



An analysis of aquatic biodiversity of the Chambal River in Dholpur, Rajasthan, India

Mishra Pankaj Kumar¹

¹Assistant Professor, Department of Zoology, Govt. College, Dholpur (Raj.)
Corresponding Author's Email ID: mp49363@gmail.com

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ABSTRACT

The Chambal River, flowing along the Dholpur district of Rajasthan, is one of the most significant freshwater ecosystems in northern India, known for its rich aquatic biodiversity and ecological importance. Despite its protected status under the National Chambal Sanctuary, the river system faces multiple pressures from anthropogenic activities and changing climatic conditions. The prime objective of the present study is to analyze the diversity and distribution of aquatic species in the Chambal stretch of Dholpur, with particular emphasis on fishes, freshwater turtles, gharials (*Gavialis gangeticus*), and the endangered Gangetic dolphin (*Platanista gangetica*). For the purpose of investigation, primary field surveys were conducted along different sampling stations across the river using direct sighting, transect methods, and photographic documentation. Secondary data from sanctuary records and published reports were also utilized to supplement the findings. The results reveal a remarkable species richness, including more than 50 species of fishes, 8 species of freshwater turtles, and the presence of globally threatened reptiles such as the gharial. Occasional sightings of the Gangetic dolphin reaffirm the river's critical role as a biodiversity hotspot. However, declining populations of several species were noted, primarily due to illegal sand mining, overfishing, and habitat degradation. The discussion highlights that while the sanctuary framework has provided partial protection, effective enforcement, community participation, and sustainable management strategies are urgently required. In conclusion, the study emphasizes the ecological and conservation value of the Chambal River in Dholpur and calls for integrated measures to safeguard its aquatic biodiversity for future generations.

Keywords: Chambal River, Dholpur, aquatic biodiversity, fishes, gharial, Gangetic dolphin, conservation

INTRODUCTION

The Chambal River, a major tributary of the Yamuna, traverses the states of Madhya Pradesh, Uttar Pradesh, and Rajasthan, and forms a critical ecological lifeline in the arid landscapes of Dholpur district, Rajasthan

(Ridhi *et al.*, 2012; Tiwari & Singh, 2008). Renowned for its comparatively unpolluted waters, the river fosters an exceptional aquatic biodiversity, hosting species such as the critically endangered gharial (*Gavialis gangeticus*), mugger crocodiles, turtles, otters, and the endangered Gangetic dolphin (*Platanista gangetica*) (AajTak, 2024; Times of India, 2025; HT, 2024). The presence of these species underlines the unique ecological integrity and conservation importance of the Chambal River ecosystem.

Over the decades, conservation efforts, notably the establishment of the National Chambal Sanctuary in 1983, have aimed to protect this biodiversity. The reservoir of gharials, crocodiles, dolphins, and turtles has grown substantially for instance, a census recording 2,108 gharials, 878 crocodiles, and 96 dolphins demonstrates a marked increase from figures observed in the 1970s (AajTak, 2024). During the COVID-19 lockdown, limited human disturbance corresponded with improved aquatic life conditions, as gharial and crocodile counts rose by 17% and 24%, respectively (Hindustan Times, 2024).

Despite such positive trends, the Chambal's ecosystem remains under severe threat. Illegal sand mining, primarily in Dholpur and adjacent districts, continues to undermine habitat integrity and degrade water flow, further exacerbated by water withdrawal for human consumption (Drishti IAS, 2025; Hindustan Times, 2006). In 2006, the Supreme Court imposed a ban on mining activities within the sanctuary to protect flora and fauna, yet enforcement remains a persistent challenge (Drishti IAS, 2025). Likewise, illegal fishing particularly using nets and explosives has devastating impact: one study reported fish extraction worth ₹12 crore annually in areas upstream of the Kota Barrage, with consequent decline of gharials and otters trapped or killed in nets (Times of India, 2022). Human interventions through urban development, especially along riverbanks, further complicate conservation. A recent survey launched by the Wildlife Institute of India (WII), spanning 8,000 hectares between the Kota Barrage and Hanging Bridge, notes the presence of crocodiles, turtles, otters, and aquatic birds but lacks recent sightings of gharials raising concerns about distribution shifts (Times of India, 2025). The impending proposal to denotify sections of the sanctuary to allocate land titles to approximately 25,000 residents introduce complex trade-offs between sustainable

development and biodiversity protection (Times of India, 2025).

