International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No. (02), January 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

INFLUENCE OF ANTHROPOGENIC ACTIVITIES ON BLACKBUCK POPULATION AT SORSAN REGION OF BARAN DISTRICT, RAJASTHAN

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ABSTRACT

In the last fifty Rajasthan has experienced histrionic changes in climate, resource availability, species richness, livestock populations, and human development. Human population growth and anthropogenic activities lead to habitat destruction so that an increasing percentage of land area is put to human use. The blackbuck is an important ecological and symbolic species in grasslands of India. During last four decades, blackbuck populations have recovered from sharp declines brought on by a variety of anthropogenic activities. Continual human population growth and development presently threaten blackbuck population in spite of the initiatives taken by the Indian government to protect blackbuck. Blackbuck is a prominent animal of Sorsan grasslands of Baran district, Rajasthan. Soran region, being in the command area of Right Main Canal of Chambal the region is fertile and well irrigated. The important anthropogenic activities which may limit the population of blackbuck in Sorsan grassland includes habitat encroachment for agriculture, deforestation, hunting/poaching, competition for grazing with livestock, expanding road networks, pollution and environment degradation.

Keywords: Antelope, Deforestation, Grassland, Poaching, Pollution, Population

I. INTRODUCTION

Anthropogenic activities, directly and indirectly, are now the principal cause of changes to global biodiversity. Natural catastrophes have always occurred in every region—ranging from seasonal climatic events leading to local habitat destruction to global landscape changes—but the resulting changes in biodiversity are mostly reversible. Effects of many human activities, however, are frequently irreversible, at least over the span of a human life. Habitat destruction by anthropogenic activity is mainly for the purpose of harvesting natural resources or for agriculture. Rural community economic dynamics are often closely tied to agriculture. Other important causes of habitat destruction include mining, logging, trawling and urban sprawl. Habitat destruction is currently ranked as the primary cause of species extinction worldwide [1].

Blackbuck (*Antilope cervicapra* Linn.) is a medium-sized antelope species which was distributed across India and in parts of Pakistan and Nepal [2, 3]. Due to decline in its population in different habitats, the species is now only found in India [4]. The IUCN has listed this animal as ―Least Concern [5] and is included in Appendix III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In India,

hunting and poaching of blackbuck are prohibited under Schedule I of the Wildlife (Protection) Act of 1972 [6]. The Sorsan grassland of Baran district is efficient habitat for blackbucks. The Sorsan grassland spreads between Amalsara and Sorsan village of Baran district of Rajasthan. It stretches between right main canal of the Chambal and the Parvan River [7]. The Sorsan grassland has high potential to be designated as blackbuck sanctuary due to the suitable availability of habitat which is evident due to the presence of blackbucks in high number [8]. This region like other regions worldwide is facing ill consequences of eco-transformation and anthropogenic activities [1]. Given that human-dominated landscapes are increasing it is becoming increasingly important to understand how humans and other species are able to coexist in these landscapes and to devise strategies that mitigate conflict and support coexistence with other species [9-12].

II. STUDY AREA:

Sorsan grassland is 35 square kilometers patch distributed between Amalsara and Sorsan village of Anta tehsil in Baran district of Rajasthan. After reports of presence of Great Indian Bustard (Godawan), a near-extinct species and the state bird of Rajasthan, state government in 1984 has banned poaching or hunting of animals in sorsan region under wild life act 1972. It is known for ideal habitat for blackbuck and other wild life. It is 50 km east of Kota (25.00 -25.8^0 N, 76.12- 76.18^0 E) having scrubby vegetation and numerous small water bodies, which harbour amazing varieties of birds as well as animals.

