ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IX September 2025

Impact of Tembhu Irrigation Project on Aquatic Biodiversity of Freash Water Wetland of Atpadi with Special Reference to Avifauna and Habitat Destruction.

Shivaji M. Vibhute

Shrimant Babasaheb Deshmukh Mahavidyalaya, Atpadi, India

DOI: https://doi.org/10.51584/IJRIAS.2025.100900081

Received: 17 Sep 2025; Accepted: 24 Sep 2025; Published: 22 October 2025

ABSTRACT

The Tembhu Lift Irrigation Project (TLIP), designed to deliver Krishna-river water to drought-prone Atpadi taluka, has transformed regional water availability. While supporting local agriculture, its effects on the aquatic ecosystem of freash water wetland of Atpadi especially avifaunal diversity and habitat structure are poorly understood. This study assesses changes in water quality, vegetation (macrophytes, plankton), fish assemblages, and bird populations tied to irrigation-induced hydrological alteration. Using comparative field surveys, water-quality analysis, and avifauna counts from pre-project (2013–2015) baseline data through present post-project flows, we examine biodiversity shifts and propose conservation recommendations.

Key Words: Tembhu, Avifauna, Conservation, Habitat.

INTRODUCTION

Atpadi in Sangli district receives only ~300–350 mm annual rainfall and has long suffered chronic droughts. The Tembhu Lift Irrigation Scheme was restructured in 2016–2018 on an equitable model to supply piped Krishna-water (~5,000 m³ annually per household) to villages in Atpadi and Sangola Tehesil using closed pipelines.

Atpadi Water reservoir, originally built in 1962 as a drinking and surface-water reservoir for the region, is a critical aquatic habitat. Baseline studies in Sangli district reservoirs (e.g. Nimbavade) reported 44 bird species, diverse phytoplankton (Chlorophyceae, Cyanophyceae, Bacillariophyceae, etc.) and important carp fish species ISCA.

This paper investigates how irrigation inflow alters lake hydrology, nutrient status, vegetation structure and bird habitat suitability.

Fig. 1: Atpadi Wetland

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IX September 2025

MATERIALS AND METHODS

Atpadi Lake is one of the small water-body located in an undisturbed area of Sangli district between 17°40'97.41"N and 74°91'186.66"E (Fig.1). It shows great avian biodiversity which can attract the attention of bird's watcher and ornithologist. The lake is surrounded by vast area of deserted land on western side while crop plantation is seen on eastern and southern side. Around this tank trees, herb and shrub is located with some stretch of grassland area. However the lake itself fits in the definition of wetland ecosystem. The lake was free of any type pollution as no human and industrial and other human activities polluting its water are observed in it catchment area before commence of Tembhu irrigation Project. Previously the avifauna was observed between June 2008 to May 2010. For observation of avifauna a binocular 10-12×50 Nikon binocular was used while for photography Nikkon camera was used. Generally the avifauna was observed in the morning between 6.00 am to 9.00 am in the morning and 4.00 pm to 6.00 pm in the evening. Identification of birds was done using field guides [1. 2, 9] and searching on internet. Classification of birds was carried out with aid of. Picture of study area was taken by using website Google earth and graphs were prepared by using the Microsoft Excel.

Post initiation of Tembhu Irrigation Project the wetland study with special reference to avifauna was conducted between March 2017 to February 2019. Contamination of water and change in physicochemical and biological properties were observed due to influx of polluted water coming from Krishna river. The waste water including domestic waste, industrial waste, etc. is observed coming from megacities like Satara, Karad, Koyananagar and villages and towns situated in Krishna basin.

