



ECOTOURISM AND ITS PROSPECTS IN RAMOUA DAM, GWALIOR, MADHYA PRADESH

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Abstract

The present study was conducted on Ramoua dam to evaluate prospects of Eco-tourism. A well-recognized Water body situated at latitude 26⁰⁹'32.20'' North and longitude 78⁰¹³'24.91'' East and covers about 3177 hectares of dam. It is a about 6 km eastern side of Gwalior. Present investigation deals with the diversity of, the biotic communities present in the system with various management measures for optimizing its scenic beauty. The Ramoua dam has around 54 species of birds including 28 species of Aquatic bird which are often sighted in and around the dam. Also, the area nearby is enriched with amphibians, reptiles, and mammals such as various snakes, wild boar, lizards, Golden Langoor, pangolin, Asiatic Jackal, Chital, Blue bull, Rabbit. Sightings of these animals are quite often around the dam which might be attractive tourist spot, with the provisioning of conserving the wildlife. Thus, for betterment and ecotourism development in a suitable manner could be well developed. The locals and NGO or private organization should be asked to be the stakeholders for both sustainable ecotourism as well as livelihood of generations.

Keywords- Eco- tourism, Ramoua dam, Development, Diversity

Introduction:

In the era of increasing technology tourism has now a very big industry and its importance is increasing if the area is resourceful with natural beauty and historic evidence. The growth of ecotourism represents the change of tourist mindset with improved environmental awareness. Environmental firms largely support ecotourism because ecotourism is nature-based, sustainably managed conservation oriented (Abhinand, 2021). ("Ecotourism is a responsible travel to natural areas which conserves the environment and improves the well-being the local people" (Tripathi, 2016). Ecotourism is the management of tourism and conservation of nature in such a way to maintain a balance between requirement of the tourism and ecology

on the one hand and need of the local communities for jobs, new skills, income generating employment and a better status for locals (Tripathi and Jain, 2016).

In general it is observed that ecotourism assert that it conserves local cultures. But evidences show that establishment of conservation areas like sanctuaries, national parks and wildlife sanctuaries have illegally lost their homes and most commonly with no compensation. This brings peoples onto marginal lands with insufficient employment, lives stock and poverty. The local people may struggle for cultural survival while observed by tourists. The infrastructure development for excursion activities tourists likes lodges, homestays, hotels and parking grounds bring environmental degradation. In spite of the fact ecotourism is specifically designed to counter environmental degradation, it can sometimes be its cause. (Abhinand, 2016).

The estimation of local densities of wildlife helps to understand the abundance of various species of other organisms (Turner, 2003). One of the major priorities in conserving animals is monitoring their populations to find methods for their long-term survival (Caughley, 1982). So, it would be a responsible travel to such natural areas that safeguard the integrity of the ecosystem and produces economic benefits of local community and to encourage conservation (Kiper, 2012).

Dam has a diverse ecosystem that is related to aquatic organisms, birds, insects, and many other animals. Dam serves as the water distribution system for these animals and plants. Also, the landscape beauty and a comfortable ecology make Dam as bright prospects for tourist spot. Current biodiversity better known for birds and there are many other major groups of organisms and they probably inspire more extreme interest in humans, are often spectacular, relatively easily observed and not too difficult to identify. Various other animals like chital, nilgai, boar, and python are often sighted in the surrounding forest. Dam also has various fish species. Land surrounding the dam is mostly used of agriculture purpose by locals.

Therefore, it has been aimed to find out the biological diversity of this dam, which could be developed as tourism spot. The present study has been done to investigate the diversity of Wildlife in and around Dam.

STUDY AREA:

Ramoua Dam is situated in the Eastern side of Gwalior city of the state Madhya Pradesh, India located along the geological coordinates $78^{\circ} 10' 58.1916''$ E and $26^{\circ} 13' 5.8332''$ N near the Ramoua village. The area of this dam is about 3177 hectares. The dam is connected with Harshi reservoir through canal (prior to this the dam would dry up during summers and refill with water during rainy season). The dam is surrounded by hilly terrain. The forest cover surrounding the dam is semi dry deciduous forest having only herbs and shrubs. The land beyond forest cover and southern side of dam is used for agriculture purpose.