Sorsan region is very eco-diverse area; it has several structurally and functionally identifiable ecosystems, such as different types of forests, grasslands, pastures, river catchments, ponds and swamps. It has around 2000 blackbucks (*Antelope cervicapra*) and 250 chinkara (*Gazella bennettii*). Besides the blackbuck various mammalian species are found in sorsan region including wolf (*Canis lupus*), Indian gerbil (*Tatera indica*), Jackal (*Canis aurius*) and small Indian civet (*Vivericula indica*). Some other species of mammal present are namely Hare (*Lepus nigricolis*), Squirrel (*Funambulus palmarum*) and species of rodents. During monsoon season insects are very abundant in Sorsan region, which attracts many birds, including blue cheeked bee-eater, white-eared bulbul, orioles, quails, partridges, robins, shikra, white throated kingfisher, weavers, greater coucal, little egret and waterfowl such as bar-headed and greylag geese, common pochards, teals, common moorhen and pintails. Flocks of immigrants, such as warblers, flycatchers, larks, starlings and rosy pastors can be seen during winter season.

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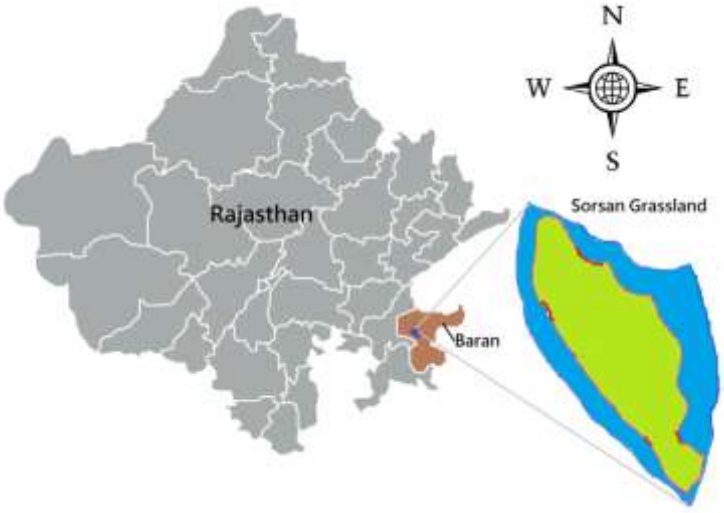

Figure 1: Location map of Sorsan grassland, Baran District, Rajasthan.

III. MATERIAL AND METHODS:

During the present investigation, direct visual observations around selected sites were followed to collect preliminary information on the trends of the blackbuck population and anthropogenic activities which can shrink their population. Direct visual observations on animals were made directly in the habitat the study period during the duration of December 2016 to December 2017. Methodical temporal observations were made during morning, afternoon and evening. The observations were made for 4 days in a week in different selected habitats. For direct observations suitable locations were determined in study area and approached with the least disturbance to the animals. Most of the direct observations were made from elevated platforms or watch towers (made by Forest department for tourists) in important places near feeding ground, pastures, waterholes like stream beds / ponds for blackbuck population assessment. A field binoculars and mobile based GPS were used throughout the study for observation of the study animal in the field. Photographs of blackbucks were taken using high resolution camera.

IV. RESULTS AND DISCUSSION:

Population status and structure: Black buck exhibit clear sexual dimorphism. Males are easily distinguished by their large spiraling horns, which can reach 70-80 cm long (Figure 2a). Females and juveniles are yellowish on their back and head (Figure 2b), and are generally have small or no horns [13]. Both sexes have white under parts, including the insides of the legs and lower chest, as well as a white ring surrounding the eye and a white chin [14]. The blackbuck population assessed during present investigation in Sorsan grassland is 2070 individuals. Maximum individual were observed around Sorsan pond, Niyana anicut and Amalsara village. Social organization mainly included territorial herd (one male and many females) but all female herd, bachelor herd (all male) and mixed herd were also sighted. The group size ranged from as low as four individual to as high as hundred individuals (Figure 2c and 2d).

