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Kachchh Biosphere Reserve: Rann and Biodiversity

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Abstract: Rann is largest saline and marshy tracts in the entire world usually have low rain fall and sparse vegetation. However, it forms its own unique ecosystem which supports unique biodiversity of flora and fauna. Similarly, Kachchh Biosphere Reserve (KBR) is mainly composed of two major ecosystems called Great Rann of Kachchh (GRK) and Little Rann of Kachchh (LRK) covering area of 12,454 km^2, the reserve mainly it covers Kachchh Desert Sanctuary (in GRK) and Wild Ass Sanctuary (in LRK). A reserve also covers part of finest grassland of Asia called "Banni". No many researches are available about the scientific information of KBR.

Key words: Rann, biodiversity, biosphere, kachchh

INTRODUCTION

Great Rann of Kachchh (GRK) and Little Rann of Kachchh (LRK) is one of the largest saline and marshy tracts of the world (Vijaykumar *et al*., 2007). Rann of Kachchh is characterized by the low rain fall and sparse vegetation. However, this region has a special and different demography from the rest of the desert because of its location near the sea and low-lying areas by which marine water enters into the vast expanse. As a result, Rann of Kachchh is an admixture of saline, marshy and coastal desert where water and soils are extremely saline. This characteristic makes Rann as a special for biodiversity point of view because it harbors its own, unique forms of desert flora and fauna, with some endemic and species of high conservation significance both at national and international levels.

With understanding of the immense value of the Rann ecosystem, Kachchh Biosphere Reserve (KBR) has been designated as the 15th Biosphere Reserve of India on January 29, 2008. The KBR lies between 22°55' N latitudes and 69°05' E to 71°50' E longitudes and spread over area of 12,454 km^2 covering parts of four districts namely Kachchh, Rajkot, Surendranagar and Patan districts of Gujarat state, India. The reserve is mainly composed of two major land units known as Great Rann of Kachchh (GRK) and Little Rann of Kachchh (LRK). The GRK and the LRK with an area of about 16780 and 5180 km^2, respectively, constitute the entire Rann of Kachchh. However, entire area of GRK and LRK is not a part of KBR. Initially LRK was identified as one of the potential site for bio-sphere by Core Advisory Group of Experts but considering a whole Rann as unique and import ecosystem, reserve was expanded to include GRK. Out of total area of KBR, Kahchh Desert-wildlife Sanctuary (KDS) covers area of 7500 km^2 of GRK and Wild Ass Sanctuary (WAS) covers about area of 4954 km^2 of LRK. Out of the entire area, 4455 km^2 forms the core zone and 7999 km^2 of buffer zone of the KBR. Out of total area of core zone, KDS comprises the area of 3500 km^2 and WAS 955 km^2.

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The Rann areas of KBR in general characterized by a flat topography, annual water inundation pattern, high salinity, barrenness and many small uplands locally called bets. The bets are slightly raised isolated patches of land with less salinity and support some xerophytic vegetation. Ecologically, GRK and LRK represent one of the largest seasonal wetland areas with water depth ranges from 0.5 to 1.5 m. However, after October-November, water start drying up and the area turns into a saline desert by forming thick layer deposition of salt crystals (GEER, 1999; Meena *et al*., 2008; GUIDE, 2002; Joshi and Sunderraj, 2009).

GREAT RANN OF KACHCHH (GRK)

Salt-impregnated GRK is one of the most remarkable and unique region in the entire world due to its wilderness value and appears like a tabletop surface, interspersed with small uplands (islands) locally called beyts or Dhoi with green vegetation. There is no prominent landmark except many beyts. Study conducted by a State Government Department, Gujarat Ecology Commission (Babbar *et al*., 1994) identified 13 islands in GRK, out of these Khadir, Pachchham, Tragadi, Sol, Kakida and Sansla are well known islands/beyts. Khadir, Pachchham, Tragadi and Sansla are also called as hilly islands of Rann (Ali, 1945). These islands/bayts supports many important species of flora and fauna.

