

# Breeding of Woolly-necked Stork *Ciconia episcopus* at Dhaniyavi, near Vadodara

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## Introduction

The Woolly-necked Stork or White-necked Stork (*Ciconia episcopus*) is a widespread tropical species, which breeds in Africa and in Asia, from India to Indonesia (Ali & Ripley 1987). It is a common resident bird of Gujarat (Parasharya *et al.* 2004, Ganpule 2016, 2020). It inhabits variety of wetlands and agricultural landscapes and feeds on fish, amphibians, reptiles and invertebrates (Ali 1996, Sundar 2006, Pande *et al.* 2007, Grimmett *et al.* 2011, Katuwal *et al.* 2020, Sundar 2020, Tiwary 2020). It is one of the least studied stork species with a vast majority of information on its ecology constituting of anecdotal observations (BirdLife International 2020, Sundar 2020). It is a Schedule IV species, protected under the Wildlife Protection Act, 1972 and included in the *Agreement on the Conservation of African-Eurasian Migratory Waterbirds* (AEWA) (Nanda 2006, Ganpule 2020). Their population was considered comparatively low and a total 462 birds were recorded from India in a census conducted in 1989 (Hancock *et al.* 1992). Recently, their population across South Asia and Southeast Asia is estimated to be 25,000 (Wetlands International 2020). However, Kittur & Sundar (2020) estimate their population to be much more ( $2,38,685 \pm 1,24,471$ ) in South and Southeast Asia. The species faces threats such as habitat loss and poaching of adults, chicks and eggs in Southeast Asia. Due to the threats it faces and lower population estimated earlier, it has been categorized as 'Vulnerable' by IUCN in 2017 (BirdLife International 2020).

The Woolly-necked Stork breeds in India between July and September in southern India, and December to March in northern parts of the country (Ali & Ripley 1987, Ishtiaq *et al.* 2004, Vyas & Tomar 2007). The breeding season varies within its range, from India to Indonesia in July– September, in December–March throughout Africa, and in February–May and August–November in Southeast Asia, where they probably breed all the year round (del Hoyo 1992, BirdLife International 2020). The nest is a large platform of sticks of 10–30 cm and occasionally, the nest is of about 50 cm diameter with a slight depression in the middle, usually built on branches of tall trees. The nests have been recorded on trees such as saman (*A. saman*), silk cotton (*Bombax ceiba*), north Indian rosewood (*Dalbergia sissoo*), *Eucalyptus sp.*, fig (*Ficus religiosa*), banyan (*F. bengalensis*), mango (*Mangifera indica*), *Salmalia sp.*, and tamarind (*Tamarindus indica*) (Hume 1890, Ali & Ripley 1987, Banerjee 2017, Choudhary *et al.* 2013, Greeshma *et al.* 2018, Ishtiaq *et al.* 2004, Kularatne & Udagedara 2017, Maduranga 2002).

I present here observations at a nest of Woolly-necked Stork near Vadodara.

## Study Area

Dhaniyavi Village (22° 12' 38.4" N, 73° 13' 47.68" E) is located in Vadodara Tehsil of Vadodara District in Gujarat, India. It is situated 13 km southeast from Vadodara City on Vadodara-Kayavarohan Road. It has a semi-arid climate with three distinct seasons viz. summer, monsoon and winter. The average maximum and minimum temperatures during summer and winter are about 45°C and 15°C respectively. The average rainfall is about 93 cm. Chikhodara Village (22° 14' 9.9" N, 73° 13' 51.62" E) is located 11 km southeast from Vadodara City and 2-3 km from Dhaniyavi Village on same road (Map 1).



Map 1: Study Area

## Methods

The area between Vadodara and Kayavarohan was surveyed regularly to study terrestrial and aquatic avifauna of this rural area during the monsoon season since the past two years. Frequent visits to the site were done after spotting an adult Woolly-necked Stork with nest material in its beak. All the observations were taken during morning hours between 09.30 hrs to 11.30 hrs. The birds and the nest were observed by using binoculars (10X50) and photographs were taken by using DSLR cameras (Canon 1100D with 50-250mm lens and Sony HX 400). As the nest was built on a tower, the observations were done from about 50 mts away from the ground at an angle of 45°. The data of height was taken directly from an information board mounted at the base of the tower. GPS locations were taken from mobile phones and Sony HX400 camera. Interactions with the local people were done to get

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information about the presence and nesting activities of the storks in the study area.

