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**Prakash Shri**  
 Department of Zoology,  
 K.A.P.G. College, Prayagraj,  
 Uttar Pradesh, India

## Demographic variation in the population of Sarus crane in and around Alwara Lake of district Kaushambi, India

**Prakash Shri**

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### Abstract

The Sarus crane, *Grus antigone* is a monogamous, non-migratory and world's tallest flying bird. This is the only resident breeding crane of Indian subcontinent, prefers open habitat like marsh areas, abundantly irrigated paddy fields, grass land and wetland. Its population is gradually decreasing and now globally threatened due to the shrinkage of natural habitats and enhanced human activities. On the contrary, a remarkable increase in the population of Sarus cranes was observed during a survey exercised from January to December 2021 in and around the Alwara Lake of district Kaushambi (Uttar Pradesh), India. This systematic survey was conducted to estimate the demographic variations in the population of Sarus cranes from 2013-2021.

**Keywords:** Alwara lake, conservation, Sarus crane, vulnerable, wetland

### Introduction

The Sarus crane (SC), *Grus antigone* (Linnaeus, 1758) [15] acts as a flagship species of marshland and wetlands (Katuwal, 2016; Verma and Prakash, 2023) [11, 31]. The SC is the only resident and non-migratory breeding crane and world's tallest flying bird (Archibald *et al.*, 2003) [2]. This water bird is well known as an eternal symbol of marital fidelity (Prakash and Verma 2016; Verma 2018) [19, 25], however, some researchers consider it as notorious for the same (Kumar and Kanaujia, 2017) [12]. Due to its declining number across the globe, the SC has been listed as vulnerable avian species (IUCN, 2023).

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) [36, 27]. They show a remarkable correlation with paddy ecosystems and their occurrence represents a healthy wetland ecosystem (Verma and Prakash, 2021) [30]. Several researchers did their works related with habit, habitat, population dynamics and conservation status of Sarus crane in India and Nepal (Gole, 1989; Vyas 2002; Aryal *et al.*, 2009; Sengar, 2018; Malek *et al.*, 2020; Gulati and Rana, 2022) [7, 33, 3, 23, 17, 8] 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; Prakash and Verma, 2019; Verma and Prakash, 2019) [32, 20, 29].

In the present exploration, a systematic survey was conducted to find out the demographic variations in the population of Sarus cranes between 2013 and 2021 in and around the Alwara Lake of district Kaushambi (Uttar Pradesh), India.

### Materials and Methods

The Alwara Lake (Fig. 1) 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. 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.

**Corresponding Author:**  
**Prakash Shri**  
 Department of Zoology,  
 K.A.P.G. College, Prayagraj,  
 Uttar Pradesh, India

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 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. The SC is since a huge bird and visible from a distance by naked eyes hence counting was done through a simple method of watching. A large number of local people cooperated well to count the SC. Identification, counting and other demographic parameters were aided by the literature of Ali (1941) [1], Walkinshaw (1973) [34], Wetland Research Methodology (1999) and Aryal *et al.* (2009) [3].



**Fig 1:** Study area in Kaushambi district (Uttar Pradesh)

## Results and Discussion

The Sarus crane normally seen in pair (Fig. 2) or in pair with one or two juveniles or in groups and rarely single (Fig. 3). A sum of 425 cranes was reported in 2013 (Verma and Prakash, 2016b) [27], 510 in 2014; 537 in 2015 (Verma and Prakash, 2017) [28]; 575 in 2016, 605 in 2017, 625 in 2018, 650 in 2019 and 755 in 2020 (Verma and Prakash, 2023) [31] in and around the Alwara Lake of Kaushambi. In the present study, a sum of 765 cranes was observed in 2021 in the same study area. This growth in Sarus crane population reflects a pattern of clear cut increase since 2013.

The Sarus crane is listed as vulnerable (Birdlife International, 2016) [5] as it suffered a rapid population decline globally due to widespread reductions in the extent and quality of its wetland habitats, exploitation and the effects of pollutants, unsustainable agriculture, unplanned irrigation (IUCN, 2023) [10]. Unsustainable agriculture (Kumar, 2017) [12], use of pesticides (Prakash and Verma, 2014; Chaudhary *et al.*, 2021; Rani *et al.*, 2024) [18, 6, 22], water diversions and conversion of wetlands, habitat loss, pollution (Singh *et al.*, 2023) [24], poisoning, over anthropogenic activities (Prakash and Verma, 2022) [21], collisions with power lines, invasive species and changes in agricultural practices and ignorance of wild life rules and regulations are the major threats of biodiversity including this graceful bird (ICF, 2021). The pesticides used in fields pose a major threat to the birds. It interferes with supply of calcium that is essential for eggshell formation. If the eggshell is thin, it will be crushed as soon as the mother sits on it for hatching and will definitely reduce the population of Sarus cranes (Mahendiran *et al.*, 2020) [16]. Its responsibility of each and every one to conserve the biodiversity (Yong *et al.*, 2022) [37] and maintain the ecological balance which is necessary for the survival of

entire biotic lives including humans (Ashok, 2017; Kumar, 2018) [7, 14].



**Fig 2:** Sarus crane pair in agriculture field near Alwara Lake



**Fig 3:** Single Sarus crane in paddy crop in the study area of Alwara Lake

Contrary to global scenario, the area studied, a progressive increasing trend of Sarus crane population was seen from 2013 to 2021. From the above result it is evident that there is a progressive demographic variation in the population of Sarus cranes between 2013 and 2021 in and around the Alwara Lake of district Kaushambi (Uttar Pradesh), India. This might be due to climatic, environmental and ecological progression along with continuous awareness campaigns.

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