Biodiversity

In GRK, Pachchham is largest island of the Kachchh district and due to diverse habitats it supports many plant species (Joshi, 2002). In 2002, being a high floral diversity area, it was suggested that it should be declared as an Ecologically Sensitive Area (ESA) (Joshi, 2002). Similarly, Khadir is also one of the largest island of GRK which supports diverse vegetation types including mixed scrub thorn and savanna (Joshi and Sunderraj, 2009). Rare and Endangered plants species of GRK includes *Citullus colocynthis*, *Commiphora wightii*, *Convolvulus stoksii*, *Dactyliandra welwitschii*, *Dipcadi erythraeum*, *Ephedra foliata*, *Helichrysum cutchicum*, *Heliotropium bacciferum*, *Heliotropium rariflorum*, *Ipomoea kotschyana*, *Indigofera caerulea*, *Limonium stocksii*, *Pavonia certatocarpa*, *Sida tiagi* and *Trilumbs rajasthanisis*. In the eastern border of Banni grassland, inside the GRK a place locally known as Shrawan Kavadia, there is a land-locked patch of Mangrove (*Avicinnia marina)* forest of about 2 ha surviving without any direct connection with sea water. This patch is mainly surviving due to micro-environmental conditions created by saline Rann and Banni grassland. The GRK also well known for established nesting and breeding ground of Greater Flamingo in India. Many migratory birds attracted towards this region because of food (algae) availability in the saline-desert-marshy ecosystem. For example, Hunj Bet (Hunj is the local language name of Flamingo), right in the centre of the GRK, is popularly known as Flamingo City, is famous breeding grounds of the Greater Flamingo (*Phoenicopterus rubber*) in India had been first reported and discovered in the 1886 by Maharao Khengarji (Patel, 1971), but it was Dr. Salim Ali's work that forms the first major account of this amazing phenomenon. The area is famous for the largest congregation of Greater Flamingo in the entire sub continent where about 100-200 thousand birds lay the eggs. The area after the rainfall is converted as a marshy island, where the Greater Flamingo visits in tens of thousands in number for breeding. In 1945, Dr. Salim Ali estimated a population of half million birds from the site. Small mounds of muds make the nests on the ground and on each mounds the birds lay their eggs. According to last estimates, there may be about 100,000 birds visited the (Meena *et al*., 2008). The area may not be considered very rich in diversity, but it supports one of the magnificent ecological phenomena, which need to be preserved.

Besides Greater Flamingo, Lesser Flamingo (*P. minor*) and Avocet are also recorded having bred in GRK in the past (Singh, 2001). Further more this area supports many water birds. Among mammalian species, Long-eared Hedgehog (*Hemiechinus auritus)*, Indian wolf (*Canis lupus pallipses*), desert fox (*Vulpes vulpes pusilla*), Chinkara (*Gazelle gazelle*), desert cat (*Felis silvestris*), India porcupine (*Hystrix indica*), Indian ratle (*Mellivora capensis)*), caracal (*Felis caracal*) and striped hyena (*Hyena hyena*) have been recorded from different areas of GRK. Moreover, GRK provides shelter to Indian wild ass (*Equus hemionus khur*), a threatened sub species of Asiatic wild ass. A small fish species *Cyrinodon dispar* is common in Rann. Similarly reptile species like saw-scaled viper (*Echis carnatus*), common India krait (*Bungarus caeruleus*), black cobra (*Naja oxina*) and several species of lizards like spiny tailed lizard (*Uromastix hardwickii*), desert monitor (*Varanus griseus*) are also recorded from GRK. A Gecko species, Banded gecko (*Crytopodion kachhensis*) found in GRK is an endemic to the Kachchh region of the India.

