

## BIODIVERSITY SURVEY OF GANDHISAGAR RESERVOIR, MADHYA PRADESH

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### ABSTRACT

The paper presents the results of the biodiversity survey of Gandhisagar Dam situated on the state boundary of Madhya Pradesh and Rajasthan. Various methods were used to survey the macro diversity such as fishes, reptiles, birds, mammals and plants. Eight plant species were found among which *Vallisneria spiralis* was predominant. Faunal survey resulted in 21 species of fish, eight reptiles, 139 birds and one mammal species. Gandhisagar Reservoir is under threat due to human activities which has resulted in the gradual decrease of biodiversity in the region.

### KEYWORDS

Biodiversity, checklist, Gandhisagar Reservoir

Gandhisagar Dam is a part of an ambitious project taken up to provide irrigation facilities and to generate hydel power, jointly, for the states of Madhya Pradesh and Rajasthan. The Chambal Valley Project was completed in three stages. In the first stage, Gandhisagar Dam and Kota Barrage were completed in 1960 and in later stages, Rana Pratap Sagar Dam and Jawaharsagar Dam were commissioned in 1970 and 1973, respectively. River Chambal originates at Janapao in Indore District and traverses a distance of 1,056km before joining river Yamuna at Pachnada in Uttar Pradesh. The river meanders its way through Malwa and Hadoti plateau and passes through the great boundary fault between Vindhya and Aravalli Mountain ranges to finally emerge in the Gangetic Plains.

Gandhisagar Reservoir (GR) covers an area of 660km<sup>2</sup> making it one of the largest inland water bodies. Its catchment area is 23,025km<sup>2</sup> and it collects the major part of drainage discharge from Kshipra, Shivana, Retam, Chhoti Kali Sindh, Ansar, Rупania and Tilsoi rivers. The fresh water wetlands face multiple threats to their existence, which has caused a havoc on the fresh water resources of the country. Haphazard damming of rivers, deforestation in the catchment areas, civic and industrial waste disposal, release of untreated sewage, contamination with pesticide residue, eutrophication, soil erosion causing heavy siltation are some of the leading factors resulting in the death or annihilation of the fresh water resources.

The purpose of the study was to survey the macro diversity of the major inland wetlands of Madhya Pradesh and Chhattisgarh. The present paper is a result of the biodiversity survey of GR.

### STUDY AREA

Gandhisagar Dam (22°44'N & 75°22'E) is situated on the state boundary of Madhya Pradesh and Rajasthan spreading over 660km<sup>2</sup>. The reservoir at its full capacity is 399.9m and its average area is 402km<sup>2</sup>. The maximum length of the reservoir is 67.8km and its maximum breadth is 26.1km. The construction of the dam was started in 1954 and it was commissioned in 1960. Two-

hundred-and-twenty-eight villages were fully or partially submerged due to flooding. Full submergence is achieved, when the water level in the dam is approximately 50m, but due to scanty rainfall in past three years, its capacity utilization has dropped by more than 40%. During the study period in December-January 2001-2002, the water level was 381.9m, which resulted in reduction in the area of submergence by approximately 250km<sup>2</sup>. Many large islands had reappeared in the reservoir and vast land on both the banks had been reallocated for cultivation by the state government. The technical details of the dam and the reservoir are provided in Table 5.

### MATERIALS AND METHODS

The expanse of Gandhisagar Reservoir was covered by scanning both the banks from various points and extensive boat rides were undertaken to survey. On the eastern bank, the avian and floral diversity was observed from dam site, Modimata, Bhanpura, Kanwala, Raipuria and Pipalda, whereas on the west bank, observations were taken between Gandhisagar and Rampura by walking along the bank. Observations were made with a 8 x 40 Minolta and 10 x 50 Zenith binoculars and Konus telescope. The macro flora was collected from the banks as well as from shallower parts and islands during the boat and ferry rides. Fishes were taken at fish collection sites and fish dispatch depot of Madhya Pradesh Matsya Mahasangh Ltd. Fishes collected were sent for laboratory investigations at Salim Ali Centre for Ornithology and Natural History, Coimbatore. The mammalian, avian and reptilian diversity was personally observed and secondary information from reliable sources was collected.