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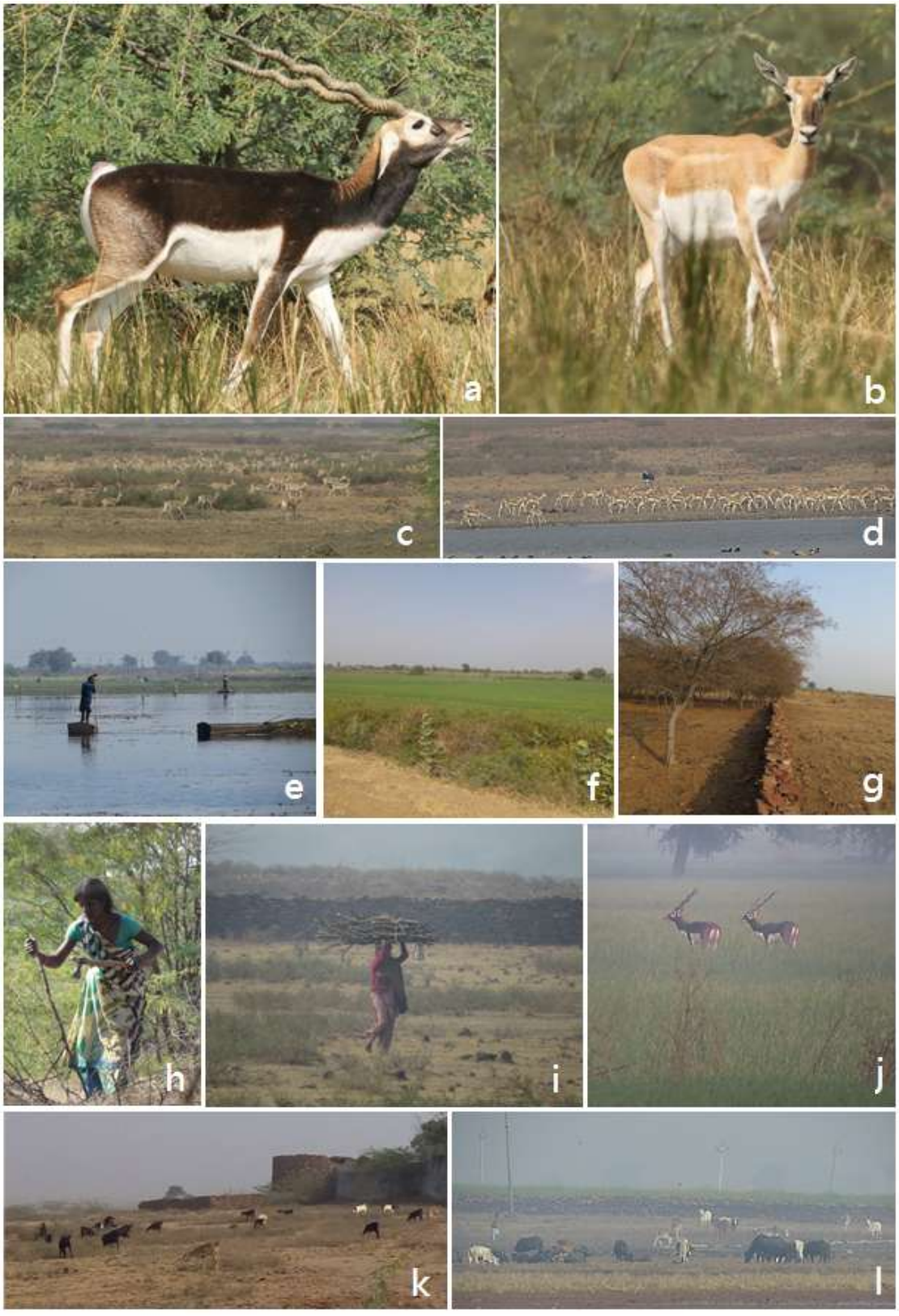

Figure 2 a. Adult male blackbuck, b: Adult female blackbuck, c & d: Large herds of blackbuck in Sorsan region, e, f & g: Habitat encroachment for agriculture, h and i: collection of fuel wood from Sorsan forest, j: Crop-raiding by blackbuck, k and l: Grazing by livestock in blackbuck habitat

Habitat encroachment for agriculture use: Habitat encroachment has been the biggest threat to biodiversity. The inhabitants and species are expected to suffer when their habitat becomes degraded or is lost completely. Sorsan habitat is the open grasslands and is continuously being encroached upon and slowly converted into agricultural land (Figure 2e, 2f and 2g). Sorsan grassland has very fertile land and this area is surrounded by several villages [1]. There has been a tremendous increase in agricultural activities in earlier uncultivated land of this region and human habitations have spread far and wide. As their habitat is shrinking due to agricultural activities, blackbuck population in Sorsan grassland is being restricted to small patches [1].