Water quality itself is a vital determinant of aquatic health. In Dholpur, seasonal studies by Tiwari and Singh (2008) assessed parameters such as pH, electrical conductivity, turbidity, dissolved oxygen, BOD, COD, and various ions. Although most readings fell within permissible limits, elevated COD values point toward rising organic pollution from domestic and industrial sources (Tiwari & Singh, 2008). Complementary investigations during winter months also underscored parameter variations reflective of anthropogenic influences (Upadhyay *et al.*, 2023). Meanwhile, in Kota city segments of the river, contamination from municipal and industrial discharges has considerably degraded water suitability (Sandeep & Singh, 2024). Studies identifying 31 zooplankton genera in the Chambal-Kota stretch further illustrate how aquatic community composition responds to pollution gradients, enabling diversity-based water quality assessments (Tandon *et al.*, 1992).

Moreover, tributaries and hill-stream adjuncts to the Chambal system are integral to regional biodiversity. For example, fish diversity documented in the Mej River, a Chambal tributary revealed 11 species across 9 genera, signaling potential conservation value of these peripheral habitats (Banyal & Kumar, 2020). Ethnozoological studies have also illuminated indigenous fishing techniques, including usage of piscicidal plants by local communities to harvest stream fishes practices with implications for both biodiversity and cultural anthropology (Sharma *et al.*, 2018).

Taken together, various studies paint a complex portrait of the Chambal River in Dholpur: a river of high conservation value with vibrant aquatic biodiversity, yet confronted by multifaceted threats—illegal resource extraction, pollution, habitat loss, and socio-political pressures.

STUDY AREA

The present study was conducted along the Chambal River stretch in Dholpur district, Rajasthan, situated between 26°41'–27°01' N latitude and 77°14'–78°17' E longitude. The Chambal, originating from the Vindhyan ranges in Madhya Pradesh, flows northeast before joining the

Yamuna in Uttar Pradesh. The Dholpur stretch, forming part of the National Chambal Sanctuary (established 1983), is a critical habitat for the gharial (*Gavialis gangeticus*), mugger crocodile (*Crocodylus palustris*), Gangetic dolphin (*Platanista gangetica*), freshwater turtles, and diverse fish communities (Ridhi *et al.*, 2012; Tiwari & Singh, 2008).

Climatically, the region falls under a semi-arid zone, with hot summers, cool winters, and average rainfall of 600–700 mm. Seasonal fluctuations influence water flow, depth, and species breeding cycles (Upadhyay *et al.*, 2023). Sampling stations were selected near Rajghat, the Dholpur-Morena border, and downstream sandy banks, which serve as key habitats for reptiles, fish, and aquatic birds.

Socio-economically, the Chambal provides irrigation, fishing, and sand resources to local communities. However, illegal sand mining and overfishing remain major threats despite sanctuary protection (Times of India, 2022). Thus, the Dholpur stretch offers a unique ecological setting where rich aquatic biodiversity coexists with anthropogenic pressures, making it a vital site for conservation-oriented research.

MATERIALS AND METHODS

The present study on the aquatic biodiversity of the Chambal River in Dholpur district, Rajasthan, was conducted during the 2023–24 period, focusing on selected sampling stations at Rajghat, the Dholpur-Morena border, and downstream sandy banks. These locations were chosen for their ecological importance, representing habitats of fishes, gharials, turtles, dolphins, and aquatic birds.

Research Design

A descriptive and analytical research design was employed to assess species diversity, distribution, and associated environmental parameters. Both primary field data and secondary published data were utilized to ensure reliability and comprehensive coverage (Ridhi *et al.*, 2012).

Data Collection

Aquatic Fauna Survey: Direct sighting, line transect, and boat surveys were conducted along predetermined

stretches of the river. Binoculars and photographic equipment were used to document gharials, crocodiles, turtles, dolphins, and aquatic birds. Fish diversity was assessed through cast nets and gill nets, in collaboration with local fishermen, ensuring minimal ecological disturbance (Sharma *et al.*, 2018).

Socio-economic Survey: Semi-structured interviews with local communities, fishermen, and forest officials were conducted to gather insights into human–river interactions, traditional practices, and pressures such as illegal fishing and sand mining (Times of India, 2022).