LITTLE RANN OF KACHCHH (LRK)

The LRK is Southward extension of GRK usually described as a flat, saline waste or salt-impregnated wilderness. The LRK is similar to GRK in physiography, edaphaic conditions, eco-climate and vegetation. It lies to the Southeast of the Great Rann and along a line of marine recession between the Indus Delta and the Gulf of Khambhat. During the southwest monsoon (July to September), large areas are inundated by up to 2 m of water, much of which is pushed up from the Gulf of Kachchh by strong westerly winds. The salt flats dry out almost entirely during the prolonged dry season. Saline areas are relieved by areas of slightly higher ground with salt-free soil supporting stunted, scrubby vegetation. Total 74 beyts have been identified out of which 51 having vegetation cover (Meena *et al*., 2005).

Biodiversity

Totally 253 flowering plants species have been enlisted from the LRK region of reserve (Meena *et al*., 2005). However, due to maximum similarity with GRK, many threatened plant species found in GRK also occur in LRK. A total 93 species of invertebrates includes 25 species of zooplanktons, one species of Annelid, 4 crustacean, 24 insects, 12 molluscans, 27 spiders have been recorded from Nanda and Shedwa bayets. The LRK also supports brackish water fisheries, especially the prawn fisheries. Mixing of tidal water from the Gulf of Kachchh with the fresh water discharged from the rivers takes place in LRK, making important nursery ground for prawns. Eleven prawn species have been recorded with major contribution of *Metapenacus kutchensis* (endemic to Kachchh) and *M. affinis*.

Among vertebrate fauna Wild Ass Sanctuary in LRK provides breeding and roosting habitat for large number of diverse avifauna. A variety of resident and migratory birds belonging to at least 178 species occur in the Wild Ass Sanctuary of LRK (Singh, 2001). About 81 terrestrial (9 migratory extra-limital) and 97 water birds (42 migratory) have been recorded from different 16 sites of the wild ass sanctuary in LRK. However, during 2004 survey conducted by Corbett Foundation, 186 bird species were recorded from this area. Rare and endangered bird species found in the LRK includes Hobara Bustered (*Chlamydotis undulate)*, Lesser Flamingo (*Phoenicopterus minor)*. In 1998, a large breeding colony of Lesser Flemingo was observed in the LRK. Further more, a threatened waterfowl all over the world, has been regularly seen in the Wild Ass Sanctuary of LRK. So, this sanctuary is recognized as wetland site of international importance. Among herpetofaunal species, four

species of amphibians, two species of turtles, 14 species of lizards, 12 snakes and one crocodile have been recorded from this region. Herpetofaunal species like Indian flapshell turtle (*Lissemys punctata*), spiny tailed lizars (*Uromastyx hardwickii*), saw-scaled viper (*Echis carrinatus*), cobra (*Naja naja*) are very common in LRK. Total 33 species of mammlas have been enlisted from Wild Ass Sanctuary of LRK which includes 5 ungulates, 14 Carnivores, 1 Logomorph, 6 Redentia and Chiroptera, 1 Pholidota, 3 Insectivore and 1 species of Primate. Vast flat saline desert of LRK having unique and fascinating wildlife in general and Indian Wildlife Ass (*Equus hemionus khur*) in perticular. The LRK is quite rich in biodiversity and is famous for the last remaining population of Wild Ass (*Equus hemionus khur*) (Meena *et al*., 2008), the only gene pool in the world and one of the six geographical varieties or sub-species surviving on the earth. The Indian Wild Ass is included is listed as endangered species in IUCN's Red Data Book and also included in Schedule-I of Indian Wildlife Protection Act. According to census carried out in the months of November 2008 to February 2009, the total population of Wild Ass is about 4038. Other than the Wild Ass, the LRK also provide ideal habitat for large number of bird species (GEER, 1997, 1999; GUIDE, 2002).

Gujarat State Forest Department (GSFD) and many research organizations like Gujarat Ecology Commission (GEC), Gujarat Ecological Education and Research Foundation (GEER), Gujarat Institute of Desert Ecology (GUIDE) have contributed valuable studies in the many ecological aspects of Rann areas of Kachchh. However, looking towards uniqueness of KBR, further journeying towards various research aspects is needed to understand the ecological importance of the KBR.

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