Deforestation: The forests play an important role in maintaining the quality of local and global environment besides their significant contribution to local and national economy. Deforestation is a major cause of habitat destruction and environmental degradation. Tropical countries like India with huge population pressure and widespread low income groups are main frontier of deforestation. Most of the low-income group families of the nearby village depend on scrubland/grassland to collect fuel wood (Figure 2h and 2i), fodder for their livestock. Exploitation of important resources is a threat to the quality of the habitat used by blackbucks.

Human-Blackbuck conflict: Crop-raiding by locally overabundant populations of blackbuck has been widely reported in many parts of the country. Similar events of occasional crop-raiding by blackbuck have been reported by farmers in Sorsan region (Figure 2j). Farmers of low-income group cannot afford this loss to their crops raided by blackbuck. Most of the farmers remain vigilant during crop season for safeguarding their fields against blackbucks. Realizing the seriousness of the problem, many farmers in Sorsan region are now becoming gradually intolerant to damage to their crops [1]. Some have developed direct aggressive attitudes toward the blackbuck. This is serious issue and has to be addressed by suitable authorities, such that this region can see continuous co-existence of blackbuck with humans.

Sympatry with livestock: Local people in Sorsan region have a very high number of livestock populations including sheep, goat, cow and buffalo. The milk, wool and meat obtained from these pet animals are major source of earning for these low-income group populations. The domesticated animals are fully dependent on grasslands and scrub forest which is major blackbuck foraging area (Figure 2k and 2l). Livestock maintained by farmers and local inhabitants are giving tough completion for grazing to blackbucks in Sorsan region [1].

Hunting and poaching: Humans have long hunted wild game from forests, but over the past 50 years commercialization of killing has triggered a rapid increase in wildlife depletion. The blackbuck population has decreased throughout the country due to extensive poaching during early twentieth century [1]. Poaching has usually been defined as the illegal hunting or capturing of wild animals, frequently associated with land use rights [11]. The detrimental effects of poaching include defaunation of forests, reduction of animal populations in the wild and possible extinction, the reduction in effective size and wildlife tourism destinations face a negative publicity.

Pollution: Pollution is the major anthropogenic activity influencing various types of life existing in the eco-systems through several aspects. Wildlife and pollution are inter-linked aspects; the climatic changes in the environment play a crucial role in the extinction of various threatened species [10]. The increase in pollution level around Sorsan region due to various human activities like the burning of residual crop waste, use of coal and wood as fuel, increase transportation – are serious threats to complete wildlife inhabited to Sorsan grassland. Whether the effect of pollution is long-term or immediate, the result is the same: pollution alters the fragile balance of ecosystems and brings death to many animal populations [12].

V. CONCLUSION:

Wildlife resources establish a crucial link in the survival of the human species and have been a subject of much research, fascination and interest all over the world. Wildlife habitat and species around the world are under severe pressure due to various anthropogenic activities and a large number of species of wild fauna have become endangered, the effective conservation of wild animals is of great significance. The future depends on the interaction between captive and wild animals, preservation of biodiversity, and genetic and demographic variations of species. Due to threat observed in the Sorsan areas by various anthropogenic activities, forest department and local community must develop a model for habitat conservation by way of ecosystem development for continued existence of blackbuck in this region.

VI. ACKNOWLEDGEMENT

Authors are thankful to Dr. Krishendra Singh Nama for the assistance in the field photography. The corresponding author is also grateful to Council of Scientific and Industrial Research (CSIR), New Delhi, India for providing financial support in form CSIR-UGC Junior Research Fellow for the present research.

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