



Increase in Sarus Crane *Grus antigone* (Linnaeus 1758) Population in and Around Alwara Lake of District Kaushambi, India

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Abstract: The Sarus crane (*Grus antigone*) is a flagship species of marshland and wetlands. This is the only resident and non-migratory breeding crane of the Indian subcontinent. Its population is gradually decreasing and now globally threatened due to the shrinkage of wetlands, reduction in safe mating sites and enhanced anthropogenic activities. On the contrary, a remarkable increase of around 78% in the population of Sarus cranes was observed during a survey conducted from March 2020 to February 2021 in and around the Alwara Lake of district Kaushambi (Uttar Pradesh), India, as compared to 2013 population. This systematic survey was done to estimate an increase in the number of Sarus cranes during 2020-2021 when compared to their available population records between 2013 and 2019 from the same study area. This might be due to recent climatic, environmental and ecological progression along with continuous awareness campaigns started since 2012.

Keywords: Alwara Lake, Flagship species, Pandemic, Sarus crane, Vulnerable, Wetland

The Sarus crane (SC), *Grus antigone* (Linnaeus 1758) is world's largest flying bird acts as flagship and wetland indicator species (FWI 2013, Katuwal 2016, WWF 2021). This monogamous and graceful water bird is well known as an eternal symbol of unconditional love, devotion with high degree of marital fidelity as they pair for lifelong and absolutely devoted for each other (Ashok 2016, Prakash and Verma 2016a, Verma 2018a). The Sarus cranes are spectacularly impressive and reach up to the height of six feet with a wing span of about eight feet. The three subspecies of Sarus cranes are: Indian Sarus crane (ISC) *Grus antigone antigone*, Eastern Sarus crane (ESC) *Grus antigone sharpii* and Australian Sarus crane (ASC) *Grus antigone gillae*. Due to its declining number across the globe, the SC has been listed as vulnerable avian species (IUCN 2021). The SC 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 (Yav et al 2015, Verma and Prakash 2016a, Prakash and Verma 2016b). They show a strong correlation with agriculture especially paddy ecosystems and their occurrence represent a healthy wetland ecosystem (Verma 2018b). Sarus cranes are social creatures, mostly in pairs or in small groups (Verma and Prakash 2021). The compressive review of literature was given by Sundar and Chaudhary (2003) where as Archibald et al (2003) gave the comparative review of three subspecies. A number of researchers did their works related with habit, habitat,

population dynamics and conservation status of Sarus crane in India and Nepal (Vyas 2002, Aryal 2004, Aryal et al 2009, Tripathi 2014, Ghosh et al 2016, Tomar 2017, Kumar and Kanaujia 2017, Sengar 2018, Dashahre et al 2020, Malek et al 2020) but study of Sarus crane from population dynamics and conservation point of view, in and around the Alwara Lake is done only by few researchers (Verma et al 2015, Verma and Prakash 2018b, 2019, Prakash and Verma 2019).

In the present exploration, a systematic survey was done to estimate an increase in the number of Sarus cranes during 2020-2021 in order to know the degree of success of awareness campaign started by the authors since 2012, impact of Corona pandemic as well as lockdown and current scenario of their conservation status in and around the Alwara Lake of district Kaushambi (Uttar Pradesh), India.

MATERIAL AND METHODS

Study area: The Alwara Lake is a natural lake 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 (Fig. 1). It is surrounded by agricultural fields and covers more than 1750 hectares. 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. The study area was divided into three major transects based on its vastness, diversity and nature of habitat. These

transects were: (i) Paur Kashi Rampur, (ii) Tikara and (iii) Shahpur. The lake is connected to the river Yamuna towards transect III and terminal part of Kishanpur lift canal towards transect I.