RESULTS AND DISCUSSION

During present investigations 44 species of aquatic birds were recorded before initiation of Tembhu Project. They were belonging 16 families. Incidence of birds of regular occurrence in year 2008- 2009 and 2009-2010 was listed in Table No. 1 Out of all these birds observed at the site, some are resident birds like Kingfisher, Ibis, cormorant, Heron, Egret, etc. while some are migratory. They are Stork, Flamingo, Goose, etc. They migrate from Northern hemisphere to India- South-Western Maharashtra and scatter at various wetlands like this study area. The resident birds are observed in all the months of investigation period but the migratory birds are observed mostly in the winter months. According to this the population of migratory birds dominated the tank in winter as during these months the climatic conditions of northern hemisphere are harmful to these birds; especially in getting food and shelter, while at the same time in India- south-western Maharashtra, this season is best for getting food and shelter. The migratory species were winter visitors (Pandey 1993, Barman et al. 1995, Prakash 1999, Jyoti et al. 2001, Kumar and Bohra 2002, Malhotra Manjeet Prakas et al. 2005, Man Mohan Prakash 2005). The aquatic birds observed in the present investigations were grouped into Grebes, Cormorants, Herons, Egrets, Ducks, Cranes, Coots, Waders, Terns, King Fisher, Stork and Ibis, etc..

Post Tembhu Irrigation Project when the study was conducted from March 2017 to February 2019 change in physicochemical and biological properties were observed along with change in winter visitors and local aquatic avifauna as shown in Table No.2. Due to continuous influx of water for irrigation purpose the previously observed islands providing nesting and feeding grounds were found permanently submerged. Due to overflowing of this irrigation tank fall in growth of aquatic micro and macrophytes was seen, thus by destroying feeding ground of aquatic avifauna.

In the previous study species like Indian Pond Heron, Grey Heron, Giant Heron, Cattle Egret, Smaller Egret, Little Egret, Large Egret, Brahminy Duck, Pin tail, Open Bill Stork, Spoon Bill, Black Winged Stilt, Little Ringed Plover, White Breasted Kingfisher, Painted Stork, White Stork, White Necked Stork, etc. were seen and are carnivorous. They were found feeding upon aquatic insects and their larvae, molluscs, crustaceans, fishes, tadpoles, frog etc. The species of birds such as Common Pochard, Common Coot, Purple Moorhen, White Ibis, and Black Ibis were Omnivorous. Their food consisted of fruits, grains, shoots as well as insects, molluscs, worms etc. The species such as Common Teal, Spot Bill, etc. were Herbivorous. Their Food consisted of fruits, grains, shoots of gram etc. The species such as Little Cormorant, Pied King Fisher, Small

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IX September 2025

Blue King Fisher and River Tern were Piscivorus. Their Food consisted of fish species such as Labeo angra, Catla catla, Labeo Calbasu, Cirhinus fulungee, Cirrhinus Reba, Puntius amphibious, Mystus lamabaricus, M. Montanus etc. (Dhindsa and Toor 1986, Yahya 1988, Bharucha and Gogte 1990, Patel et.al 1992, Urfi 1992, Balchandran 1995, Salim Javed 1996 Sivaperuman and Jayson 2000, Rathore and Sharma 2000, Ramakrishna, Muley and Vasanth 2001, Steimetz, Kohler and Soluk 2003, Srinivasulu 2004, Kedar and Patil 2005). In the post initiation of Tembhu Irrigation Project major decline was observed in migratory visitors as well as local aquatic avifauna due to various factors like destruction of feeding ground, change in availability of macro and microphytes along with change in other physical and chemical parameters,

Present lake was extremely productive in terms of food, plants and animals, because the temperature of water was often lower than that of the surrounding air, it acts as valuable feeding havens during the cold. In addition it provides water for drinking, bathing and offers protection from land predators. It was not surprising therefore that this freshwater habitat was previously home of many bird species and visited by many other bird species not primarily adapted to aquatic life. Most of these are equally familiar in standing and flowing water, because of their size and the tendency of some types of flock together. Populations of aquatic birds are more likely to be found on lake, due to the amount of food needed to support them.