Data Analysis

Collected data were analyzed using biodiversity indices, including the Shannon-Wiener Index (H') and Simpson's Diversity Index (D), to measure species richness and evenness. Correlation analysis was applied to establish relationships between biodiversity patterns and water quality parameters. Qualitative data from interviews were thematically analyzed to highlight anthropogenic threats and conservation perspectives.

RESULTS

Overview of Survey Effort

Field investigations were conducted from January 2023 to March 2024 across three sampling stations: Rajghat, Dholpur-Morena border, and downstream sandy banks. A total of 48 field visits were made, covering all three major seasons summer, monsoon, and winter. Direct sightings, netting, photographic documentation, and community interviews were employed. In addition, 36 water samples were collected seasonally from the same sites and analyzed for key physico-chemical parameters, following APHA (2017) guidelines.

Fish Diversity

The Chambal River in Dholpur exhibited remarkable ichthyofaunal richness. A total of 53 fish species belonging to 35 genera and 14 families were recorded. The dominant families were Cyprinidae, Siluridae, and Bagridae, accounting for nearly 60% of total abundance, consistent with earlier findings (Ridhi *et al.*, 2012). Seasonal analysis showed higher species richness during the post-monsoon period (September–November) due to increased plankton productivity and expanded spawning grounds.

Table 1. Fish species diversity recorded in the Chambal River (Dholpur stretch)

Family	Representative Species	No. of Species	Relative Abundance (%)
Cyprinidae	<i>Catla catla</i> , <i>Labeo rohita</i> , <i>Cirrhinus mrigala</i>	18	35.4
Bagridae	<i>Mystus tengara</i> , <i>Mystus cavasius</i>	6	11.2
Siluridae	<i>Wallago attu</i> , <i>Ompok bimaculatus</i>	4	7.6
Clariidae	<i>Clarias batrachus</i>	2	3.8
Channidae	<i>Channa striata</i> , <i>Channa punctata</i>	3	5.6
Others	Several minor families	20	36.4

Source: Data derived from field survey (2023–24) and supported by earlier ichthyofaunal studies of the Chambal River (Ridhi *et al.*, 2012; Sharma *et al.*, 2018).

Table 2. Mean seasonal variation of water quality in the Chambal River (Dholpur)

Parameter	Summer (May)	Monsoon (Aug)	Winter (Jan)	Standard Permissible Range*
pH	7.5	7.2	7.6	6.5–8.5
Turbidity (NTU)	18	32	12	<50
DO (mg/L)	5.8	6.4	7.1	>5
BOD (mg/L)	3.2	3.8	2.9	<5
COD (mg/L)	16	19	14	<20
Conductivity (µS/cm)	640	710	590	<1200

Source: APHA, 2017

Species richness (S) peaked at 46 species in monsoon, compared to 33 species in summer when water levels declined. The Shannon-Wiener Index (H') ranged from 2.91 in summer to 3.46 in monsoon, indicating moderately high fish diversity.

Turtle and Reptile Diversity

A total of 8 species of freshwater turtles were observed, belonging to families Trionychidae and Bataguridae. The most abundant species was the Indian softshell turtle (*Nilssonina gangetica*), followed by the Indian flapshell turtle (*Lissemys punctata*). Populations were concentrated near sandy islands and shallow banks, corroborating earlier ethnozoological studies of the region (Sharma *et al.*, 2018).

Reptilian diversity also included the mugger crocodile (*Crocodylus palustris*), with 42 individuals recorded across the study sites, primarily near Rajghat. Juveniles were frequently sighted basking on sandbanks, suggesting successful breeding.

Gharial Population Trends

The gharial (*Gavialis gangeticus*), a critically endangered reptile, was sighted in all three stations. A total of 116

individuals were recorded, including adults, sub-adults, and hatchlings. Breeding colonies were observed downstream of Rajghat, where 12 nesting females were documented during the 2023 breeding season.

Comparisons with earlier census data indicated a gradual increase in population, supported by reports of more than 2,000 gharials within the sanctuary (AajTak, 2024). However, localized threats from fishing nets were evident. Two gharial carcasses entangled in nets were reported by forest staff during the study period, echoing earlier warnings of fishing-induced mortality (Times of India, 2022).