### RESULTS AND DISCUSSION

The aquatic flora of Gandhisagar Reservoir shows predominance of riverine macrophytes. During the study period, eight plant species belonging to five genera were collected from the reservoir (Table 4). The GR is a vast expanse of deep and open water, having massive jungle of *Vallisneria spiralis* growing from a depth of approximately 4m. Rest of the plants were found in shallower marginal waters in thick clumps, intermingled with each other. The female flowers of *Vallisneria*, on their extremely long pedicels were most abundant in the month of January. Fortunately, GR and its feeder streams on the upstream side are free of *Eichhornia*, which is quite common after Jawaharsagar Dam and has become a menace to the canal system at Kota and downstream of Kota Barrage.

A detailed study on the fisheries in GR conducted by Rao *et al.* (1998) accounts for 41 species of fish. Another study conducted before the construction of the dam by Dubey *et al.* (1959), reported the occurrence of 54 species of fish from Chambal River in this region. Presently, it has become a *Catla* reservoir as it is the most abundant fish besides *Rohu* and *Mrigal*. Some of the

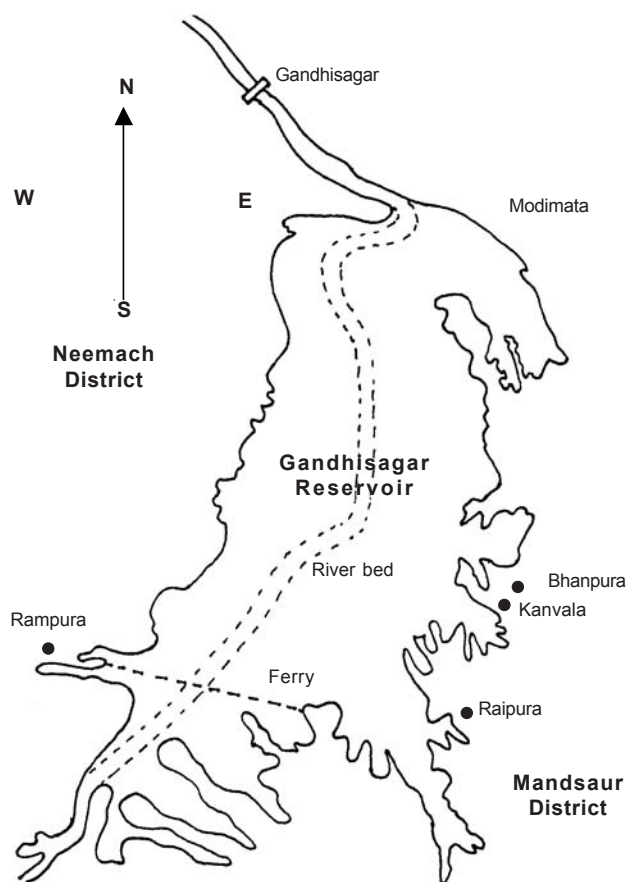


Figure 1. Gandhisagar Reservoir

other local major and local minor fishes are *Labeo calbasu*, *L. goni*, *L. bata*, *L. boggut*, *Ompok bimaculatus*, *Wallago attu* and *Cirrhinus reba*. Among game fishes Mahseer is still found, though in smaller numbers and size (147 Mahseer caught in 2000-2001 together weighed just 386.5kg.). In the present survey, we could see and collect 21 species of fish, of which *Chels laubaca* has not been reported earlier by Rao *et al.* (1988). The fall in the fish diversity could be attributed to the change in wetland type from riverine to reservoir and also due to the promotion of commercial fisheries in which market-friendly species are introduced and stocked.

The family Crocodylidae was represented by one species *Crocodylus palustris* or Mugger. The species is fairly widely distributed throughout the length of the reservoir and looks to be fairly safe. The Gavial was neither seen by us nor reported by the fisherfolk, who are well acquainted with the area. Common Indian Monitor (*Varanus bengalensis*) was seen on the banks. Five species of turtles and one land tortoise were found (Table 2). Rao (1991) reported seven turtles from Chambal, out of which *Kachuga dhongoka* and *Chitra indica* were not found in GR but additionally, land tortoise *Geochelone elegans* was abundant on some of the islands. Reportedly, turtle egg and meat is consumed by Bengali fisherfolk working in the area. *Kachuga kachuga*, *Aspideretus gangeticus* and *Lissemys punctata*,

protected under Schedule I of the Indian Wildlife (Protection) Act, 1972 occur in GR.