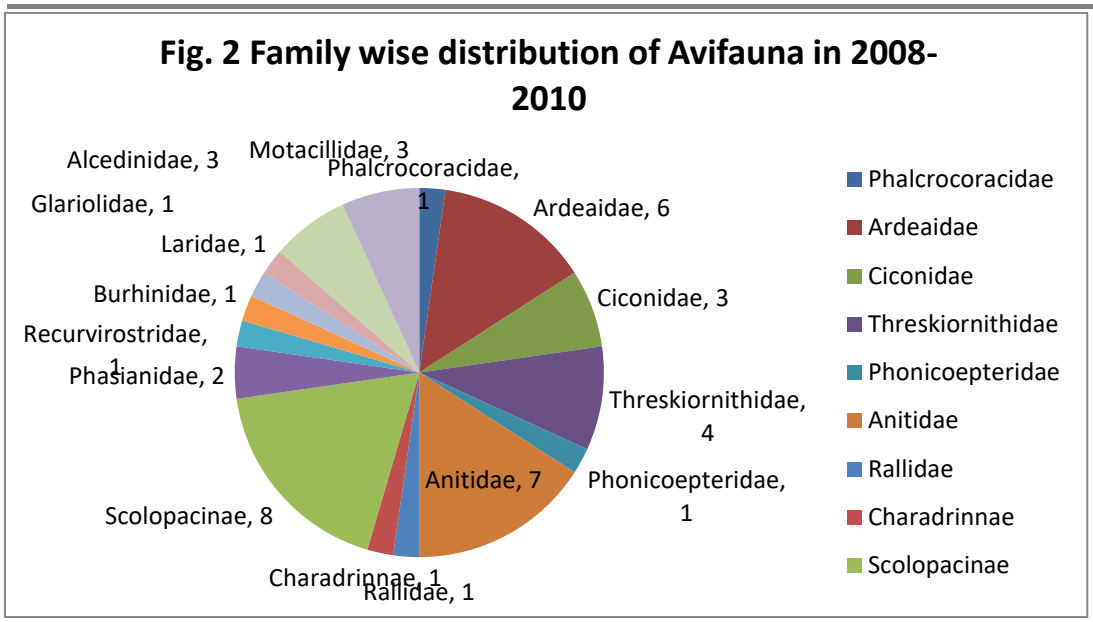
Table .1 Comparative Avifauna observed in study conducted from 2008-2010 and 2017-2019

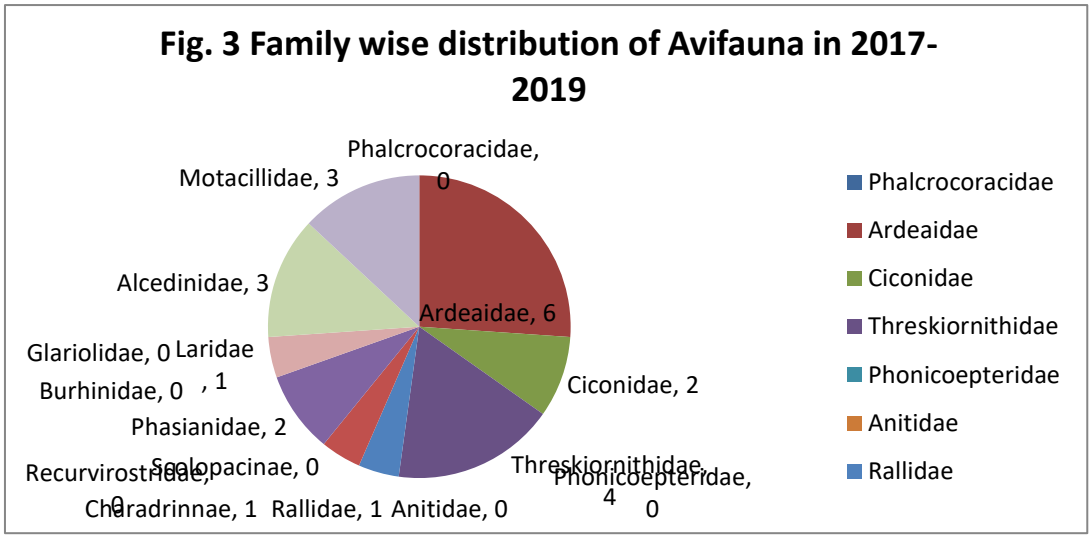
Sr.No.	Common Name	Scientific Name	2008-2010	2017-2019
1	Little Cormorant	Phalacrocorax fuscicollis	✓	✗
2	Grey Heron	Ardea cinerea	✓	✓
3	Large Egret	Casmerodius albus	✓	✓
4	White Bellied Heron	Ardea insignis	✓	✓
5	Little Green Heron	Butorides striatus	✓	✓
6	Median Egret	Mesophoyx intermedia	✓	✓
7	Little Egret	Egretta garzetta	✓	✓
8	Painted stork	Mycteria leucophalia	✓	✓
9	Asian Openbill Stork	Anastomous oscitans	✓	✗
10	White Necked Stork	Ciconia episcopus	✓	✓
11	Eurasian spoon bill	Platelea leucorodia	✓	✓
12	White Ibis	Threskiornis melanocephalus	✓	✓
13	Black ibis	Pseudibis papillosa	✓	✓
14	Glossy ibis	Plegadis falcinellus	✓	✓
15	Greater Flamingo	Phoenicopterus rubber	✓	✗
16	Northern Pintail	Anas acuta	✓	✗
17	Common Pochard	Aethya ferina	✓	✗