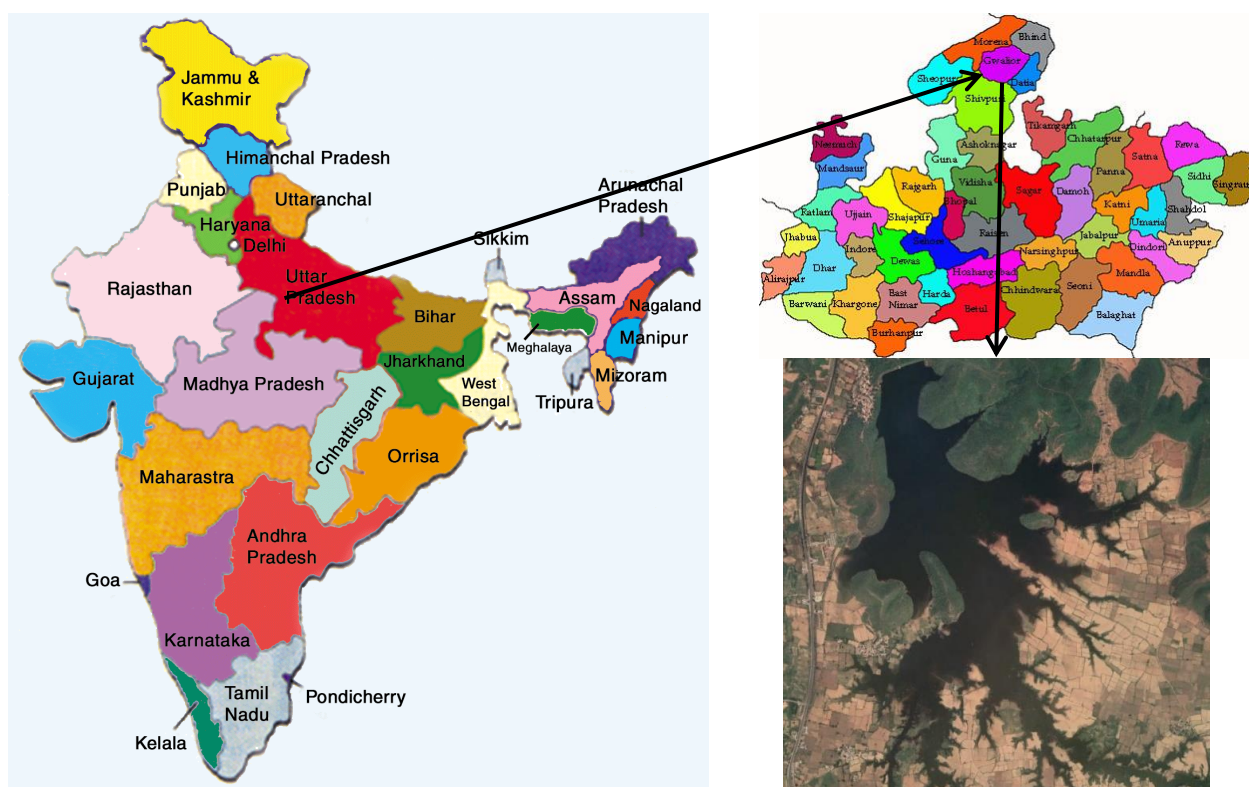


Fig1: Location map of Ramoua Dam, Gwalior

MATERIAL AND METHODS:

The samples were collected from two different sites of the Dam. Field visit were made to collect the water sample and observation of birds. Surface Water samples were taken for analysis. The atmospheric temperature and water temperature was recorded with the help of mercury filled centigrade thermometer. The specific conductivity was determined with the help of conductivity meter (DREL 2000 HACH, USA) and expressed as $\mu\text{mhos/cm}$. The hydrogen ion concentration was recorded with the help of pH strips and digital pH meter. Total Alkalinity was analysed by titration method using strong acid and methyl orange and phenolphthalein solutions as indicators. Total hardness of water was determined by ethylene diamine tetra acetic acid (EDTA) titration method using Erichromeblack-T as indicator and colour by visual estimation. Physico-chemical characters of water, temperature, colour, pH, Hardness and total alkalinity were determined at the sampling sites immediately after the collection of water samples, while rest of the parameters were analysed in the laboratory within a period of 6 hours after the collection of water samples. Samples were fixed for DO and BOD and then brought to the laboratory for analysis. Water samples were analysed for different parameters using standard methods (APHA, 1981, Trivedi and Goel, 1984)

The Avian fauna was identified with the help of Binoculars (Pentax 8x43 Z-series ZD ED) at different spots at every location and field guides such as a Pictorial Guide to the Birds of the Indian Subcontinent (Ali, 2006) and Water birds of Northern India (Alfred *et al.*, 2001), were used for identifying the birds. The birds were identified up to order level and a checklist was prepared using the IUCN database.

The reptiles and mammals are primarily identified with visual observation at different spots of the dam. In the secondary method, various animal tracks were observed at every location and were confirmed with the help of guide such as A Naturalist's guide to Reptiles of India (Das and Das 2017) and A

Naturalist's guide to the Mammals of India (Grewal and Chakravarty 2017). The reptiles and mammals were identified up to order level and a checklist was prepared using the IUCN database.

For identification of fishes, fishing nets were cast at different sites of the dam. The caught fish were then brought to the lab and identified with the help of guide such as Fishes of Uttar and Bihar (Srivastava 1980).

RESULT AND DISCUSSIONS:

(A) Distance of the Ramoua dam from National highway 44 Srinagar-Kanyakumari Highway

The ramoua dam spread in 3177 hectare and is attached to Morar River. Highway is running at mouth of the dam and dam is 500m from the highway connected by Dongarpur road. So dam is easily accessible for Bus or other vehicular transport communication.

(B) Surrounding of the Dam

The dam is surrounded by forest cover on its eastern side and southern part by agricultural land and Ramua village on western side. These provide dam a beautiful landscape from the northern part of dam.

(C) Ecology of the Dam

Four sampling sites of dam were decided to collected the water sample depicted as Site-1, Site-2, Site-3 and Site-4 with GPS location in Table 1.

Table 1: Different study sites with GPS Location at Ramoua Dam

S.No.	Samplingsite	GPSLocation
1	Site-1	26°9'32.20"N 78°13'24.91"E
2	Site-2	26°9'21.20"N 78°13'28.69"E
3	Site-3	26°9'5.82"N 78°13'25.06"E
4	Site-4	26°8'48.35"N 78°13'21.85"E

The physico-chemical properties of Ramoua Dam are summarized in Table 2.

(1) Odour, Taste & Colour:

Odourless water was found at all the sampling sites; taste of water samples was normal at all sites while at the site-1 and site-2 were muddy and at site-3 were yellow while no colour was at site4. The taste and odour suggest that water has low organic contents making the water tasteless and odourless. Also the water colour at site-1 and site-2 muddy due to high turbidity in water and at site-3 water was yellow which indicate dissolved organic matter. At site-4 water was clear indicating very low organic contents. Similar study was conducted on Chandolalake in Ahemdabad, Gujrat and they concluded similar results (Verma, Chandawat, Gupta and Solanki, 2012).

(2) Depth:

Depth of water was varying at different site between 82cm to 237 cm. The maximum depth was found at site 4 while minimum depth of water body at site 3. This suggest that the lake is shallow allowing for penetration of sunlight to the bottom allowing for photosynthesis which support submerged aquatic plants. Similar study was conducted on Ramgarh lake in Ghorakhpur, Uttar Pradesh and they concluded same result (Barnwal, Tripathi and Singhal, 2014).

(3) Water Temperature:

The water temperature levels on surface layers were found in the range 15.8 °C to 16.3 °C. The water temperature was found to be almost same at all the sampling sites in water body. The temperature is relatively stable which makes it suitable for supporting aquatic life and it also maintain optimum oxygen level in water. Similar study was conducted on Ramgarh lake in Ghorakhpur, Uttar Pradesh and they concluded same result (Barnwal, Tripathi and Singhal, 2014).