Smooth-coated Indian Otter *Lutra perspicillata* was a common sight throughout the length of the Chambal River. It has almost vanished downstream of Ranapratapsagar Dam and reappears only near Dholpur after a gap of almost 400km. The anecdotal accounts available at Kota suggest that until about 40 years back, it was a common sight in Chambal. We were particularly keen on reestablishing its present status. During this survey, we could record it from Gandhisagar and Ranapratapsagar reservoirs. Two otter families were sighted right below the guest house of the forest department at Gandhisagar. It was fairly common in all the suitable habitats, i.e., small fingers of shallow water in the rocky banks of the reservoir.

The avifauna of Chambal River and its environs was studied by Sharma *et al.* (1995), Vyas (1998), and, Rao (1988). These studies were primarily conducted in National Chambal Gharial Sanctuary between Kota and Morena. One-hundred-and-ninety-two bird species were reported by Vyas (1998), which included wetland and terrestrial birds. Since this survey was conducted during summer, a number of migratory waterfowls and waders could be included in this list from the earlier checklists prepared by Sharma (1995), and, Rao (1988). The present biodiversity study of GR is the first attempt to record avian diversity of this area. We recorded 139 species (Table 1) of birds from the environs of GR. It will be evident from the list that a number of marshland and sand bank inhabitants like waders, plovers, curlews, godwits, snipes have been recorded in large numbers, signifying the fact that by January each year vast land comes out of submergence and offers ideal feeding conditions to these birds. The presence of some of the exclusive piscivores like cormorants, darters, and terns were conspicuous due to their good numbers. Most of the geese and ducks common to central India were present, but prominent among them were Bar-headed Goose, Greylag Goose, Wigeon, Spotbilled Duck and Gadwal. The absence of Comb Duck and Cotton Teal is also noteworthy. The sighting of Sarus Crane and Common Crane is important in view of their present status. Sarus Crane is a threatened species in most of its earlier known home range.

We found that once the river enters the valley about 6km upstream of the dam and 1km on its downstream side, the numbers and sightings of vultures and other raptors increased significantly. Five species of vultures were sighted, including the Critically Endangered White-backed Vulture and Long-billed Vulture. Fortunately, both the vultures were breeding in the close vicinity of the reservoir. Imperial Eagle, Crested Serpent-eagle, Osprey, Montagu's and Marsh Harrier, Kestrel and White-eyed Buzzard were some of the noteworthy raptors recorded from the study area. The immediate environs of the reservoir show a variety of ecosystems, which is reflected in their avian diversity. The forest on the west bank of GR is home to parakeets, owls, drongos, malkohas, treepie, Asian Paradise Flycatcher, White-browed Fantail-flycatcher and babblers. The drying margins of the reservoir support various wagtails and pipits. Larks, wheatear, chats, quails, partridge, sparrows and munias

have been recorded from grassland habitat with scattered bushes.

It is evident that the GR supports a number of threatened mammal, bird, reptile and fish species and any alteration or degradation of this habitat due to natural or man-made causes may adversely affect its biodiversity. It is also obvious that man would not remain unaffected by these changes as his very survival depends upon the web of life supported by GR and its life sustaining water.

#### Socio-economic impact of fisheries

Gandhisagar Reservoir, besides irrigating 1.70 lakh hectare of farmland and producing 115 MW of electricity, is a mega producer of freshwater fishes in the country. The fisheries operations have been channelised through a fisherman's co-operative federation, named Madhya Pradesh Matsya Mahasangh Ltd. This Mahasangh is a conglomerate of various smaller societies, which number 21 and have a membership of 1,896 individuals. In the year 2000-2001, 1,489 fishermen were directly or indirectly involved with fisheries operation and they comprised of various Bengali, Bhoi, Bihari, Kahar, Keer and Mallah communities.

