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Research Article

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Comparative Analysis of Sarus Crane Population from 2012-2019 in and around Alwara Lake of District Kaushambi (U.P.), India

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Abstract: The present study is designed to analyze the population of Indian Sarus Crane (*Grus antigone antigone*) in and around the Alwara Lake of district Kaushambi (Uttar Pradesh) India in 8 consecutive years from 2012 to 2019. The sarus crane is the only resident and non-migratory breeding crane of Indian subcontinent. This bird is now globally threatened due to the shrinking in the extent and quality of their wetland habitats, reduction in suitable mating sites and increased anthropogenic activities. In the present study, authors attempted to count the number of sarus crane in 8 consecutive years from 2012 to 2019 in the same study area. This systematic analysis reflects an increase in the number of sarus crane at sustainable level in the area studied.

Keywords: Alwara Lake, Conservation, Sarus crane, Threatened, Wetland.

INTRODUCTION

The sarus crane is World's largest flying bird, well known as an eternal symbol of unconditional love, devotion and good fortune with high degree of marital fidelity as they pair for lifelong (Verma 2018a). The sarus crane has now been declared as 'State Bird' by the Government of Uttar Pradesh. This monogamous, graceful water bird is large, long-legged and long-necked bird belonging to family: Gruidae, order: Gruiformes, class: Aves and phylum: Chordata. There are three subspecies of sarus crane namely the Indian Sarus crane *Grus antigone antigone*, Eastern Sarus crane *Grus antigone sharpii* and the Australian Sarus crane *Grus antigone gillae*. Sundar and Chaudhary (2003) gave the literature review of sarus crane in detail while Archibald *et al*., (2003) gave the first comparative review of these three subspecies.

The Indian sarus crane, *Grus antigone antigone* (Linnaeus, 1758) prefers to reside close to human habitation and open habitats like marsh areas, abundantly irrigated paddy fields, grass land and river banks as these areas suit them for foraging, roosting and nesting. Its occurrence represents a healthy wetland ecosystem.

A review of literature revealed that only a few attempts have been done to study the demography and status of Indian sarus crane on large scale in Uttar Pradesh. As far as the study of sarus crane from population dynamics and conservation point of view, in and around the Alwara Lake is concerned, has been done only by few Zoologists like Prakash *et al.*, (2014), Prakash and Verma (2016a) and Verma *et al.*, (2015), Verma and Prakash (2016a, 2016b, 2017, 2018a, 2018b and 2019). Prakash and Verma (2016b) and Verma and Prakash (2016c) have also worked on the suitable selection of nesting sites, nesting materials and their medicinal values of this crane. Verma (2018b) reported a positive correlation between the crane numbers and the area of agricultural land.

In the present study, authors attempted to count the number of sarus crane in 8 consecutive years from 2012 to 2019 in the

same study area and performed a systematic comparative analysis.

Study Area

The Alwara Lake (Google map 1) is a natural lake (Fig. 1) and a part of perennial marshy wetland and is situated between the latitude 25°24'05.84" S – 25°25'10.63" N and longitude 81°11'39.49" E-81°12'57.95" W with altitude MSL – 81.08 meter. It is surrounded by agricultural fields and is connected to the river Yamuna and Kishanpur lift canal and covers more than 1750 hectares. It is located in Sarsawan block of Manjhanpur tahsil of district Kaushambi of Uttar Pradesh. The lake is skirted by villages like; Ranipur, Dundi, Hatwa and Bhawansuri in the east, Paur Kashi Rampur, Alwara and Gaura in the north, Shahpur, Umrawan in the south and Mawai, Tikra and Dalelaganj in the west.

Map 1: Study Area in Kaushambi district (U.P.)

MATERIALS AND METHODS

Authors used binocular, camera, motorbike, chappu boat, field stick etc. for various purposes. Since sarus crane is a huge bird and visible from a distance by naked eyes hence crane count was easy. The study area was visited and examined regularly but the counting of sarus crane was accomplished on a single day to avoid the possible double counting due to local movements of the birds to neighbouring habitat. Authors recorded this water bird in maximum number during first week of June as they remain confined around the wetlands in search of water. Besides actual sightings, inquiries from local people were also made to ensure the estimate of existing population and their perceptions about the existence of the crane. All the observations were made while moving through the chappu boat and walking along the croplands, mud lands, natural areas using binoculars (7x35 and 8x40-BEZIF BM-9) and canon cameras.

Fig. 1: A view of Alwara Lake in Kaushambi district (U.P.).

Fig. 2: Sarus Crane pair in paddy field near Alwara Lake.