(4) Air Temperature:

The Air temperature levels were found to vary in the range 12.4 °C to 15.2 °C. The air temperature was recorded almost same at all the sites in study area. The air temperature appears to be the major factor affecting the water temperature of lake. Similar study was conducted on Ramgarh lake in Ghorakhpur, Uttar Pradesh and they concluded same result (Barnwal, Tripathi and Singhal, 2014).

(5) pH:

The pH values were recorded from 6.2 to 8.1. The minimum pH value was recorded at Site-1 while maximum value was recorded at site-3 unit indicating that at site 3 the water was alkaline while other sites were neutral. This is suitable to sustain many aquatic and other life forms. The slightly alkaline pH also suggests the presence of mineral content in lake. Similar study was conducted on Chandola lake in Ahmedabad, Gujrat and they concluded similar results (Verma, Chandawat, Gupta and Solanki, 2012).

(6) Hardness:

The hardness was found to be medium, ranging from 502 mg/Lit to 639 mg/Lit. Highest hardness of 624 mg/Lit. was observed in same. This indicate the presence of mineral compound in the lake. Generally, the harder the water, the lower the toxicity of other metals to aquatic life. In hard water some of the metal ions form insoluble precipitates and drop out of solution and are not available to be taken in by the organism. Higher hardness is suitable for aquatic life. Similar study was conducted on Ramgarh lake in Ghorakhpur, Uttar Pradesh and they concluded same result (Barnwal, Tripathi and Singhal, 2014).

(7) Electrical Conductivity:

The EC in the Ramaua Dam varies in the range of 732 to 912 $\mu\text{mho/cm}$. The minimum EC was 732 $\mu\text{mho/cm}$ Observed at site-4 while the maximum EC was 912 $\mu\text{mho/cm}$ observed at site-1. The possible

reasons for these high EC values may be the input of large amounts of surface runoff containing sediments from the catchment areas, which have intensive agriculture crops and human habitation near these stations. Similar study was conducted on Chandola lake in Ahmedabad, Gujarat and they concluded similar results (Verma, Chandawat, Gupta and Solanki, 2012).

(8) Dissolve Oxygen

The O₂ were recorded between 16 mg/Lit to 18 mg/Lit with minimum and highest. The most important parameters of water directly affected the presence of biota of the water body. The dissolved oxygen level is suitable for aquatic life but also make it susceptible for algal blooms. Similar study was conducted on Chandola lake in Ahmedabad, Gujarat and they concluded similar results (Verma, Chandawat, Gupta and Solanki, 2012).

Table 2: Physio-chemical parameters of Ramoua Dam during December, 2022

S.No.	Parameters	Unit	Site-1	Site-2	Site-3	Site-4
1	Odour	-	Fishsmell	Fishsmell	No	No
2	Taste	-	Normal	Normal	Normal	Normal
3	Colour	-	Muddy	Muddy	Yellow	No colour
4	Depth	Cm	112	130	82	237
5	Water Temperature	°C	16.7	15.8	16.7	16.3
6	Air Temperature	°C	12.4	14.5	15.2	12.7
7	pH	-	6.8	7.2	7.9	8.1
8	COD	mg/Lit	43.4	40.2	37	33.2
9	DO	mg/Lit	16.3	17.5	16.9	19
10	Hardness	PPM	639	558	518	502
11	Conductivity	µmho/cm	916	898	865	740

79 species of wetlands birds belonging to 20 orders and 44 families were recorded from the sites of Ramaua Dam december 2022 . The check list of recorded bird species along with heir order, family, scientific name, occurrence status and residential status is given in Table 3.

Table 3: Checklist of Avian fauna recorded from the study area during the study period 2022

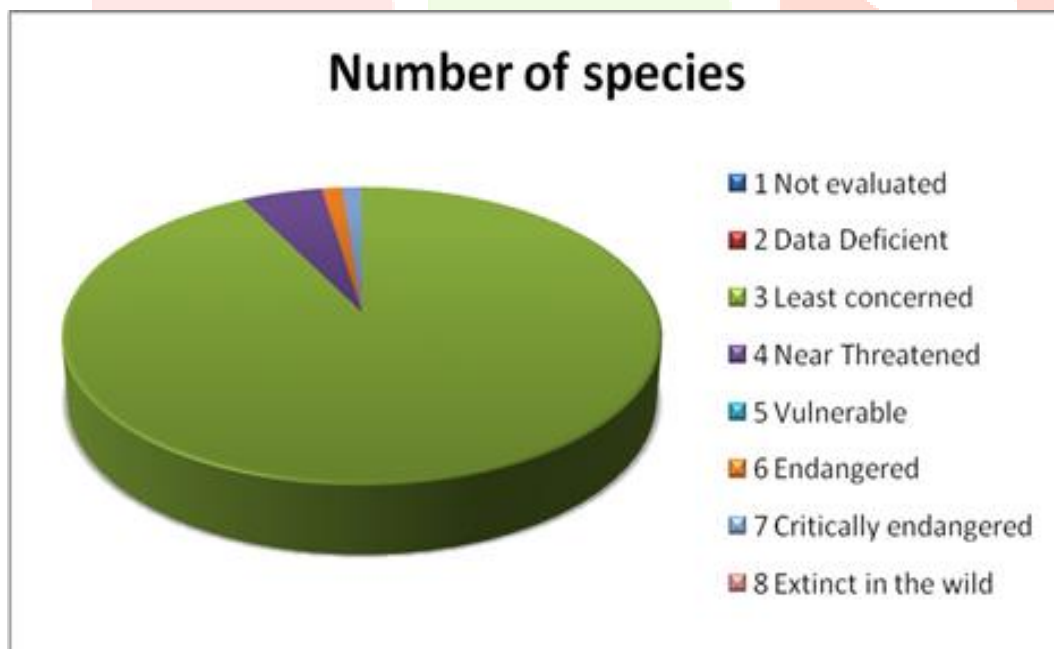
S.No	Order	Family	Scientific name	Common name	IUCN	RS
1	Passeriformes	Dicruridae	Dicrurus macrocercus	Black drongo	LC	M
2	Passeriformes	Leiothrichidae	Argya striata	Jungle babbler	LC	R
3	Passeriformes	Leiothrichidae	Argya malcolmi	Large grey Babbler	LC	R
4	Passeriformes	Muscicapidae	Copsychus saularis	Oriental Magpie-Robin	LC	R
5	Passeriformes	Muscicapidae	Copsychus fulicatus	Indian robin	LC	R
6	Passeriformes	Monarchidae	Terpsiphone paradisi	Indian paradise-flycatcher	LC	RM
7	Passeriformes	Motacillidae	Motacilla alba	White wagtail	LC	R
8	Passeriformes	Motacillidae	Motacilla cinerea	Grey wagtail	LC	RM
9	Passeriformes	Sturnidae	Acridotheres tristis	Common myna	LC	RM
10	Passeriformes	Sturnidae	Sturnia pagodarum	Brahminy starling	LC	R
11	Passeriformes	Oriolidae	Oriolus chinensis	Black-naped oriole	LC	M
12	Passeriformes	Nectariniidae	Cinnyris asiaticus	Purple sunbird	LC	R
13	Passeriformes	Corvidae	Dendrocitta vagabunda	Rufous treepie	LC	RM
14	Passeriformes	Corvidae	Corvus splendens	House crow	LC	R
15	Passeriformes	Corvidae	Corvus macrohynchos	Large-billed crow	LC	R
16	Passeriformes	Aegithinidae	Aegithina tiphia	Common lora	LC	RM
17	Passeriformes	Alaudiae	Mirafra erythroptera	Indian bushlark	LC	M
18	Passeriformes	Cisticolidae	Prinia socialis	Ashy prinia	LC	RM
19	Passeriformes	Cisticolidae	Prinia inornata	Plain prinia	LC	RM
20	Passeriformes	Ploceidae	Ploceus philippinus	Baya weaver	LC	RM
21	Passeriformes	Pycnonotidae	Pycnonotus cafer	Red-vented bulbul	LC	R
22	Passeriformes	Zosteropidae	Zosterops palpebrosus	Indian white eye	LC	RM
23	Passeriformes	Estrildidae	Lonchura malacca	Tri-colored munia	LC	M