The fish production has been falling over the last six years and has dropped from 2,965 metric ton in 1995-96 to 1,248.35 metric ton in 2000-2001, thereby recording a fall of almost 60%. The employment has remained almost constant as about 1,500 fishermen worked for 238, 149, 146, 177, 172 and 194, days between 1995-1996 and 2000-2001. The average market rate of the fish has also stagnated at about Rs. 11/- per kg. The average annual earning of a fisherman has come down to Rs. 20,485.00 in 2000-2001, which had peaked at Rs. 29,360.00 in the year 1998-1999. The annual report of the M.P.M.M.S. gives Rs. 105.59 as the per day income of a fisherman, but if this income is annualized, then the per day income drops to Rs. 68.28, which is well below the subsistence level.

A fisher's housing colony of 100 houses with water and electricity has been constructed at Rampura under National Fisherman Welfare Plan, but such initiatives are few and benefit fewer people. Health, sanitation, child education, women's welfare and training are some of aspects of life, which are in need of immediate attention of the management of M.P.M.M.S. Efforts should be made to provide alternative employment to fisherfolk during their lay-off periods, so as to augment their earning potential and keep them off antisocial activities.

#### Threats and potential

The wetland loss could be due to direct human action, indirect human activity or natural causes. Experts believed that Gandhisagar Dam would survive for 100 years but probably, the rate of environmental degradation and its possible impact was not taken into account. A dam management policy statement was also not made, which would have provided guidelines for various activities in the watershed areas of the reservoir. As a result, the reservoir has gotten filled, anywhere close to its capacity (over 396m), only during nine monsoon seasons in 23 years (1980-2002). The threats and existing potential of GR is

enumerated below.

#### **Threats**

##### Direct and indirect human action:

a. Discharge of pesticides, herbicides - eutrophication, biotic loss; b. discharge of domestic sewage - eutrophication, change in pH; c. agricultural run-off and sediment; d. alteration of upper watershed - construction of dams, anicuts on feeder streams; e. cultivation on thousands of hectares of dry reservoir bed in drought years; f. deforestation; g. introduced species - extinction of native biota.

The aesthetic, religious and historical importance of the river and reservoir for local people and its tourism potential have remained untapped.

##### Natural causes: a) drought, b) soil erosion

Potential: a) historical, archaeological and religious - tourism; b) biodiversity - forest resources, wildlife resources, fisheries, forage resources; c) recreation - boating, bird watching, nature walk, adventure sports.

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Table 1. Systematic list of the birds of Gandhisagar Reservoir and its immediate environs