Data collection: The binocular, camera, motorbike and chappu boat (Oar boat) etc. were used for the survey regularly but the counting of cranes was accomplished on a single day from 6 am to 7 pm in order to avoid the possible double counting due to local movements of the birds to nearby locations. The most of the parts of the lake both during the breeding and non-breeding seasons and counted the cranes by direct observations in all potential habitats of the study area were surveyed. Crane count was made in all the three different transects of the study area and the census route was decided in such a manner to ensure maximum coverage of each transect travelling a minimum distance of 2-3 km. The census was avoided during rainy days. Besides actual sightings, opinions and views from local people were also collected to ensure the existing population and their perceptions about the existence of the crane after the authors' awareness campaign and Corona pandemic as well as lockdown. Since SC was a huge bird and visible from a distance by naked eyes hence counting was done through a simple method of watching. Many local people cooperated well to count the SC. Identification, counting methods and other demographic parameters were aided by using standard guides such as Ali (1941), Wetland Research Methodology (1999), methods adopted by Ali and Ripley (1980) and Aryal et al (2009).

RESULTS AND DISCUSSION

The Sarus crane normally seen in pair (Fig. 2) or in pair with one or two juveniles (Fig. 3) or in flock (Fig. 4) and rarely solo. During non-breeding season, cranes are seen in flocks making a congregation mostly in evening for mate finding or pair formation activities. Authors noticed this aquatic bird in maximum number during first fortnight of June as they remain confined around the wetlands in search of water. In the present study, a sum of 755 cranes was observed in 2020 that reflects around 78 percent increase since 2013 (Table 1).

The Sarus crane is listed as vulnerable because it is suspected to have suffered a rapid population decline globally, which is projected to continue, as a result of widespread reductions in the extent and quality of its wetland habitats, exploitation and the effects of pollutants, unsustainable agriculture, unplanned irrigation (IUCN 2021). Water diversions and unsustainable conversion of wetlands, habitat loss, poisoning, increased anthropogenic activities, collisions with power lines, invasive species and changes in agricultural practices and ignorance of wild life rules and regulations are the major threats of this graceful bird

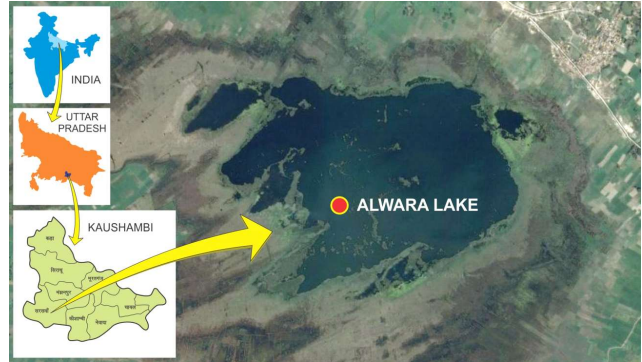


Fig. 1. Study area in Kaushambi district (U.P.), India



Fig. 2. Sarus crane pair in the bank of Alwara Lake



Fig. 3. Sarus crane pair with two juveniles in study area



Fig. 4. Flock of Sarus cranes in Alwara Lake

Table 1. Year wise number of sarus crane recorded from 2013 to 2020

Year	No. of cranes	Increase in crane population (approx.)	Citation reference
2013	425	--	Verma and Prakash (2016b)
2014	510	20%	Verma and Prakash (2016c)
2015	537	26%	Verma and Prakash (2017)
2016	575	35%	Verma and Prakash (2018a)
2017	605	42%	Verma and Prakash (2018b)
2018	625	47%	Verma and Prakash (2019)
2019	650	52%	Prakash and Verma (2019)
2020	755	78%	Current finding

(International Crane Foundation 2021, Prakash and Verma 2022). Contrary to global scenario, the area studied, normal increasing trend of Sarus crane number was seen from 2013 to 2019 (Table 1). Before awareness campaign, number of cranes was not much significant. During this current survey in and around Alwara Lake, 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 flourishing the cranes. The lockdown resulted into increased transparency of environment, abundance of food and other nutrients, availability of natural habitat for reproduction, decreased human activities and pollution level (Roy and Chaube 2021). In villages adjoining to Alwara Lake, a number of times especially on first Sunday of every month since 2012, contacted the people and told as well as convinced them spiritually not to kill or hunt these cranes, their eggs and juveniles. They were aware about the legal aspect, protection, conservation, and maintenance of its natural habitat (Prakash and Verma 2016c). The authors strongly recommend the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India for continuous population census of this flagship, vulnerable bird (State Bird of Uttar Pradesh) and declaration of the entire Alwara Lake as *Sarus Sanctuary* to make it safe zone for their conservation.

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