Identification, counting methods and other demographic parameters were aided by using standard guides such as Ali (1941), Wild Life Institute of India Wetland Research Methodology (1999) and methods adopted by Ali and Ripley (1980) and Aryal *et al*., (2009).

The authors visited the villages concerned a number of times at least two days per month, contacted the people and told as well as convinced them not to kill or hunt the sarus cranes, their eggs and juveniles. The authors organized awareness programs regularly with group of local people and continued it even when 1 or 2 villagers were there. They were detailed about legal aspect, protection, conservation and maintenance of its natural habitat. (Prakash and Verma, 2016c).

Fig. 3: Juvenile of Sarus Crane in study area.

RESULTS AND DISCUSSION

The Sarus Crane occurs mostly in pair (Fig. 2) or in pair with one or two juveniles or only juvenile (Fig. 3) or in congregation (Fig.4) and rarely single. During non-breeding season, cranes are seen in groups mostly in evening for mate finding or pair formation activities.

Prakash *et al.*, (2014) counted a population of 335 cranes in 2012 while Verma and Prakash (2016a, 2016b, 2017, 2018a, 2018b and 2019) counted their population as 425 in 2013; 510 in 2014; 537 in 2015, 575 in 2016; 605 in 2017 and 625 in 2018 respectively. In the present and latest study, authors collected a data of 650 cranes in the same study area in 2019. The result is shown in table and pie diagram (Fig. 5).

Table 1: Year wise number of Sarus Crane recorded from 2012 to 2019.

No. of cranes 2012	No. of cranes 2013	No. of cranes 2014	No. of cranes 2015	No. of cranes 2016	No. of cranes 2017	No. of cranes 2018	No. of cranes 2019
335	425	510	537	575	605	625	650

During study in and around Alwara Lake, authors noted that the presence of abundant paddy fields, land under irrigation, vegetation at the edge of the crop fields, type of crops grown, marshy wetland and the openness of habitat are the major factors for the existence and survival of sarus crane. Moreover, decrease in pollution level and reduction in harmful anthropogenic activities is other significant factors.

Fig. 4 : A congregation of Sarus Crane in Alwara Lake.

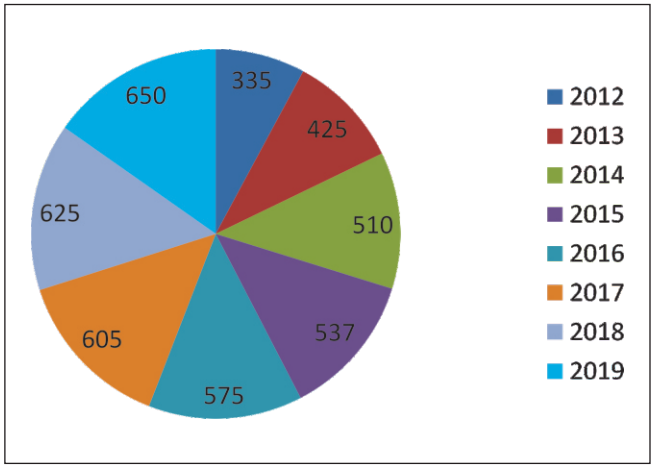

Fig. 5 : Pie-diagram to show year wise population of Sarus cranes from 2012 to 2019.

Due to widespread reductions in the extent and quality of their wetland habitats, unsustainable agriculture, unplanned irrigation, anthropogenic activities and ignorance of wild life rules and regulations, the number of sarus crane is gradually decreasing at global level. Due to its declining number, Indian Sarus Crane has been now listed as globally threatened *i.e.* vulnerable avian species (The IUCN Red List 2017 and Bird Life International, 2017).

Contrary to global scenario, the area studied by the authors, increasing trend of Sarus Crane number is seen from 2012 to 2019, as clearly shown by table and pie diagram. All these positive efforts, proper management and awareness campaigns finally led such a situation of increasing trend. It is not only a favourable site for sarus crane distribution but also support a wide variety of plants and other animals as well.

CONCLUSION

Thus, it can be concluded that there is a sustainable and continuous increase in the number of Sarus Crane, as indicated in the table and pie diagram. Prakash *et al*., (2014) and Verma and Prakash (2015, 2016b, 2017, 2018a and 2019) strongly argued that this is happening because of awareness of local people, sustainable conservation and management and quite supportive nature of ecological and environmental conditions in and around the Alwara Lake. The authors strongly recommend continuous population census of this bird and

declaration of the entire Alwara Lake as *Sarus Sanctuary* to make it safe zone for the conservation of Sarus Crane.

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