# A STUDY ON THE DISTRIBUTION, DEMOGRAPHY AND CONSERVATION STATUS OF SARUS CRANE (*GRUS ANTIGONE*) IN ETAWAH DISTRICT, UTTAR PRADESH, INDIA

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## Abstract

An ecological survey of Sarus Crane (*Grus antigone*) was carried out for a period of two years in Etawah District, Uttar Pradesh to determine their distribution, demography and conservation status. A total of 136 adults and 17 juveniles were counted during the first survey and 144 adults and 12 juveniles were counted during the second survey. Most of them were found to occupy areas with large natural wetlands and adjoining crop fields. Breeding pairs and juveniles contributed a fraction of the population. Several factors affecting the breeding and distribution of the cranes and their implication on the conservation of the species are also discussed.

## Keywords

*Conservation status, demography, distribution, Etawah,* Grus antigone*, Sarus Crane*

## Introduction

The Sarus Crane (*Grus antigone*) is the largest of the Indian Cranes. In India, it is distributed in the states of Uttar Pradesh, Gujarat, Rajasthan, Haryana, Madhya Pradesh and Maharashtra (Archibald & Meine 1996). Anecdotal report on the distribution of the species in Jammu & Kashmir and Himachal Pradesh also is available (Gole, 1996). As far as its population is concerned, maximum numbers are in Uttar Pradesh, followed by Gujarat and Rajasthan. In Uttar Pradesh, they are located mainly in the districts of Mainpuri , Etawah, Etah and Aligarh (Sundar *et al*., 2000). Most of the research on Sarus Crane has been concentrated on aspects of breeding in select localities (Ramachandran & Vijayan, 1994; Vyas 1999). Only a few scientific studies have been conducted on this species in Etawah District (Sundar, 2000; Sundar *et al.*, 2000; Verma, 2001) and hence authentic published works are also rare. Despite the tireless efforts by conservationists and the recent move by the state government to declare Saman Bird Sanctuary in Mainpuri as the first Sarus Sanctuary in India, there is an alarming crash in the population of this species in Uttar Pradesh. Of the many factors that actively continue to operate, the loss of natural habitat seems to be the most important reason for this drastic reduction in number.

Two separate World Bank funded projects, one by Uttar Pradesh Land Improvement Corporation to drain 1,800ha of wetland for agriculture and the other by the National Highway Authority of India proposed for strengthening and four-laning the existing Etawah by-pass on N.H.-2 pose threats to the survival of this sensitive species.

Our study presents information regarding the present distribution, population characteristics and conservation status of Sarus Cranes based on two separate surveys carried out from July 2000 to June 2002 in Etawah District where they are reported to breed at rates higher than anywhere else in the world (Verma, 2001).

## Materials and Methods

Two separate surveys were carried in the natural wetlands and crop fields of Etawah District during 2000-2001 (July-April) and 2001-2002 (May-June). The months were selected so as to observe the juveniles at least during four breeding peaks. To determine the abundance and distribution 'line transect' method involving 'road transect' and 'rail transect' was employed. In case of large wetlands, which were not accessible by roads, observations and counting were done from the possible closer points using 8x40 binoculars. In both the surveys two larger perennial wetlands of the District (Nawar & Bhartana) were included.

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The encounter rate was calculated by the simple relationship,

$$\text{Encounter rate} = \frac{\text{Number of cranes counted (abundance)}}{\text{Total length of transect (in km)}}$$

Other demographic parameters studied include percentage of breeding and non-breeding pairs, juvenile-adult ratio etc. Chicks, juveniles and sub-adults as defined by Ali & Ripley (1980) were together treated as juveniles since, if treated separately, the sample size would be low.

