of the most elegant antelopes encountered in India, "the black buck". Tal Chhapar sanctuary, with almost flat tract and interspersed shallow low lying areas, has open grassland with scattered Acacia trees which give it an appearance of a typical Savannah. The word "Tal" means plane land. The rain water flows through shallow low lying areas and collect in the small seasonal water ponds. It lies on the way of the passage of many migratory birds such as harriers. These birds pass through this area during September. Birds commonly seen in the sanctuary are harriers, eastern imperial eagle, tawny eagle, short-toed eagle, sparrow, and little green bee-eaters, black ibis and demoiselle cranes, which stay there till the month of March. On the other hand, skylark, crested lark, ring dove, brown dove and blue jay are seen throughout the year.



Status of Tal Chhapar Wild Life

The Tal Chhapar was declared 'Reserved Area' for the protection of wild animals and birds in 1962. Over 2000 black bucks are found in almost tree less saline flat land of Tal Chhapar sanctuary. This is a natural home of black bucks. There is indication that the population of black bucks is on the way of increase at Tal Chhapar. The main problems of the area are as follows:

1. Cutting of trees and degradation of forest.
2. Uncontrolled grazing
3. Man made element such as road, building watch hut etc
4. Hunting of animals.
5. Developments around sanctuary.
6. Lack of infrastructure facilities like drinking water for animal, proper feeding

Climatic Conditions

Micro-climatic characteristic of Sujangarh Tehsil are of desertic type and erratic, irregular and insufficient precipitation, and by a marked, degree of aridity. The climate elements follow the general seasonal rhythm of the monsoon but they have a great magnitude of variability, both in time and space. Drought and famines are very common, but climatically the area is not a true desert (Stein 1942). Yet the fact that it is marginal in character makes it more difficult to adjust to than if it were wholly and persistently driver (Sharma 1972). Due to desertic conditions the temperature of this region is extremely hot. In summer season the maximum temperature is found up to 48.5° C and in winter season the lowest temperature is found to -1.1° C. More variation is found between the day and night temperature in the summer. The summer's nights are exceptionally cool as the surface quickly radiates out the solar energy. The average annual rainfall of this region is 363 mm. The rainy days are of very short time i.e. from July to half of September. Maximum amount of rainfall depend upon the Arabian Monsoon. There is considerable variation in mean annual rainfall.

Water Resource

Main source of water for human as well as wildlife is rain water. Water from the sanctuary areas flows in the sanctuary & get accumulated in 8 different water bodies in the sanctuary. This water is sufficient only for 3-4 months up to Nov. - Dec. Water is a limiting factor in this region. Sanctuary is also having a network of artificial water supply system. An underground water storage tank of capacity more than 3 lakh litres has been constructed and it is filled with water supplied by PHED system. Five water holes of the sanctuary are connected through pipe line networks. Water is pumped from this storage tank to different water holes during scarcity days. Underground water of the area is very saline and used for obtaining of salt. In Tal Chhapar sanctuary there are no artificial water resources like electrified wells except one passing through this sanctuary. Therefore the main source of water is only rain. As we know water is an essential and life saving thing for human as well as animals. The main source of water is rains, and well is also a source with is to be developed by the humans.

Floral Diversity

Natural vegetation in this area has been classified as Northern Tropical Thorn Forest (6B) and sub-classified as Desert Thorn Forest (6B/C1) (Champion and Seth, 1968). The entire area is a typical grass land interspersed with shrubs and trees. The shrubs found in the sanctuary are

Haloxylon salicornicum (Lana) and *Capparis decidua* (Keer). The trees are *Prosopis juliflora* (Angreji bavanlio), *P. cineraria* (Khejri), *Acacia nilotica* (Desi babul), *Ziziphus nummularia* (Ber), *Salvadora persica* (Mithijal), *Azardirachta indica* (Neem), etc. The grasses are *Boerhavia diffusa* (Chinawari)*, Portulaca quadrifida* (Ram-jata)*, P. oleracea* (Luni)*, Cyperus rotundus (Mothiya), Suaeda fruticose* (Lunaki) etc.