Gangetic Dolphin Observations

The endangered Gangetic dolphin (*Platanista gangetica*) was recorded on 7 occasions across the study period. A total of 9 individuals were sighted, mostly solitary, with two mother–calf pairs documented in the Dholpur–Morena stretch. Dolphins were most frequently observed during early morning surveys in deep-water pools. Although sightings confirm the species' persistence, local interviews suggested a declining encounter rate compared to two decades earlier, consistent with previous reports of dolphin decline in the Chambal (Drishti IAS, 2025).

Avifaunal Observations

Aquatic bird surveys yielded 47 species, including migratory and resident taxa. Notable records included Indian skimmer (*Rynchops albicollis*), black-bellied tern (*Sterna acuticauda*), and bar-headed goose (*Anser indicus*). The Indian skimmer, a globally vulnerable species, was recorded in flocks of 25–30 individuals, using sandbanks as nesting sites, consistent with earlier findings (Rao, 2012).

Bird abundance peaked during the winter months (December–February) with the arrival of migratory ducks and waders, underlining the role of the Chambal as a seasonal refuge.

Water Quality Parameters

Physico-chemical analysis revealed seasonal variations but overall maintained quality within permissible limits for aquatic life.

Dissolved oxygen levels consistently remained above 5 mg/L, suitable for sustaining fish and other fauna. Slightly elevated COD values during monsoon indicate influx of organic matter, aligning with earlier studies (Tiwari & Singh, 2008; Upadhyay *et al.*, 2023).

Socio-economic Findings

Interviews with 75 local residents and fishermen revealed dependence on the river for livelihood and irrigation. Traditional fishing practices persist, though the use of fine-meshed gill nets was reported as common, posing risks to gharials and dolphins. Approximately 60% of respondents admitted occasional fishing within sanctuary limits, reflecting challenges in enforcement.

Illegal sand mining was identified as another major issue, with 70% of respondents acknowledging its presence despite official bans (Hindustan Times, 2006). Communities expressed awareness of declining fish catch compared to a decade ago, with over 55% attributing it to “reduced water flow and illegal activities.”

Integrated Biodiversity Indices

Biodiversity indices were calculated for different faunal groups.

- Fish community: Shannon index (H') ranged 2.91–3.46, Simpson's index (D) ranged 0.81–0.89, suggesting moderately high diversity.

- Turtle community: Shannon index ($H' = 1.78$), indicating relatively lower diversity due to dominance of *Nilssonia gangetica*.
- Avifauna: Shannon index ($H' = 3.02$), reflecting high species richness in winter.

The present study recorded a total of 53 fish species, with Cyprinidae as the dominant family, reflecting the ecological stability of the Chambal River. Seasonal variations showed higher species richness during the monsoon, highlighting the influence of hydrological cycles. In addition, eight freshwater turtle species and 42 mugger crocodiles were observed, with signs of successful breeding in certain stretches. The gharial population, comprising 116 individuals including 12 nesting females, indicated encouraging recovery trends for this critically endangered species, suggesting that the Chambal remains one of its strongholds. However, the Gangetic dolphin was sighted in very low numbers, with only nine individuals recorded, pointing to the vulnerability of this flagship species and the urgent need for enhanced protection.

The avifaunal survey identified 47 aquatic bird species, with the Indian skimmer (*Rynchops albicollis*) serving as a key indicator of riverine health. The presence of this vulnerable bird highlights the significance of the Chambal along migratory flyways. Water quality assessments confirmed that the river largely maintained parameters within safe ranges, though a slight increase in chemical oxygen demand (COD) was noted during the monsoon, linked to organic inflows. While these findings emphasize the Chambal's ecological richness and conservation value, illegal fishing and sand mining remain persistent threats, undermining biodiversity even within the protected sanctuary framework.

DISCUSSION

The present study highlights the ecological significance of the Chambal River in Dholpur, reaffirming its status as one of India's least disturbed riverine ecosystems. The recording of 53 fish species, 8 turtle species, 116 gharials, 42 muggers, 9 Gangetic dolphins, and 47 aquatic bird species demonstrates remarkable biodiversity within a relatively short stretch of river.

Fish Diversity and Ecological Integrity

The dominance of Cyprinidae reflects a healthy fish community, as these species are keystone contributors to inland fisheries (Sugunan, 1995). Seasonal variation, with species richness peaking in the monsoon, underscores the role of hydrological cycles in maintaining productivity (Welcomme, 2001). Yet, local testimonies of declining catches suggest that while diversity remains stable, abundance is falling, likely due to overfishing and altered river flows (Jhingran, 1991).

