

Sustainable Conservation and Management of Indian Sarus crane (*Grus antigone antigone*) in and around Alwara Lake of District Kaushambi (U.P.), India

Ashok Kumar Verma¹, Shri Prakash²

Abstract

The Indian Sarus crane, *Grus antigone antigone* is the only resident breeding crane of Indian subcontinent that has been declared as 'State Bird' by the Government of Uttar Pradesh. This is one of the most graceful, monogamous, non-migratory and tallest flying bird of the world that pair for lifelong and famous for marital fidelity. Population of this graceful bird now come in vulnerable situation due to the shrinking of wetlands at an alarming speed in the country. Present survey is aimed to study the population of sarus crane in the year 2017 in and around the Alwara Lake of district Kaushambi (Uttar Pradesh) India and their comparison to sarus crane population recorded from 2012 to 2016 in the same study area. This comparison reflects an increasing population trend of the said bird in the area studied. It has been observed that the prevailing ecological conditions of the lake, crane friendly behaviour of the local residents and awareness efforts of the authors have positive correlation in the sustainable conservation and increasing population trends of this vulnerable bird.

Keywords: Alwara Lake; Conservation; Population Census; Sarus Crane; Increasing Trend.

Introduction

The Indian Sarus Crane, *Grus antigone antigone* (Linnaeus, 1758) prefers to inhabit close to human habitation. It belongs to phylum: Chordata, class: Aves, order: Gruiformes and family: Gruidae. Its population density is inseparably associated with wetland habitats. 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 gilliae*. Sundar *et al.*, (2003) gave the literature review of sarus crane in detail while Archibald *et al.*, (2003) gave the first comparative review of these three subspecies.

Due to widespread reductions in the extent and quality of their wetland habitats, exploitation and the effects of pollutants, unsustainable agriculture, unplanned irrigation and non-adoption of wild life rules and regulations as well, the number of sarus cranes is gradually decreasing at global level. Due to its declining number, Indian sarus crane has been now listed as globally threatened i.e. vulnerable

Author's Affiliation: ¹Head, Department of Zoology, Govt. P.G. College, Saidabad, Prayagraj, Uttar Pradesh 221508, India. ²Head, Department of Zoology, K.A.P.G. College, Prayagraj, Uttar Pradesh 211001, India.

Corresponding Author: Ashok Kumar Verma, Head, Department of Zoology, Govt. P.G. College, Saidabad Prayagraj, Uttar Pradesh 221508, India.

E-mail: akv.gdcz@gmail.com

Received on 26.11.2018, Accepted on 31.12.2018

avian species (The IUCN Red List 2017 and Bird Life International, 2017).

Only a few researchers have tried to study the demography, ecology and status of Indian sarus crane on large scale in Uttar Pradesh. As far as the study of this sarus crane from demographic and conservation point of view, in and around the Alwara lake is concerned, it is done only by few Zoologists like Prakash *et al.*, (2014, 2016a) and Verma *et al.*, (2015, 2016a, 2016b, 2017 and 2018). Prakash *et al.*, (2016b) and Verma *et al.*, (2016c) worked a little on the nesting materials, their medicinal values and suitable selection of nesting sites of this crane.

Present exploration is aimed to study the population of sarus crane in the year 2017 in and around the Alwara Lake of district Kaushambi (Uttar Pradesh), India and their comparison to sarus crane population recorded from 2012 to 2016 in the same study area.

Material and Method

The Alwara lake (Fig. 1, Google map) is a natural lake (Fig. 2) and a part of perennial 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 connected to the river Yamuna and covers more than 1750 hectares. It is located in Sarsawan block of Manjhanpur tahsil of Kaushambi district of Uttar Pradesh. The lake is skirted by villages like; Ranipur, Dundi, Hatwa and Bhawansuri in east, Paur Kashi Rampur, Alwara and Gaura in the north, Shahpur, Umrawan in the south and Mawai, Tikra and Dalelaganj in the west.



Fig. 1: Study area in Kaushambi district of U.P. (India).

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 hence sarus count was easy. The study area was visited and examined regularly but the counting of sarus crane was done during first and third Sunday of every month in the year 2017. This counting was accomplished on a single day to avoid the possible double counting due to local movements of the birds to neighbouring habitat. Authors recorded cranes in maximum number during third Sunday of June 2017 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.

Counting procedure, identification 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 *et al.*, (1980), Aryal *et al.*, (2009) and Jha *et al.*, (2014).