	es					
2	Passeriformes	Pittidae	Pitta brachyura	Indian pitta	LC	M
2	Galliformes	Phasianidae	Pavo cristatus	Indian peafowl	LC	R
2	Galliformes	Phasianidae	Perdica asiatica	Jungle bush quail	NT	R
2	Galliformes	Phasianidae	Ortygornis pondicerianus	Grey francolin	LC	R
2	Coraciiformes	Alcedinidae	Halcyon smyrnenis	White-throated kingfisher	LC	R
2	Coraciiformes	Meropidae	Merops orientalis	Asian green bee-eater	LC	M
3	Coraciiformes	Meropidae	Meropus philippinus	Blue tailed bee-eater	LC	M
3	Coraciiformes	Coraciidae	Coracias benghalensis	Indian roller	LC	R
3	Accipitriformes	Accipitridae	Gyps fulvus	Eurasian griffon	LC	RM
3	Accipitriformes	Accipitridae	Elanus caeruleus	Black-winged kite	LC	RM
3	Pelecaniformes	Ardeidae	Ardea alba	Great egret	LC	M
3	Pelecaniformes	Ardeidae	Ardea cinerea	Grey heron	LC	M
3	Pelecaniformes	Ardeidae	Ardea purpurea	Purple heron	LC	M
3	Pelecaniformes	Ardeidae	Ardea intermedia	Intermediate egret	LC	M
3	Pelecaniformes	Ardeidae	Bubulcus ibis	Cattle egret	LC	M
3	Pelecaniformes	Ardeidae	Ardeola grayii	Indian pond heron	LC	R
4	Psittaciformes	Psittaculidae	Psittacula krameri	Rose ringed parakeet	LC	R
4	Cuculiformes	Cuculidae	Eudynamis scolopacea	Asian koel	LC	RM
4	Cuculiformes	Cuculidae	Hierococcyx varius	Common hawk-cuckoo	LC	M
4	Cuculiformes	Cuculidae	Cuculus micropterus	Indian cuckoo	LC	R
4	Cuculiformes	Cuculidae	Centropus sinensis	Greater coucal	LC	RM
4	Charadriiformes	Charadriidae	Vanellus indicus	Red wattled lapwing	LC	R
4	Charadriiformes	Charadriidae	Vanellus malabaricus	Yellow wattled lapwing	LC	R
4	Charadriiformes	Charadriidae	Charadrius hiaticula	Common Ringed Plover	LC	M
4	Charadriiformes	Charadriidae	Charadrius dubius	Little Ringed Plover	LC	M
4	Charadriiformes	Burhinidae	Burhinus indicus	Indian thick knee	LC	RM
5	Charadriiformes	Scolopacidae	Actitis hypoleucos	Common Sandpiper	LC	M
5	Charadriiformes	Scolopacidae	Tringa glareola	Wood sandpiper	LC	M

