

Threats, Conservation problems of *Chinkara* (*Gazella bennettii*, Sykes, 1831) in Barmer district, Rajasthan

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Abstract

Chinkara populations facing many threats like- expansion of agricultural land and urbanization, predation by feral dogs, illegal hunting and poaching for its flesh, skins and horns, habitat destruction due to large scale industrialization and petrochemical activities, overgrazing causing depletions of *Chinkara* survival and populations in Barmer district. Electrical shock and iron wire fencing around croplands also responsible for deaths and injuries of *Chinkara* in many areas. Invasion of *Prosopis juliflora* and excessive cattle grazing responsible for declining of food availability and food scarcity in study areas. Strong need of chinkara conservation, awareness program in local peoples and community needed for better survival chances of this species. Creation of local and region corridor in roads, highways, another cause of chinkara mortality is water canals in Barmer region, they use to for drinking water and slip into canal and drown and can't escape due to steep angle of canal. Excavation of artificial water bodies and holes for availability of drinking water throughout year especially in summer season. Genetic and molecular studies may be beneficial for assessing genetic variation among population at different places.

The Thar Desert or Great Indian Desert is tenth largest desert of world and almost cover 2, 78,380 square km of western part of India. *Chinkara*, an antelope generally found in Indian subcontinent region and now facing population declinations in all habitats including the Thar Desert (Prakash, 1988). Due to illegal and enormous poaching and degradation of natural habitats, the populations are day by day declining. Presently Chinkara

populations have high abundance in protected areas as compare to unprotected area. An adult male height can reach up to 65 centimeter and weight almost 23 kg and the average length of horn grows up to (25-30cm). Male have longer horn size as compare to female. Females are smaller and lighter in weight as compare to adult male and sexual dimorphism is well marked and can be easily marked⁸. The genus *Gazella* contains fourteen species

throughout the world⁹. Whereas *Chinkara* is a single species mostly found in drier part of western Rajasthan to eastern part of Bihar, Punjab- Haryana in northern side and up to Krishna River of south India. *Chinkara* is widely distributed in all part of Rajasthan state but relatively higher abundance in Thar Desert and dry areas as compare to other parts of state¹⁰. Almost 85 percentages of chinkara population sustained in Southern Western part of Rajasthan and minimum distributed in this area^{5,9}. *Chinkara* generally preferred wide variety of habitat. They use to feed upon *Acacia* plants leaves and pods in the Thar Desert¹. Generally, *Chinkara* lives in small groups or herds of 10 to 20 in numbers or less, their herd size depends upon abundance and density in particular habitat. They usually reside in wide variety of habitat like thin forests, barren lands, rocky & scrubland these are commonly sighted in Thar Desert. It is very shy animal and generally avoids human dominated habitat and colonies. They have very good sighting and hearing capacity. *Chinkara* to be considered sacred and protected animal by the Bishnoi community in western Rajasthan and maximum population sustained around villages of Bishnoi communities^{2,3,6}. *Chinkara* is listed in IUCN red data book and categorized into schedule I animal species according to Wildlife protection act, 1972 and provided legal protection for its conservation and prohibited of poaching an illegal hunting throughout India.

Objective of study :

Objective of present studies was analyzed various threats, conservation

problems of *Chinkara* survival in the Thar Desert in various region of Barmer district. Study also gave details account of conservation remedies for *Chinkara* survival and saving from imideate extinction from local and region levels.

Study area :

Barmer district located in the western part of the Rajasthan 24°58' and 26°32' N and 70°05' and 72°52' E. Total area of district is 28,387sq km. It is surrounded and share borders with Jaislmer in north, Jodhpur and Pali in east, Jalore in the South and Pakistan in the west. District has extreme desert conditions, where annual precipitations ranges between 20-25 cm and temperature rises up to 50°C in summer and in winter drop down below freezing point. District contains large proportion of human population in rural areas as compare to urban. District have almost 2500 small and large village.

Study was carried out from Jan. 2017 to Dec. 2020 of different villages, towns, tehsil, sacred grooved forest generally called orans or goucher land and various protected area of Barmer district. Data were collected by regular observation, focal animal sampling and interaction with local peoples of various communities and with the help of various news agency of district. Photography of various habitat and Chinkara was done by with the help of Nikon P900 and P1000 cameras.

Study carried out in different habitat and aspects of Chinkara in many villages, towns and teshis of Barmer district for analyzing various threats and conservation problems for its survival. Main factors, threat

and conservation problems were :

(I) Conversion of desert or uncultivated land into cropland : Due to Indira Gandhi Nahar Pariyojna (IGNP), which rapidly changed barren and desert into agricultural land because availability of water and irrigation facility throughout year. IGNP canal system also responsible for habitat modification and desert biodiversity composition including flora and fauna. Canal system also a major cause of *Chinkara* death because once they fall into canal couldn't escape. Some time open water bodies' pond called "taka" in regional language also responsible for death of *Chinkara*. Global warming is also responsible for changes in climatic conditions of desert area due to excessive environmental temperatures, non seasonal and more rainfall patterns becoming limiting factors for biodiversity depletions in desert.

(II) Conversion of desert into industrial and refineries of coal and oil: Refinery and petrochemical industries established rapidly and expanding in Barmer district and other Thar Desert areas. Expansion of various petrochemical industries influenced desert ecosystem and endemic biodiversity, due to expansion of refineries and petrochemical industries open land and desert grassland ecosystems are continuously reducing. Non-protected fragmented small patches expanding due to excessive growth of human populations and establishment of factories, various industries, mining and other commercial activities.