Fig. 2: A view of Alwara Lake with a pair of sarus crane

Result and Discussion

Sarus crane, the monogamous bird occurs mostly in pair (Fig. 3) or in pair with one juvenile (Fig. 4) or in pair with two juveniles (Fig. 5) and rarely in solo condition. During non-breeding season, cranes are seen in congregation mostly in evening for mate finding or pair formation activities. Prakash *et al.*, (2016a) reported a congregation of 155 cranes in 2014.

Prakash *et al.*, (2014) counted a population of 335 cranes in 2012 in three different transects of Alwara lake; Verma *et al.*, (2016a) counted their population as 425 in 2013; Verma *et al.*, (2016b) reported 510 cranes in 2014; Verma *et al.*, (2017) recorded 537 cranes in total in 2015 and Verma *et al.*, (2018) recorded 575 cranes in and around Alwara lake in 2016. In the latest survey, authors collected a data of 605 cranes in the same study area in 2017. The result is shown in table and pie diagram (Fig. 6).

Table 1: Year wise population of sarus crane from 2012 to 2017

| No. of cranes in 2012 | No. of cranes in 2013 | No. of cranes in 2014 | No. of cranes in 2015 | No. of cranes in 2016 | No. of cranes in 2017 |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 335 | 425 | 510 | 537 | 575 | 605 |

During demographic survey in and around Alwara Lake, authors realized that the presence of abundant paddy fields, land under irrigation, vegetation at the edge of the crop field, type of crop grown, wetland and the openness of habitat are the major factor for the existence and survival of sarus crane. Verma (2018) observed a positive correlation between the crane numbers and the area of agricultural land. Authors also observed that openness of habitat is a requirement for the existence and growth of the crane.



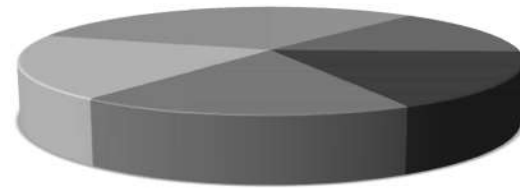
Fig. 3: Paired sarus crane in study area around Alwara Lake



Fig. 4: Sarus crane pair with one juvenile in mustard field around Alwara Lake



Fig. 5: Sarus crane pair with two juveniles in agro field around Alwara Lake



■ No. of cranes in 2012 ■ No. of cranes in 2015
 ■ No. of cranes in 2013 ■ No. of cranes in 2016
 ■ No. of cranes in 2014 ■ No. of cranes in 2017

Fig. 6: Pie diagram to show year wise population of sarus cranes from 2012 to 2017

The authors and their team visited the villages concerned a number of times especially on first and third Sunday of every 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 programme regularly with group of local people and continued it even when 1 or 2 villagers were there. They were trained about the safety of this sarus crane and its legal aspect was also explained. Importance of its protection, conservation and maintenance of its natural habitat were also emphasized (Prakash *et al.*, 2016c).

It is not only a favourable site for sarus crane distribution but also support a wide variety of other fauna and flora. Globally the sarus crane is threatened i.e. vulnerable avian species but in the area studied, its increasing trend is observed from 2012 to 2017, as clearly shown by table and pie diagram. All these positive efforts and proper management finally led such a sustainable state of conservation of this vulnerable bird.

Conclusion

In the present survey, a continuous gradual increase is clearly observed, as indicated in the table and pie diagram. This increasing population trend is an important aspect of sustainable conservation and management of the sarus crane in the area studied. Prakash *et al.*, (2014) and Verma *et al.*, (2015, 2016a, 2016b, 2017 and 2018) 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. A positive correlation was observed between the crane numbers and the wetland. This

conservation model can therefore be applied elsewhere for the conservation of other such species. 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.

Acknowledgements

Authors are highly grateful to Prof. Ashish Joshi, Principal Govt. P.G. College Saidabad, Prayagraj for providing necessary arrangement and facilities. Authors are also obliged to local Gram Pradhans and authorities of district administration Kaushambi, Uttar Pradesh for their co-operation during entire survey programme.