5	Charadriiformes	Scolopacidae	Calidris minuta	Little Stint	LC	M
5	Anseriformes	Anatidae	Dendrocygna javanica	Lesser whistling duck	LC	M
5	Anseriformes	Anatidae	Anas acuta	Northern pintail	LC	M
5	Anseriformes	Anatidae	Sarkidiornis melanotos	Knob bill duck	LC	R
5	Anseriformes	Anatidae	Tadorna ferruginea	Ruddy shelduck	LC	M
5	Piciformes	Picidae	Dinopium benghalense	Black rumped flameback	LC	RM
5	Piciformes	Megalaimidae	Psilopogon zeylanicus	Brown-headed barbet	LC	RM
5	Piciformes	Megalaimidae	Psilopogon haemacephalus	Coppersmith barbet	LC	RM
6	Bucerotiformes	Bucerotidae	Ocyrceros bistrotris	India grey hornbill	LC	M
6	Bucerotiformes	Upupidae	Upupa epops	Eurasian hoopoe	LC	RM
6	Columbiformes	Columbidae	Treron phonicopterus	Yellow-footed green pigeon	LC	R
6	Columbiformes	Columbidae	Columba livia	Indian Rock dove	LC	R
6	Columbiformes	Columbidae	Spilopelia chinensis	Spotted dove	LC	R
6	Columbiformes	Columbidae	Streptopelia decaocta	Collared dove	LC	R
6	Columbiformes	Columbidae	Spilopelia senegalensis	Laughing dove	LC	R
6	Columbiformes	Columbidae	Streptopelia tranquebarcia	Red turtle dove	LC	R
6	Accipitriformes	Accipitridae	Gyps indicus	Indian vulture	CE	R
6	Accipitriformes	Accipitridae	Accipiter badius	Shikra	LC	R
7	Accipitriformes	Accipitridae	Neophron percnopterus	Egyption vulture	E	M
7	Strigiformes	Strigidae	Athene brama	Spotted owlet	NT	R
7	Gruiformes	Rallidae	Gallinula chloropus	Common moorhen	LC	R
7	Gruiformes	Rallidae	Amaurornis phoenicurus	White breasted waterhen	LC	R
7	Gruiformes	Rallidae	Fulica atra	Common Coot	LC	RM
7	Gruiformes	Rallidae	Porphyrio porphyrio	Purple moorhen	LC	M
7	Ciconiiformes	Ciconiidae	Ciconia episcopus	Asian woolynecked stork	NT	M
7	Ciconiiformes	Ciconiidae	Anastomus oscitans	Asian openbill	LC	M
7	Suliformes	Phalacrocoracidae	Microcarbo niger	Little cormorant	LC	M
7	Suliformes	Phalacrocoracidae	Phalacrocorax carbo	Great cormorant	LC	M

Table 4: Number of species under various IUCN Status

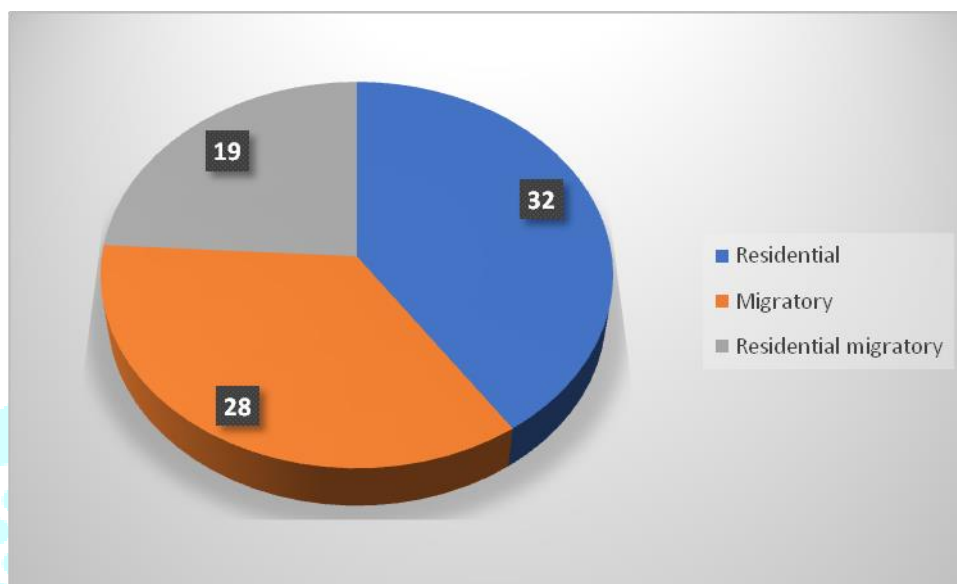
S.No.	IUCN Status	Number of species
1	Not evaluated	0
2	Data Deficient	0
3	Least concerned	73
4	Near Threatened	4
5	Vulnerable	0
6	Endangered	1
7	Critically endangered	1
8	Extinct in the wild	0
9	Extinct	0

**Fig.2: IUCN status of bird species.**

73 species of birds were least concerned (Table 4). These species were dominant in the ecosystem. Four species was near threatened. These species were rare sight around the dam. One species was endangered which was Egyptian vulture. And one species was critically endangered which was Indian vulture. The species are shown with diagrammatic pie-chart representation in fig. 2.

Table 5: Number of birds under the various migratory status.

S. No.	Migratory status	Number of species
1.	Residential	32
2.	Migratory	28
3.	Residential migratory	19

**Fig.3: Residential status of bird species**

Out of 79 species of birds 32 species were residential. These species can be seen throughout the year. 28 species were migratory. These species can only be seen at particular time of year. 19 species were residential migratory. These birds are more often sighted than the migratory birds. The species are shown in table 5 and diagrammatic pie-chart representation in fig.3.

Table 6: Number of birds under the various orders.

S. No.	Orders	Number of birds
1.	Passeriformes	24
2.	Galliformes	3
3.	Coraciiformes	4
4.	Accipitriformes	2
5.	Perlecaniformes	6
6.	Psittaciformes	1
7.	Cuculiformes	4
8.	Charadiiformes	8
9.	Anseriformes	4
10.	Piciformes	3

11.	Bucerotiformes	2
12.	Columbiformes	6
13.	Accipitritriformes	3
14.	Strigiformes	1
15.	Gruciformes	4
16.	Ciconiiformes	2
17.	Suliformes	2