(III) Overgrazing : Barmer district farmers and other communities contain large

amount domestic animals like – cow, sheep, goat, camels and buffaloes, their income depends upon seasonal agricultural activities, due to high livestock population, overgrazing and uncontrolled utilization of food materials causes high risk of food scarcity and reduce resource and habitat availability for *Chinkara* especially in summer seasons. Uncontrolled and frequent overgrazing and collection of timber also responsible for reduction in food density in small protected community reserve areas like- Orans, and grouchier lands.

(IV) Wildlife-vehicle collisions: The development of roads, highway and railway lines also responsible for road killing of wildlife and specially *Chinkara* deaths in Barmer district. Day by day *Chinkara* road accident incidence increases and become major factor of population decline in various areas of district.

(V) Invasion of Exotic species: Invasion of *Prosopis juliflora* and *Parthenium hysterophorous* create less suitable habitat for *Chinkara* due to reduce production of grasses and native desert plant species. Some drought affected areas are highly affected by invasion of *Prosopis juliflora* and day by day create less suitable habitat for *Chinkara* in district.

(VI) Food and water scarcity: Overgrazing and spreading of exotic species create food availability of *Chinkara* in district becoming limiting for its survival and growth. In desert areas due to scarcity of water throughout year and due to low annual precipitation also responsible for decline wildlife survival and *Chinkara*.

(VII) Hunting and poaching: Illegal

hunting and poaching by tribal and royal community, hotels owner for *Chinkara* horn, skin, flash or meat. They are also responsible for dramatic delineation of *Chinkara* population in Barmer district and other areas.

(VIII) Electrocutation in agricultural iron fencing: Iron net fencing around agricultural and private lands; *Chinkara* injured when they run from natural predators and attacked by feral dogs. Spiny and pointed iron fencing damage various body parts of *Chinkara* and sometime larger damage results excessive bleeding and wound leads to death due to sickness and infections. Some farmer spread electric current in iron fencing to protect crop damaged by domestic and wild animal also responsible for death.

(IX) Abundance of feral dogs: feral dogs populations are rapidly increase due to higher reproductive rate in all over countries. Overabundant population of feral dogs becoming major threats of wildlife survival specially herbivores and ungulates species. This was observed in Barmer district on *Chinkara* populations and its survival. Various aspects of *Chinkara* have been shown in figures 1-15.



Figure 1- Overview of *Chinkara* habitat *Acacia* dominated habitat in summer season



Figure 2- Overview of *Chinkara* habitat *Acacia* dominated habitat in moonson season

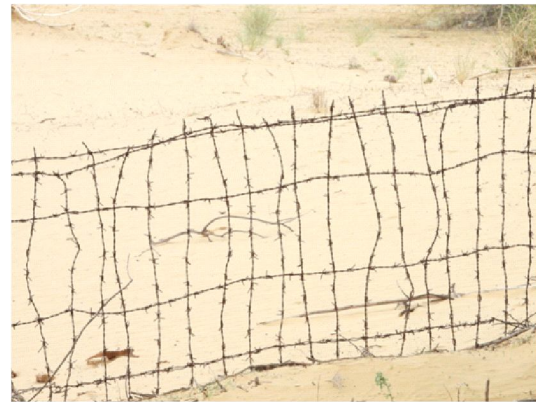


Figure 3 – Iron net fencing around agricultural land near *Chinkara* habitat



Figure 4- Road passing between forest habitats



Figure 5- Dry, old and open water bodies hole (Taka)



Figure 8- Injured *Chinkara* to fall in Iron fencing around agricultural land



Figure 6- Feral dog movement around *Chinkara* abundant habitat



Figure 9- *Chinkara* and network of Iron fencing



Figure 7- Overview of desert ecosystem in summer season



Figure 10- Overgrazing by cattle's and reducing food availability for *Chinkara*



Figure 11- Crossing of road by *Chinkara*



Figure 12- Newly born Fawn after attacking of feral dogs



Figure 13 - Setup of Electric shock machine around agricultural land become fatal to *Chinkara* survival



Figure 15- Injured *Chinkara* due to feral dog attacks and rescued by local peoples

Conservation remedies for saving from earlier extinctions :

Suggestions made for conservation of *Chinkara* in Thar Desert. (i) Sign board speed limitation must be mandatory in chinkara dominated habitats and strong penalty should impose on defaulters. (ii) Time to time conservation programs, campaign, wildlife friend club should run on different levels of communities for saving *Chinkara* (iii) Organized and large level of eradication program for eradication of *Prosopis juliflora* in Thar Desert. (iv) Organized large levels of plantation programs in Thar Desert with the help of local peoples and various NGOs and forest department. Specially planted native plant species like *Prosopis cineraria*, *Tecomella undulate*, *Capparis decidua* and

other grasses, it will provide food for wild animals throughout year. (v) Radio caller tracking and habitat management will be helpful for Chinkara conservation and threats. (vi) Reduce physical barrier and create local and regional corridor on water canals and highways to decrease road kill. (vii) Artificial small water bodies to provide water throughout year especially in summer. (viii) Proper management and control on feral dog population is necessary to conserve Chinkara and other wildlife. (ix) Genetic and molecular study are also needed for determining genetic variations, gene pool and regional migration of Chinkara. (x) Establishment of wildlife rescue and rehabilitations center at every tehsil level.

Chinkara facing various types threats including natural disasters and anthropogenic induces factors in Barmer district. These factors like– expansion and spreading urbanization, industrialization, habitat fragmentation and modification, invasion of exotic species, overgrazing leads to unfavorable environment for its survival. Efficient conservation management and scientific study needed for saving threatened life and its survival in Thar Desert areas.

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