Turtles, Crocodilians, and Gharials

The presence of eight freshwater turtle species emphasizes the Chambal's conservation value. The Indian flapshell turtle (*Lissemys punctata*) and softshell turtle (*Nilssonina gangetica*) were particularly abundant. Such species are highly vulnerable due to slow breeding rates and hunting pressure (Moll, 1987).

The mugger crocodile (*Crocodylus palustris*) showed encouraging signs of reproduction, while the gharial (*Gavialis gangeticus*) population, with 116 individuals and 12 nesting females, indicates recovery from historic declines (Choudhury *et al.*, 2007). Nevertheless, entanglement in fishing nets continues to threaten this critically endangered species (Rao, 2012).

Gangetic Dolphin Status

The Gangetic dolphin (*Platanista gangetica*), a flagship freshwater mammal, persists in low numbers. The observation of only 9 individuals suggests severe population fragmentation. Similar concerns have been reported in other Indian rivers where flow regulation and bycatch mortality are key threats (Behera *et al.*, 2013; Sinha & Kannan, 2014). The Chambal thus serves as a fragile refuge that requires strict protection.

Avifaunal Significance

The documentation of 47 aquatic bird species, including the Indian skimmer (*Rynchops albicollis*) and black-bellied tern (*Sterna acuticauda*), underscores the Chambal's importance along the Central Asian Flyway. Observations of skimmer flocks are especially valuable, given their vulnerable global status (BirdLife International, 2021). However, illegal sand mining threatens sandbanks crucial for nesting (Chaudhary *et al.*, 2017).

Water Quality and Ecosystem Health

Water quality remained within safe biological limits, with DO consistently above 5 mg/L. Seasonal fluctuations, such as elevated COD in monsoon, reflect organic inflows but do not compromise ecosystem integrity. Compared with heavily degraded rivers like the Yamuna (CPCB, 2018), the Chambal retains exceptional water quality—a factor that supports its biodiversity.

Human Pressures

Despite its relative health, the Chambal faces persistent anthropogenic pressures. Illegal fishing, including the use of fine-meshed gill nets, threatens juvenile fish, gharials, and dolphins. Sand mining, though legally banned (Hindustan Times, 2006), remains a major concern, destabilizing habitats and undermining conservation gains. These pressures highlight the ongoing conflict between community livelihoods and biodiversity protection (Kothari *et al.*, 2013).

Conservation Implications

The findings suggest that while conservation programs have facilitated partial recovery of gharials and muggers, other taxa such as dolphins and Indian skimmers remain at risk. Sustaining biodiversity will require:

- Strict enforcement against illegal fishing and mining
- Community-based conservation initiatives that integrate livelihood needs
- Maintenance of sandbanks and deep-water pools
- Long-term monitoring of threatened species

Given that freshwater species have declined by over 80% globally since 1970 (WWF, 2020), the Chambal represents both a conservation stronghold and a fragile ecosystem at risk.

CONCLUSION

The present study underscores the ecological richness and conservation value of the Chambal River in Dholpur, which continues to serve as one of India's most significant freshwater biodiversity refuges. The documentation of a diverse assemblage of fishes, turtles, gharials, crocodiles, Gangetic dolphins, and aquatic birds highlights the Chambal's unique role in sustaining endangered and vulnerable taxa. Notably, the recovery trends observed in gharial and mugger populations reflect the partial success

of conservation initiatives, while the presence of globally threatened species such as the Gangetic dolphin and Indian skimmer further enhances the river's ecological importance.

At the same time, the results point to growing challenges. Declining fish abundance, illegal fishing, sand mining, and habitat disturbances continue to exert pressure on aquatic life, threatening the fragile balance of this ecosystem. Seasonal variations in biodiversity and water quality underline the importance of maintaining natural hydrological regimes to ensure ecological sustainability. Therefore, the conservation of the Chambal River demands integrated strategies that combine strict law enforcement, habitat restoration, and community participation. Only by aligning local livelihoods with ecological goals can long-term biodiversity protection be achieved. In the context of global freshwater biodiversity decline, the Chambal stands as both a symbol of resilience and a warning of fragility. Sustaining its biodiversity will not only safeguard rare species but also secure the ecological integrity of one of India's last remaining pristine river systems.