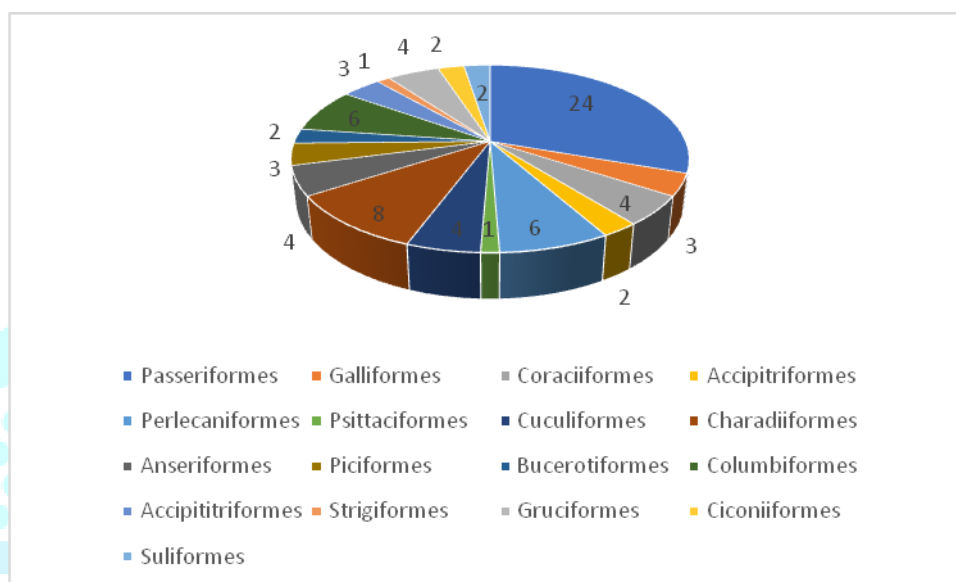


Fig. 3: Number of birds under various orders.

79 species of birds were classified under 17 orders. Most bird species belong to Passeriformes family followed by Charadiiformes. Least birds belong to family Psittaciformes. Birds from family Passeriformes were most abundant and dominant. Birds from Psittaciformes family were rare sight. This is shown in table 6 and in diagrammatic pie-chart representation in fig.3.

Table 7: Number of birds under various families.

S. No.	Families	Number of Families
1.	Dicruridae	1
2.	Leiothrichidae	2
3.	Muscicapidae	2
4.	Monarchidae	1
5.	Motacillidae	2
6.	Sturnidae	2

7.	Oriolidae	1
8.	Nectariniidae	1
9.	Corvidae	3
10.	Aegithinidae	1
11.	Alaudiae	1
12.	Cisticolidae	2
13.	Ploceidae	1
14.	Pycnontidae	1
15.	Zosteropidae	1
16.	Estrildidae	1
17.	Pittadae	1
18.	Phasianidae	3
19.	Alcedinidae	1
20.	Meropidae	2
21.	Coraciidae	1
22.	Accipitridae	2
23.	Ardeidae	6
24.	Psittaculidae	1
25.	Cuculidae	4
26.	Charadriidae	4
27.	Burhinidae	1
28.	Scolopacidae	3
29.	Anatidae	4
30.	Picidae	1
31.	Megalaimidae	2
32.	Bucerotidae	1
33.	Upupidae	1
34.	Columbidae	6
35.	Accipitridae	3
36.	Strigidae	1
37.	Rallidae	4
38.	Ciconiidae	1
39.	Ioniidae	1
40.	Phalacrocoracidae	2

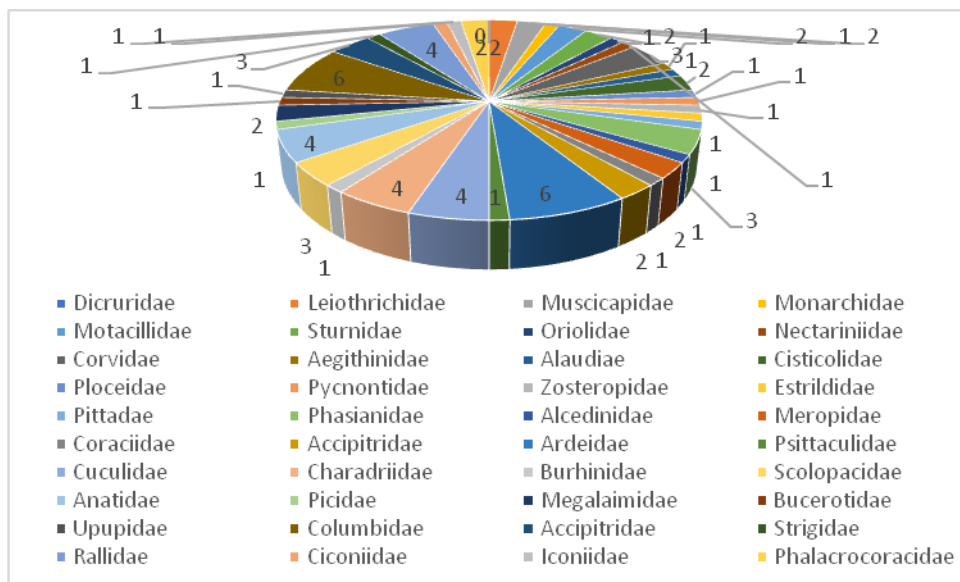


Fig. 4: Number of birds under various families

79 species of birds were classified under 40 families shown in table 7 and diagrammatic pie-chart representation in fig. 4.

14 species of mammals belonging to 6 orders and 10 families were recorded from the sites of Ramaua Dam december 2022. The check list of recorded mammals species along with heir order, family, scientific name, and IUCN status is given in Table 4.

Table 8: Checklist of Mammals recorded from study area during study period 2022.

S.No.	Order	Family	Scientific name	Common name	IUCN status
1	Carnivora	Canidae	Canis aureus indicus	Indian jackal	LC
2	Carnivora	Canidae	Canis lupus familiaris	Domestic dog	LC
3	Carnivora	Felidae	Pantherapardus	Leopard	V
4	Carnivora	Felidae	Feliscatus	Domestic cat	LC
5	Carnivora	Herpestida	Urvasmithii	Ruddy mongoose	LC
6	Artiodactyla	Suidae	Sus scrofacristatus	Wild boar	LC
7	Artiodactyla	Cervidae	Axis axis	Chital	LC
8	Artiodactyla	Bovidae	Boselaphustragocamelus	Blue bull	LC
9	Artiodactyla	Bovidae	Tetracerusquadricornis	Four-horned antelope	V