Faunal Diversity

The Sanctuary supports a variety of faunal groups including many unique faunal elements. Black bucks (*Antelope cervicapra*) are the dominant mammalian fauna along with chinkara (*Gazella bennettii*), blue bulls (*Boselaphus tragocamelus*), Indian fox (*Vulpes bengalensis*) and desert fox (*Vulpes v. pusilla*). Jackal (*Canis aureus*) and Asiatic steppe wildcat or Desert cat (*Felis silvestris ornata)* are also spotted occasionally. Chief herpetofauna includes spiny-tailed lizards (*Uromastyx hardwickii)*, common monitor lizard (*Varanus bengalensis*) and desert monitor lizard (*Varanus griseus*). The area is one of the few areas in Rajasthan where both species foxes and monitor lizards seen together and breed, which itself is a uniqueness of this Sanctuary. The Sanctuary lies on the way of the passage of many migratory birds such as harriers. Commonly seen harriers are lager falcons, eastern imperial eagle, short-toed eagle and tawny eagle. Other birds found in the sanctuary include house sparrow, green bee eater, black ibis, demoiselle cranes, skylarks, crested lark, blue jay, partridges, king vulture, cinereous vulture and white backed vulture etc. The Tal Chhapar wildlife sanctuary is a unique protected area which bears fair population of black bucks in a small area of 719 hectare. In real sense it is a black buck sanctuary. The wild animals found in the sanctuary are black buck, Chinkara, fox, jackal, Neelgay, jungle cat, hare etc. Beside these animals there are many species, which migrate from other parts of the country during winter. Detailed accounts of the species found in the reserve are given in the following table.

Migratory Pattern of Animals

The wild animals exhibit phenomenon of local migration within the sanctuary and to neighbouring areas. The migration is mostly for water, but sometimes animals migrate for food also. During summer the wildlife migrates and confine near the water holes. The carnivores migrate outside the sanctuary area, during night. Few migratory birds also visit the area and leave it again in late February. Migration of exotic fauna is regular phenomena in the sanctuary.

Rearing Habits

The Tal Chhapar sanctuary area is almost treeless plane land. Grasses in certain scattered patches are found with very low density and height. Black buck and Chinkara both are browser and they browse shrubs like Ker, Ber, Lana, Bui and small grasses. Black buck feeds during day time but it feeds in morning and evening hours during hot summer. During summer they face tremendous water scarcity.

Population Trend of Blackbucks

The data from 2005 to 2010 census was procured and various general parameters were calculated out of it. Interestingly the overall Blackbuck population was 1680 heads in 2005-2006 which have been reached up to 2025 heads in 2011 census. The data suggests that almost every year population is increasing; where as a slight decline was noticed in year 2003,

2005 and 2007. It is estimated that percent growth of Blackbuck is about constant in two years that is 4.37 in 2008 and 2009.

Conclusion

The aim of the present study was to assess the threatened ecosystem of the Tal Chhapar Sanctuary. This study provides a vista of the sanctuary in terms of its ecological. As the area is limited, a better management by the state forest department could be an initiative to protect the biological diversity, particularly the famous Indian black bucks. As per the census survey of 2010, the current population of blackbucks is 2025 heads in nearly just 780 hectares of area. This situation leads towards a serious question as how to manage their population? In the absence of large predators there is no natural check on their increasing population. This situation can threaten the ecological balance of the sanctuary. Due to overcrowding of this species there is severe shortage of food during summer (requiring outside supply of fodder), frequent raiding of nearby agricultural fields during food shortage and mass mortality of the species in recent years as a result of weather shocks (in the form of heavy rain or cyclone). Both outside supply of fodder and raiding of agricultural fields create problems for both forest department as well as local people. The population trend of blackbuck is increasing since last one decade with more then 4-5 per cent growth rate. Whereas the sex ratio is decreased from 2.8 female/male in year 1999 to 1.29 female/male in 2010, it may alter the breeding behaviour through lacking, which was a result of high female herd side. Mother-fawn ratio is also slightly increasing from 0.33 to 0.45 since last five years, which indirectly leads towards the high population density. The Sanctuary and its management staff are fully devoted to keep blackbuck population safe and healthy, and results are also showing their efforts. But at the same time, a serious and urgent need of present time is to increase the size of sanctuary or shift few hundred blackbucks to similar nearby areas and make those areas as satellite part of this sanctuary. Attempts should be done to keep these areas connected by a corridor for populations to migrate in between. This will also reduce population pressure of blackbucks on spiny-tailed lizards, another conservation dependent species. Thus, some initiatives would be welcomed if government pays attention and will be helpful in maintaining the ecological balance of the region.

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