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IX September 2025

18	Bar Headed Goose	Anser indicus	✓	✕
19	Brahminy Shelduck	Tadorna ferruginea	✓	✕
20	Spot Billed Duck	Anas poecilorhyncha	✓	✕
21	Wigeon	Aethya penelope	✓	✕
22	Common Teal	Nettapus coromandelianus	✓	✕
23	Common coot	Fulica atra	✓	✓
24	Little Ringed Plover	Charadrius dubius	✓	✓
25	Spotted Red Shank	Tringa erythropus	✓	✕
26	Marsh Sandpiper	Tringa stragnatilis	✓	✕
27	Common Green Shank	Tringa nebularia	✓	✕
28	Little Stint	Calidris minuta	✓	✕
29	Dunlin	Calidris alpine	✓	✕
30	Curlew Sandpiper	Calidris ferruginea	✓	✕
31	Black Tailed Godvit	Limosa limosa	✓	✕
32	Common Sandpiper	Actitis hypolecos	✓	✕
33	Purple Moorhen	Porphyrio porphyrio	✓	✓
34	White Breasted Waterhen	Amaurornis phoenicurus	✓	✓
35	Black Winged Stilt	Himantopus himantopus	✓	✕
36	Great Stone Plover	Esacus recurvirostris	✓	✕
37	Small Pratincole	Glareola lactea	✓	✕
38	River Tern	Sterna aurantica	✓	✓
39	Lessar Pied Kingfisher	Ceryle rudis	✓	✓
40	White Breasted Kingfisher	Halcyon smyrnensis	✓	✓
41	Small Blue Kingfisher	Alcedo atthis	✓	✓
42	Yellow Wagtail	Motacilla flava	✓	✓
43	White Wagtail	Motacilla alba	✓	✓
44	Forest Wagtail	Dendronanthus indicus	✓	✓