10	Lagomorpha	Leporidae	Lepus nigricollis	Indian hare	LC
11	Chiroptera	Rhinopomatidae	Rhinopomahardwickii	Lesser mouse-tailed bat	LC
12	Rodentia	Sciuridae	Funambulupennantii	Five-stripped palm squirrel	LC
13	Primates	Cercopithecidae	MacacaMulatta	Rhesus macaque	LC
14	Primates	Cercopithecidae	Simia entellus	Hanuman langur	LC

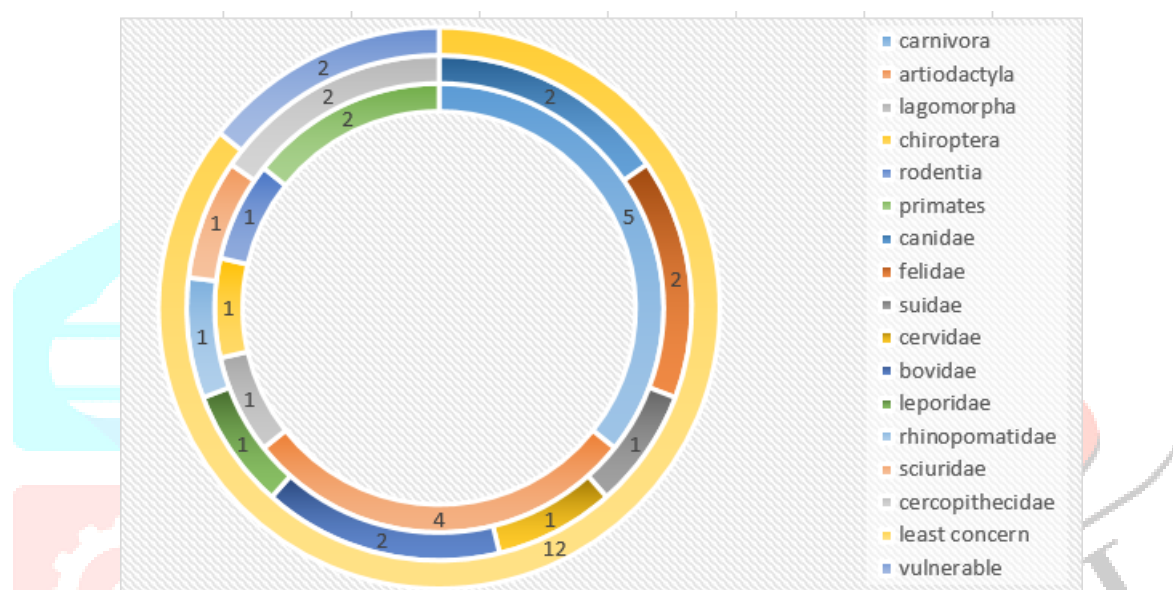


Fig. 5: Number of mammals under various orders (innermost), families (middle) and IUCN status (outermost).

14 species of mammals were identified and classified under 6 orders that are shown in innermost tier, 10 families shown in middle tier and their IUCN status in the outermost tier shown in diagrammatic pie-chart representation in fig. 5. The species identified include large carnivore (leopard, Indian jackal etc.), large herbivores (blue bull, chital etc.), rodents (palm squirrel) and primates (rhesus macaque) as shown in table 8.

7 species of reptiles belonging to 2 orders and 6 families were recorded from the sites of Ramaua Dam december 2022 . The check list of recorded reptiles species along with heir order, family, scientific name, and IUCN is given in Table 9.

Table 9: Checklist of Reptiles recorded from study area during study period 2022.

S.No.	Order	Family	Scientific name	Common name	IUCN Status
1	Squamata	Scincidae	Riopapunctata	Common dotted garden skink	LC
2	Squamata	Elapidae	Bungaruscaeruleus	Common krait	ND
3	Squamata	Elapidae	Najanaja	Indian spectacled cobra	LC
4	Squamata	Pythonidae	Python molurus	Indian rock python	NT
5	Squamata	Viperidae	Daboiarusselii	Russell's viper	LC
6	Squamata	Colubridae	Ptyas mucosa	Rat snake	LC
7	Testudines	Trionychidae	Nilssoniagangetica	Soft shell turtle	En

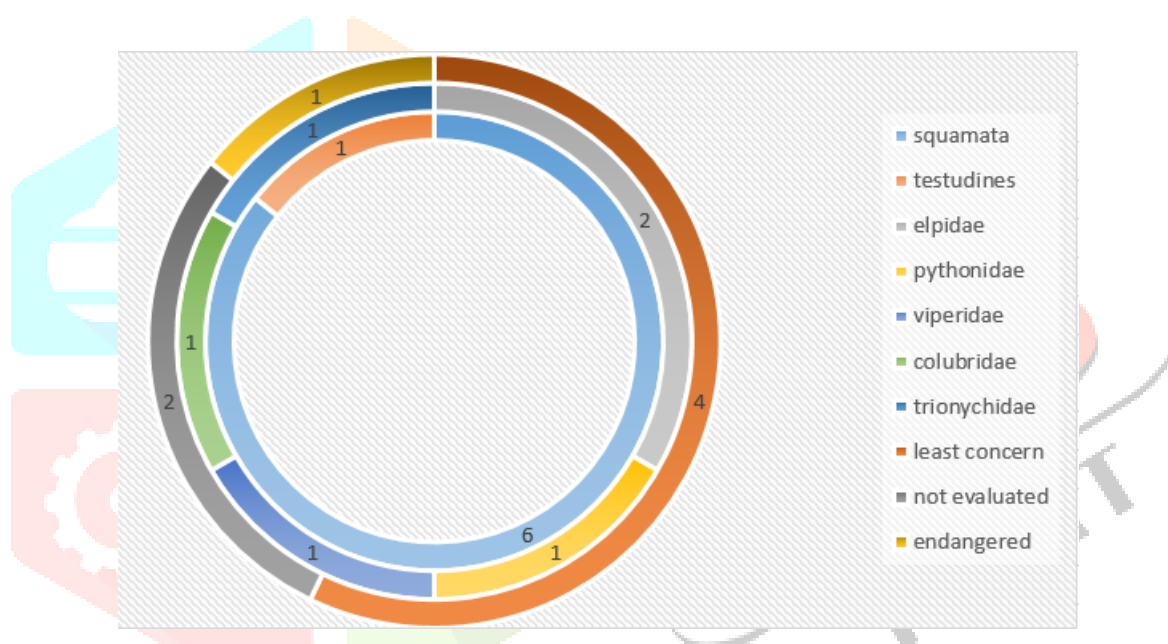


Fig. 6: Numbers of reptiles under various orders (innermost), families (middle) and IUCN status (outermost).