Scientific name	Common name	Scientific name	Common name	Scientific name	Common name
<u>Podicipedidae</u>			Waterhen	<i>Mirafr erythroptera</i>	Red-winged Bush Lark
<i>Phalacrocorax carbo</i>	Great Cormorant	<i>Fulica atra</i>	Common Coot	<i>Galerida cristata</i>	Common Crested Lark
<i>Phalacrocorax fuscicollis</i>	Indian Shag	<u>Charadriidae</u>		<u>Hirundinidae</u>	
<i>Phalacrocorax niger</i>	Little Cormorant	<i>Charadrius alessandrini</i>	Kentish Plover	<i>Hirundo concolor</i>	Dusky Crag-martin
<i>Tachybaptus ruficoffis</i>	Little Grebe	<i>Charadrius dubius</i>	Little Ringed Plover	<i>Hirundo daurica</i>	Red-rumped Swallow
<u>Anhingidae</u>		<i>Vanellus indicus</i>	Red-wattled Lapwing	<i>Hirundo rustica</i>	Common Swallow
<i>Anhinga melanogaster</i>	Darter	<i>Vanellus leucurus</i>	White-tailed Lapwing	<i>Hirundo smithii</i>	Wire-tailed Swallow
<u>Ardeidae</u>		<u>Scolopacidae</u>		<u>Motacillidae</u>	
<i>Ardea cinerea</i>	Grey Heron	<i>Actitis hypoleucos</i>	Common Sandpiper	<i>Anthus rufulus</i>	Paddyfield Pipit
<i>Ardeola grayii</i>	Indian pond-heron	<i>Calidris minuta</i>	Little Stint	<i>Anthus spinoletta</i>	Water Pipit
<i>Bubulcus ibis</i>	Cattle Egret	<i>Calidris temminckii</i>	Temminck's Stint	<i>Motacilla alba</i>	White Wagtail
<i>Butorides striatus</i>	Little Green Heron	<i>Gallinago gallinago</i>	Common Snipe	<i>Motacilla cinerea</i>	Grey Wagtail
<i>Casmerodius albus</i>	Large Egret	<i>Limosa limosa</i>	Black-tailed Godwit	<i>Motacilla maderaspatensis</i>	Large Pied Wagtail
<i>Egretta garzetta</i>	Little Egret	<i>Numenius arquata</i>	Eurasian Curlew	<u>Pycnonotidae</u>	
<i>Mesophoyx intermedia</i>	Median Egret	<i>Philomachus pugnax</i>	Ruff	<i>Pycnonotus cafer</i>	Red-vented Bulbul
<u>Ciconiidae</u>		<i>Tringa erythropus</i>	Spotted Redshank	<u>Turdinae</u>	
<i>Ciconia episcopus</i>	White-necked Stork	<i>Tringa glareola</i>	Wood Sandpiper	<i>Cercomela fusca</i>	Indian Chat
<i>Ciconia nigra</i>	Black Stork	<i>Tringa nebularia</i>	Common Greenshank	<i>Chrysomma sinense</i>	Yellow-eyed Babbler
<i>Myateria leucocephala</i>	Painted Stork	<i>Tringa ochropus</i>	Green Sandpiper	<i>Oenanthe picata</i>	Variable Wheatear
<u>Threskiornithidae</u>		<i>Tringa stagnatilis</i>	Marsh Sandpiper	<i>Oenanthe isabellina</i>	Isabelline Wheatear
<i>Platalea leucorodia</i>	Eurasian Spoonbill	<i>Tringa totanus</i>	Common Redshank	<i>Phoenicurus ochruros</i>	Black Redstart
<i>Pseudibis papillosa</i>	Black Ibis	<u>Recurvirostridae</u>		<i>Saxicola caprata</i>	Pied Bushchat
<u>Anatidae</u>		<i>Himantopus himantopus</i>	Black-winged Stilt	<i>Saxicola torquata</i>	Common Stonechat
<i>Anas acuta</i>	Northern Pintail	<u>Burhinidae</u>		<i>Saxicoloides fulicata</i>	Indian Robin
<i>Anas clypeata</i>	Northern Shoveller	<i>Esacus recurvirostris</i>	Great Stone-Plover	<i>Turdoides malcolmi</i>	Large Grey Babbler
<i>Anas crecca</i>	Common Teal	<u>Laridae</u>		<i>Turdoides striatus</i>	Jungle Babbler
<i>Anas penelope</i>	Eurasian Wigeon	<i>Chlidonias hybridus</i>	Whiskered Tern	<u>Sylviinae</u>	
<i>Anas poecilorhyncha</i>	Spot-billed Duck	<i>Larus brunicephalus</i>	Brown-headed Gull	<i>Culicicapa ceylonensis</i>	Grey-headed Flycatcher
<i>Anas querquedula</i>	Garganey	<i>Larus ichthyaetus</i>	Pallas's Gull	<i>Ficedula parva</i>	Red-throated Flycatcher
<i>Anas strepera</i>	Gadwall	<i>Larus ridibundus</i>	Black-headed Gull	<i>Phylloscopus collybita</i>	Common Chiffchaff