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IX September 2025





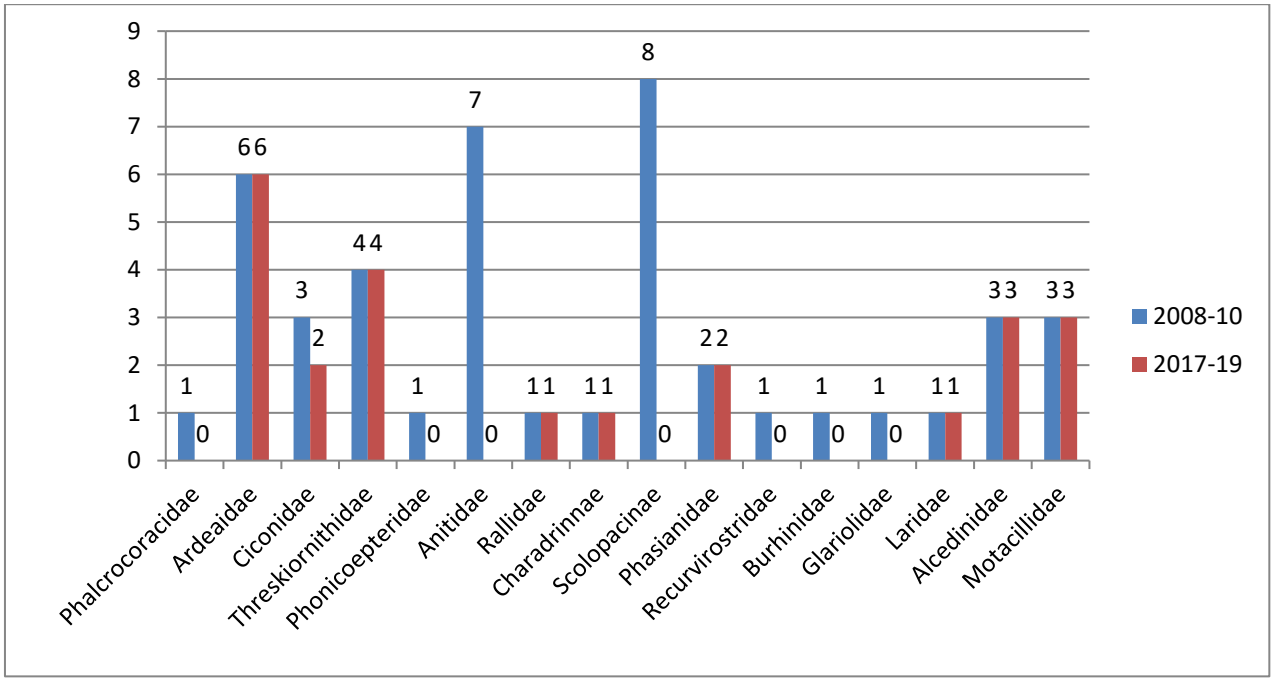


Figure. 4 - Comparative family wise abundance of avifauna in 2008-10 and 2017-19

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IX September 2025

ACKNOWLEDGEMENTS

The author wish to express deep sense of gratitude to all peoples who helped me and Mr. Ashok Khade, of Forest Office, Maharashtra Gov. for allowing me in the research area to carry out my research work.

REFERENCES

1. Ali S. Oxford University Press, **2002,** Delhi.
2. Ali S, Ripely SD. Oxford University Press, **1987,** Delhi.
3. Anon, Wetland values and functions. The Ramsar Bureau. Gland, Swittzerland. **2000,** Pp. 20-25.
4. Bhattacharjee PC, Hazarika BC. Roosting sites and roosting birds at Gauhati Muncipal area. In Second intenational symposium on life sciences. November, 14-16, **1985,** NEHU Shillong.
5. Dayananda GY. Our Nature **2009,** 7: 100-109.
6. Deepa RS, Ramachandra TV. Impact of urbanization in the interconnectivity of wetlands. Paper presented at the National Symposium on Remote Sensing Applications for Natural Resourses: Retrospective and Perspective (XICXXI,**1999**), Indian Society of Remote Sensing, Banglore.
7. Grimmett R, Inskipp C, Inskipp T. Christopher Helm **1998,** London.
8. Grimmet R, Inskipp C, Inskipp T. Oxford University Press **1999,** Delhi.
9. Hosetti BB, Somnath BC, Naik KL. Vol.1. Daya Publishing House, Delhi. **2001,** pp. 269-289.
10. http://data.gbif.org/search.
11. Kumar P, Gupta SK. Our Nature **2009,** 7:212- 217.
12. Padmavati A, Alexandar R, Anbarashan M. Our Nature **2010,** 8: 247-253.
13. Sanjay GS. An ecological study of birds at Kokkare Bellur. WWF-India, New Delhi. **1993.** Final Report.
14. Sharma IK. Adverse effects of air, water and soil pollutions on flora and fauna of towns and villages of Western Rajasthan. In Symposium on environment consciousness, problems of pollution and conservation in Rajasthan **1982.** October 1-3.
15. Singh JP, Roy SP. Some aspects of ecology of birds of Kawar Lake, **1990,** Bihar.