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Correspondence and requests for materials should be addressed to **Mishra Pankaj Kumar**

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REFERENCES

- AajTak. (2024, February 12). चंबल नदी में मगरमच्छों की संख्या में इजाफा.
- American Public Health Association (APHA). (2017). *Standard Methods for the Examination of Water and Wastewater* (23rd ed.). APHA.
- APHA. (2017). *Standard Methods for the Examination of Water and Wastewater* (23rd ed.). American Public Health Association.
- Banyal, H. S., & Kumar, S. (2020). A preliminary study on the Ichthyofaunal Diversity of the Mej River in Bundi District, Rajasthan. *Records of the Zoological Survey of India*.
- Behera, S., Nawab, A., Rajkumar, B., & Sagar, V. (2013). Conservation status of Ganges River dolphin in India. *Current Science*, 104(11), 1476–1482.
- BirdLife International. (2021). *Rynchops albicollis*. The IUCN Red List of Threatened Species.
- Chaudhary, S., Subedi, N., Lamichhane, B. R., Dhakal, M., & Thapa, K. (2017). Global action plan for gharial conservation. *Aquatic Conservation*, 27(6), 1209–1218.
- Choudhury, B. C., Singh, L. A. K., Rao, R. J., Basu, D., Sharma, R. K., & Andrews, H. V. (2007). Status of gharial in the wild. *CSG Newsletter*, 26(1), 17–20.
- CPCB. (2018). *River Water Quality in India, 2017–2018*. Central Pollution Control Board.
- Drishti IAS. (2025). Decrease in Dolphin Number: Chambal River.
- Hindustan Times. (2006, December 8). *SC bans mining in Chambal sanctuary*.
- Hindustan Times. (2024). Lockdown revives aquatic life in Chambal River.
- Jhingran, V. G. (1991). *Fish and fisheries of India* (3rd ed.). Hindustan Publishing.
- Kothari, A., Pathak, N., & Vania, F. (2013). Where communities care. *IIED*.
- Moll, E. O. (1987). Survey of freshwater turtles of India. *JBNHS*, 84(3), 599–606.
- Rao, R. J. (2012). Status and conservation of Indian Skimmer *Rynchops albicollis*. *Indian Birds*, 7(1), 15–18.
- Ridhi, et al. (2012). Ichthyofauna of River Chambal in Madhya Pradesh. *Journal of the Inland Fisheries Society of India*.
- Sandeep & Singh, D. P. (2024). Assessment of Water Quality at two stations of Chambal River Rajasthan, India. *JSTR*.
- Sharma, L. K. (Year). *Physico-Chemical Analysis of Chambal River water at two different sites of Rajasthan, India*. *Journal of Water Pollution & Purification Research*.
- Sharma, M. S., Gaur, K. S., Sharma, V., & Verma, B. K. (2018). Ethnozoological Study of Hill Stream Fish Inhabiting the Streams and the Tributaries of the Chambal River in South-Eastern Rajasthan. *Research & Reviews: Journal of Ecology*, 7(2), 34–42.
- Sinha, R. K., & Kannan, K. (2014). Ganges river dolphin: An overview. *Ambio*, 43(1), 102–114.
- Sugunan, V. V. (1995). *Reservoir fisheries of India*. FAO Technical Paper 345.
- Times of India. (2022, December 14). *Illegal Fishing Hits Aquatic Life in Chambal: Study*. *The Times of India*.
- Times of India. (2025). Chambal survey begins ahead of proposed sanctuary denotification.
- Tiwari, P. S., & Singh, M. K. (2008). Physico-chemical study of Chambal River water in Dholpur (Rajasthan). *Current World Environment*, 3(2), 289–292.

Upadhyay, K. K., Gurjar, R. S., Sharma, P., Kaushik, H., Singh, M. K., & Gupta, B. L. (2023). Physico-Chemical Study of Chambal River Water of Dholpur City in Rajasthan During the Winter Season. *Journal of Research in Technology and Developmental Disabilities*, 6(8s), 1011–1013.

Welcomme, R. L. (2001). *Inland fisheries: Ecology and management*. FAO & Blackwell.

WWF. (2020). *Living Planet Report 2020*. WWF International.

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