## Results and Discussion

A total of 136 adults and 17 juveniles were recorded during the first survey and 144 adults and 12 juveniles were recorded during the second survey. Of these, 42 adults and eight juveniles were observed during the first survey and 34 adults and five juveniles during the second survey in the two natural wetlands - Nawar and Bhartana. The population composed of congregation (more than 20 individuals), groups (5 to 20), non-breeding pairs and breeding pairs (pairs with eggs, chicks or juveniles). Congregations were found only in perennial wetlands, while pairs and groups were found to occupy crop fields and even small ditches along road sides. The edges of natural wetlands and crop fields were the preferred feeding grounds. The district has an encounter rate of more than one Sarus Crane per kilometer. The details of the study are given in Table 1.

***Table 1. Abundance and demographic characteristics of Sarus Crane population in Etawah District, Uttar Pradesh.***

| | 2000-2001 | 2001-2002 |
|---|---|---|
| Kilometers travelled | 131 | 146 |
| Number of adults | 136 | 144 |
| Congregation | 2 (21, 24) | 3 (27, 22, 21) |
| Groups | 4 (12, 7, 7, 9) | 3 (9, 6, 7) |
| Non-breeding pairs | 15 | 17 |
| Breeding pairs | 13 | 9 |
| Juveniles | 17 | 12 |
| Family with two chicks | 4 | 3 |
| Encounter rate | 1.03 | 0.98 |
| Percent of non breeding population | 22.0 | 23.6 |
| Percent of breeding population | 19.1 | 12.5 |
| Juvenile-adult ratio | 0.12 | 0.08 |
| Percent of family with two chicks | 30.7 | 33.3 |

Breeding population contributed about 19.1% in first survey and 12.5% in the second survey. Breeding pairs with two chicks represented 30.7% and 33.3% respectively in the two surveys. Most of the pairs with two chicks were found during winter. Pairs were found to breed successfully in areas with natural wetlands which are also rich in food sources. Juvenile-adult ratio also showed slight variation between the two surveys. The ratio during the first survey was 0.12 and during the second survey 0.08. During the period of second survey most of the females cranes laid only a single egg. Scarcity of water and food due to scanty rain during the period could possibly be the reason for the change in breeding behaviour. A study by Vyas (1999a) in Rajasthan and some districts of Madhya Pradesh showed the percentage of breeding population as 27 and juvenile-adult ratio as 0.19. Similarly, an all-India study by Sundar *et al*. (2000) put these figures as 19.76 and 0.10, respectively. Chicks showed a survival rate of 90% when the difference in hatching between the two chicks was less than 24 hours. The attention of parents often went to the first chick, as a result of which the second one was not taken proper care of. Ramachandran and Vijayan (1994) recorded a survival rate of 86% in fledglings in Bharatpur.

We observed comparatively a very low mortality rate in Sarus. Parasharya *et al*. (1989) reported that their habit of crossing roads could possibly result in the death of individuals. Sundar *et al*. (2000) reported a 2% death rate due to collision with high tension power lines. We observed no such cases of mortality during the present study. During the entire study a single adult Sarus and two chick deaths were noted due to physical trauma and stray dog predation upon chicks.

The Sarus population in the district shows a sharp decline. The only main reason for this reduction is attributed to loss of habitat. The Sarus entirely depend on wetlands for nesting. Wetlands or crop fields surrounding the nest provide protection to eggs and chicks. They are also used for the early learning activities. During the study period, nests were not found in areas where wetlands were not present. Similarly, the low preference of Sarus to dry fields and its local movement to the water-logged areas during the summer, points the importance of wetlands in its life. Chicks are found to escape precociously from trespassers when they are hatched in or near natural wetlands. The two World Bank funded projects will definitely exterminate this species soon from the district as a result of direct alteration of their habitats. Though the draining process is temporarily on stay, the second project has its profound impact on Sarus population. The wetlands on either side of the 14km by-pass hosted about four breeding pairs and about 22 non-breeding Sarus before the commencement of the project in 2000. Since the commencement of the road project, no nests or chicks were found in the locality and the number of non-breeding

Sarus was found reduced to 19 in 2002. This suggests that human disturbance can severely affect the breeding behaviour of Sarus. If conservation measures are not taken through proper management and in-depth research, these beautiful and majestic cranes will definitely become locally extinct in the near future.

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