References

1. Ali S. The Book of Indian Birds. The Bombay Natural History Society, Bombay, 1941.p457.
2. Ali Salim and Ripley S.D., Handbook of the Birds of India and Pakistan, Vol. 2. Oxford University Press, New Delhi. 1980.
3. Archibald G.W., Sundar K.S.G and Barzen J. A review of the three subspecies of Sarus Cranes *Grus antigone*. *Journal of Ecological Society*. 2003;16: 5-15.
4. Aryal A., Shrestha T.K., Sen D.S., Upreti B. and Gautam N. Conservation regime and local population ecology of Sarus Crane (*Grus antigone antigone*) in west-central region of Nepal. *Journal of Wetlands Ecology* 2009;3:1-11; <http://dx.doi.org/10.3126/jowe.v3i0.2224>.
5. Bird Life International, (2017). Country profile: India. Available from <http://www.birdlife.org/datazone/country/india>. Checked: 2017-11-26.
6. Jha K.K. and McKinley C.R., (2014). Demography and Ecology of Indian Sarus Crane *Grus antigone antigone* in Uttar Pradesh, Northern India. *Asian Journal of Conservation Biology*. 2014;3(1):8-18.
7. Linnaeus Carolus. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis 1 (10th ed.). Stockholm: Laurentius Salvius. 1758.pp.[1-4], 1-824.
8. Prakash S. and Verma A.K. Marital fidelity and congregation of Indian sarus crane, *Grus antigone antigone* in and around Alwara lake of district Kaushambi (Uttar Pradesh), India. *International Journal of Biological Research*; 2016a;4(1):10-13. <http://www.sciencepubco.com/index.php/IJBR/article/view/5692>.
9. Prakash S. and Verma A.K. Studies on Use of Local Medicinal Flora in Nest Building by Threatened Bird, *Grus antigone antigone* in and around Alwara Lake of District Kaushambi (U.P.), India. *Journal of Applied Life Sciences International*. 2016b;5(3):1-7. DOI: 10.9734/JALS/2016/26383.
10. Prakash S. and Verma A.K. Impact of awareness programme on growth and conservation of vulnerable avian species *Grus antigone antigone* in and around Alwara lake of District Kaushambi (Uttar Pradesh), India. *The Journal of Zoology Studies*. 2016c;3(2):1-5.
11. Prakash S., Narain S. and Kumar S. Conservation of the threatened Sarus Crane *Grus antigone* (Linnaeus, 1758) around Alwara Lake in Kaushambi District, Uttar Pradesh, India. *Journal of Threatened Taxa*. 2014;6: 5726-5730. <http://dx.doi.org/10.11609>.
12. Sundar K.S.G. and Choudhary B.C. The Indian Sarus Crane *Grus a. antigone*: a literature review. *J. Ecol. Soc. (India)*. 2003;16:16-41.
13. The IUCN Red List of Threatened Species. Version 2017-2. <www.iucnredlist.org>. Downloaded on 26 November 2017.
14. Verma A.K. Positive correlation between Indian Sarus Crane and Agriculture. *Journal of Experimental Zoology India*; 2018;21(2):801-803.
15. Verma A.K., Prakash S. and Kumar, S. Status and Ecology of Sarus Crane, *Grus antigone antigone* in and around the Alwara Lake of District Kaushambi (U.P.). *International Journal on Environmental Sciences*. 2015;6(2):331-335.
16. Verma A.K. and Prakash S., (2016a). Demographic studies of Indian Sarus Crane, *Grus antigone antigone* in and around Alwara Lake of District Kaushambi (U.P.), India. *International Journal of Innovative Biological Research*. 2016a;5(1):1-4. <http://sci-edit.net/journal/index.php/ijibr/issue/view/22/showToc>.
17. Verma A.K. and Prakash S. Population dynamics of Indian Sarus Crane, *Grus antigone antigone* (Linnaeus, 1758) in and around Alwara lake of Kaushambi district (Uttar Pradesh), India. *International Journal of Biological Research*; 2016b;4(2): 206-210.
18. Verma A.K. and Prakash S. Selective behaviour of Indian Sarus Crane in choosing plant species for nest construction in and around Alwara Lake of district Kaushambi (U.P.), India. *International Journal of Zoology and Research*. 2016c;6(3):1-6.
19. Verma A.K. and Prakash S. Continuous Increase in Population of Indian Sarus Crane, *Grus antigone antigone* in and around Alwara lake of district Kaushambi (U.P.), India. *National Journal of Life Sciences*. 2017;14(2):143-146.
20. Verma A.K. and Prakash S. A study on the population scenario of Indian Sarus crane (*Grus antigone antigone*) in and around Alwara Lake of District Kaushambi (U.P.), India. *Asian Journal of Biology*. 2018;5(1):1-8.
21. Wildlife Institute of India, Training workshop on wetland research methodology measuring and monitoring biological diversity. WII. Dehra Dun, 1999.pp.5-10.