<i>Anser anser</i>	Greylag Goose	<i>Sterna acuticauda</i>	Black-bellied Tern	<i>Sylvia curruca</i>	Common Lesser Whitethroat
<i>Anser indicus</i>	Bar-headed Goose	<i>Sterna aurantia</i>	River Tern	<u>Monarchinae</u>	
<i>Aythya ferina</i>	Common Pochard	<u>Columbidae</u>		<i>Terpsiphone paradisi</i>	Asian Paradise-Flycatcher
<i>Aythya fuligula</i>	Tufted Pochard	<i>Columba livia</i>	Blue Rock Pigeon	<u>Rhipidurinae</u>	
<i>Tadorna ferruginea</i>	Brahniiny Shelduck	<i>Streptopelia chinensis</i>	Spotted Dove	<i>Rhipidura aureola</i>	White-browed Faintail-Flycatcher
<u>Accipitridae</u>		<i>Streptopelia decaocto</i>	Eurasian Collared-Dove	<u>Nectariniidae</u>	
<i>Accipiter badius</i>	Shikra	<i>Streptopelia senegalensis</i>	Little Brown Dove	<i>Nectarinia asiatica</i>	Purple Sunbird
<i>Aquila heliaca</i>	Eastern Imperial Eagle	<i>Treron phoenicoptera</i>	Yellow-legged Green-Pigeon	<u>Estrildidae</u>	
<i>Butastur teesa</i>	White-eyed Buzzard	<u>Psittacidae</u>		<i>Lonchura malabarica</i>	White-throated Munia
<i>Circus acrogynus</i>	Western Marsh-Harrier	<i>Psittacula cyanocephala</i>	Plum-headed Parakeet	<u>Passerinae</u>	
<i>Circus pygargus</i>	Montagu's Harrier	<i>Psittacula krameri</i>	Rose-ringed Parakeet	<i>Passer domesticus</i>	House Sparrow
<i>Elanus eaculcus</i>	Black-shouldered Kite	<u>Cuculidae</u>		<i>Petronia xanthocollis</i>	Yellow-throated Sparrow
<i>Gyps bengalensis</i>	Indian White-backed Vulture	<i>Centropus sinensis</i>	Greater Coucal	<u>Sturnidae</u>	
<i>Gyps indicus</i>	Long-billed Vulture	<i>Eudynamis scolopacea</i>	Asian Koel	<i>Acridotheres ginginianus</i>	Bank Myna
<i>Gyps fulvus</i>	Eurasian Griffon	<u>Strigidae</u>		<i>Acridotheres tristis</i>	Common Myna
<i>Gyps tenuirostris</i>	Slender-billed Vulture	<i>Athene brama</i>	Spotted Owllet	<i>Sturnus contra</i>	Asian Pied Starling
<i>Milvus migrans</i>	Black Kite	<u>Caprimulgidae</u>		<u>Oriolidae</u>	
<i>Neophron percnopterus</i>	Egyptian Vulture	<i>Apus affinis</i>	House Swift	<i>Oriolus oriolus</i>	Eurasian Golden Oriole
<i>Sarcogyps calvus</i>	Red-headed Vulture	<i>Caprimulgus asiaticus</i>	Common Indian Nightjar	<u>Dicruridae</u>	
<i>Spilornis cheela</i>	Crested Serpent-Eagle	<u>Alcedinidae</u>		<i>Dicrurus caerulescens</i>	White-bellied Drongo
<u>Pandionidae</u>		<i>Alcedo atthis</i>	Small Blue King-fisher	<i>Dicrurus macrocercus</i>	Black Drongo
<i>Pandion haliaetus</i>	Osprey	<i>Ceryle rudis</i>	Lesser Pied Kingfisher	<u>Corvidae</u>	
<u>Falconidae</u>		<i>Halcyon smyrnensis</i>	White-breasted Kingfisher	<i>Corvus macrorhynchos</i>	Jungle Crow
<i>Falco tinnunculus</i>	Common Kestrel	<u>Meropidae</u>		<i>Corvus splendens</i>	House Crow
<u>Phasianidae</u>		<i>Merops orientalis</i>	Small Bee-eater	<i>Dendrocitta vagabunda</i>	Indian Treepie
<i>Francolinus pondicerianus</i>	Grey Francolin	<i>Merops philippinus</i>	Blue-tailed Bee-cater		
<i>Pavo cristatus</i>	Indian Peafowl	<u>Coraciidae</u>			
<u>Turnicidae</u>		<i>Coracias benghalensis</i>	Indian Roller		
<i>Turnix suscitator</i>	Common Buttonquail	<u>Alaudidae</u>			
<i>Turnix tanki Blyth</i>	Yellow-legged Buttonquail	<i>Eremopterix grisea</i>	Ashy-crowned Sparrow-Lark		
<u>Gruidae</u>		<i>Mirafr cantillans</i>	Singing Bush-Lark		
<i>Grus antigone</i>	Sarus Crane				
<i>Grus grus</i>	Common Crane				
<u>Rallidae</u>					
<i>Amauromis phoenicurus</i>	White-breasted				