## Results

A pair of Woolly-necked Storks was observed near Chikodara Village on 23 August 2020 in an agricultural farm. The male and female were identified by their unequal size. On 16 September 2020, a single bird was observed collecting branches of Nilgiri (*Eucalyptus globulus*) tree at Dhaniyavi. The bird frequently collected small branches attached with leaves and rearranged them to the pre-built nest made of dried sticks. The nest was built on the top of a mobile/communication tower. The tower was more than 40 mts high and located at the edge of a road leading to Kayavarohan. There was a small open ground on one side of the road and village houses on the other sides. Tall trees such as neem, banyan, peepal etc. were surrounding the tower. Questioning the people of the village revealed that the bird was seen regularly in the agricultural farms but was recorded nesting on the tower for the first time. One bird was found sitting on the nest when the site was visited on 1 October 2020. Two chicks were found in the nest on 11 October 2020 while observing through binoculars. However, due to the height of the tower it was not possible to view the entire nest. A Jungle Crow (*Corvus macrorhynchos*) was spotted perching below the nest on the same tower. The site was visited again on 21 December 2020 and the nest was found deserted. However, I could not find the adult birds or the chicks in or around the village. Weekly visits of the site were not possible due to the Corona pandemic.

## Discussion

According to Legge (1880), Woolly-necked Stork prefers to nest in remote parts of dry zone forests of Ceylon with minimum disturbances. In the present study, the birds were recorded nesting in very close proximity of human settlements. Vaghela *et al.* (2015) also reported Woolly-necked Stork nesting in densely populated area of Dattavadi in Pune. In the present study, the storks used the communication tower for nesting despite the availability of many tall trees. It seems that the birds took advantage of the height of the tower. Hence, nesting on the tower might have provided stability and protection as it was about 40 mts from the ground. Nesting on communication tower by the Woolly-necked Stork was also reported at Chekhla, near Vayala, at Sanand, in 2020 (D. K. Das, *pers. comm.*). Adapting to the tower and nesting in or near human settlements suggests their adaptation to urban areas and supports previous studies (Vaghela *et al.* 2015, Banerjee 2017). Successful nesting of storks

on man-made towers can help sustain their population. However, the effect of radiation of towers, if any, needs to be studied in the future. This species is also recorded nesting on rock cliffs and using the abandoned nest of a Grey Heron (Rahmani *et al.* 1996, Banerjee 2017). Use of trees, towers, rock cliffs, abandoned nests of other species and utility towers by Woolly-necked Stork shows its rapid adaptability to the changing environment and taking advantage of available resources.

The height at which nests are built is around 20–30 mts in northern India (Ali & Ripley 1987). The maximum height of nest on a tree, from the ground, was recorded to be 47 mts by Kularatne & Udagedara (2017). The maximum height of a nesting tower reported earlier was 25 mts (Vaghela *et al.* 2015). In the present study, the nest was built at 40 mts, which is the maximum height of tower reported till date.

The Woolly-necked Stork is a frequently sighted species in wetlands and agricultural fields of Gujarat. However, there are very few published records of this species nesting in the state. Dharmakumarsinhji (1955) stated that the Woolly-necked Stork was resident in Gujarat and not uncommon but 'nesting only where conditions are favourable'. Ali (1954) stated that he had observed the species in Gujarat and noted it as 'not uncommon but sparse and local'.

However, there are records of its nesting here; a pair was regularly observed nesting on top branches of a tamarind tree near Vatarak Bridge in Kheda District from 2001 to 2003 (*pers. observations*). One pair was observed nesting for two successive years, from 1987 to 1988, at Vatarak Dam, near Satarada (Dr. P. S. Thakker, *pers. comm.*). A pair was observed nesting at Thol Bird Sanctuary by Viral Prajapati and Pankaj Maheria in 2014 (Prajapati & Maheria 2014). In 2020, the species was found nesting at Sanand, near Ahmedabad (Dr. Bakul Trivedi, *pers. comm.*), in Balaram-Ambaji Sanctuary, Banaskantha, by Anand Varde (Varde 2020) and at different sites from Vadodara District (Kartik Upadhyay & Neel Solanki, *pers. comm.*).

Though the Woolly-necked Stork has been recorded breeding in different location in Gujarat, there is a paucity of information regarding its breeding biology. There is an urgent need of documenting the nesting of Woolly-necked Stork to better understand their breeding biology in India.

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