**Table 2. Reptiles and mammals of Gandhisagar Reservoir**

Scientific name	English name
<b>Reptiles</b>	
<i>Crocodylus palustris</i>	Mugger
<i>Geochelone elegans</i>	Indian Star Tortoise
<i>Kachuga tentoria</i>	Indian Tent Turtle
<i>Kachuga kachuga</i>	Red-crowned Roofed Turtle
<i>Aspideretus gangeticus</i>	Indian Softshell Turtle
<i>Lissemys punctata</i>	Indian Flapshell Turtle
<i>Hardella thurjii</i>	Crowned River Turtle
<i>Varanus bengalensis</i>	Goh
<b>Mammal</b>	
<i>Lutra perspicillata</i>	Smooth Indian Otter

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**Table 3. List of freshwater fishes of Gandhisagar Reservoir (Rao et al., 1998)**

Scientific name
<u>Cyprinidae</u>
<u>Subfamily: Cyprininae</u>
* <i>Catla catla</i>
** <i>Chela laubaca</i>
* <i>Cirrhinus mrigala</i>
* <i>Cirrhinus reba</i>
<i>Crossocheilus botia</i>
<i>Garra gotyla</i>
<i>Labeo bata</i>
<i>Labeo boggut</i>
* <i>Labeo calbasu</i>
* <i>Labeo gonius</i>
* <i>Labeo rohita</i>
<i>Osteobrama cotio</i>
<i>Oxygaster bacaila</i>
<i>Oxygaster clupeoides</i>
* <i>Puntius surana</i>
<i>Puntius ticto</i>
<u>Subfamily Rasborinae</u>
<i>Barilius barila</i>
<i>Barilius bengalensis</i>
<i>Barilius bota</i>
<i>Danio devamo</i>
* <i>Rasbora daniconius</i>
<u>Subfamily Schizothoracinae</u>
* <i>Tor tor</i>
<u>Subfamily Gobitidae</u>
<i>Nemachellus botia</i>
<u>Centropomidae</u>
<i>Ambassis nama</i>
<i>Ambassis ranga</i>
<u>Channidae</u>
<i>Channa marulius</i>
<i>Channa punctatus</i>
* <i>Channa striatus</i>
<u>Mugilidae</u>
* <i>Rhinomugil carsula</i>
<u>Mastacembelidae</u>
* <i>Mastacembalus armatus</i>
<u>Nanidae</u>
<i>Nandus nandus</i>
<u>Gobinae</u>
* <i>Glossogobius giuris</i>
<u>Belonidae</u>
* <i>Xenentodon cancila</i>
<u>Siluridae</u>
* <i>Ompok bimaculatus</i>
* <i>Wallago attu</i>
<u>Bagridae</u>
<i>Mystus aor</i>
* <i>Mystus seenghala</i>
<i>Rita rita</i>
<u>Sisoridae</u>
<i>Bagarius bagarius</i>
<u>Schielbeidae</u>
* <i>Eutropiethys bacha</i>
* <i>Silonia silondia</i>
<u>Notopteridae</u>
<i>Notopterus notopterus</i>

\*Seen during the recent survey; \*\* not reported earlier

**Table 4. List of Aquatic vegetation of Gandhisagar Reservoir**

Scientific name
<i>Ceratophyllum demersum</i>
<i>Chara</i> sp.
<i>Hydrilla verteolata</i>
<i>Najas graminea</i>
<i>Najas minor</i>
<i>Potamogeton crispus</i>
<i>Potamogeton pectinatus</i>
<i>Vallisneria spiralis</i>

**Table 5. Statistical details of Gandhisagar Dam and Reservoir**

Geographical location	24°44'N; 75°33'E
Construction commenced	1954
Completed	1960
Catchment	23,025km <sup>2</sup>
Av. rainfall	86.4CM
Minimum	35.6CM
Length of the dam	514m
Max. height	62.2m
Reservoir area at full capacity	660km <sup>2</sup>
Av. Area of the reservoir	402km <sup>2</sup>
Av. River bed	341.4m
Max. water level	399.8m
Max. length of reservoir	67.8km
Max. breadth of reservoir	26.1km
Max. Depth	33.4m
Av. Depth	58.4m
Total capacity of reservoir	8,440 Mio.m <sup>3</sup>
Electricity generation	30,000kw
Expected age	100yrs
Funds invested - Dam	Rs.16.6Cr
Electricity generation centre	Rs.4.79Cr