7 species of reptiles were identified and classified under 2 orders shown in innermost tier, 5 families shown in middle tier and their IUCN status in outermost tier of diagrammatic pie-chart representation in fig. 6. The checklist of species is shown in table 8.

5 species of fish belonging to 2 orders and 2 families were recorded from the sites of Ramaua Dam in December 2022. The checklist of recorded fish species along with their order, family, and scientific name is given in Table 10.

Table 10: Checklist of fishes recorded from the study area during the study period 2022.

S.No.	Order	Family	Scientific name	Common name	IUCN Status	CAMP status
1	Osteoglossiformes	Notopteridae	Notopterus Notopterus	Bronze featherback	LC	LRnt
2	Cypriniformes	Cyprinidae	Catlacatla	Major south Asian carp	NE	V
3	Cypriniformes	Cyprinidae	Cirrhinusmrigala	White carp	LC	LRnt
4	Cypriniformes	Cyprinidae	Cirrhinusreba	Reba carp	NE	V
5	Cypriniformes	Cyprinidae	Cyprinuscarpio	Eurasian carp	V	NE

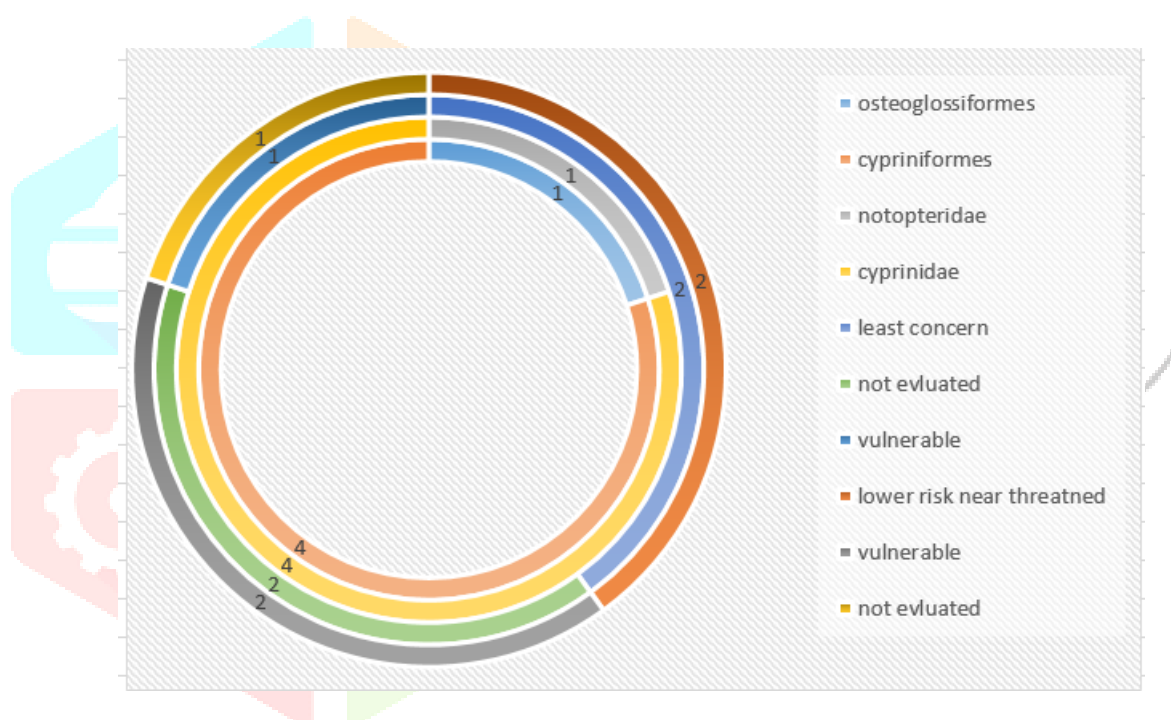


Fig. 7: Numbers of fishes under various orders (innermost), families (second) and IUCN status (third) and CAMP status (outermost).

5 species of fisher were identified and classified under 2 orders shown in innermost tier, 2 families shown in second tier, their IUCN status in third tier and CAMP status in outermost tier of diagrammatic pie-chart representation in fig. 7. The checklist is shown in table 10.

(D) Role of government in developing Ramoua dam as Eco-tourism spot:

In recent years government as shown interest in developing dam as eco-tourism spot like Tighra dam. In upcoming years government will invest in various activities like boating, picnic spots, and other environmental awareness programmes. The government will also use dam as water reservoir for supplying the water through the city to meet water demand. However, the government should be cautious about bringing human interaction to natural habitats otherwise it will end getting polluted beyond control.

CONCLUSION:

This study concludes that the dam has great potential for being developed as an ecotourism spot. The dam has a very rich biodiversity of aves, fishes, mammals, and other animals. The dam provides a great medium for birds and other animals for feeding and nesting purposes. Birds surveyed acknowledge that this water body is a paradise for the birds. It is useful for birds for habitat. Fluctuations in water quality may affect the health of residents and migratory birds. Human interaction was the measure of concern and menace for the near future because activity increases in the storage area. Hence a habitat with open water with submerged vegetation is the most suitable habitat that should be mapped in Ramoua Dam and attempts should be made to keep them free from human interference. The surrounding forest cover attracts a lot of different species of animals. The above observation indicates that wetland support at least 79 species of birds. Various aquatic birds can be seen around the dam and many migratory birds are sighted in different seasons. The dam has various fish species which form an important part of the dam ecosystem. The surrounding forest has various species. Many mammals like chital, blue bull, and boar are often sighted in the forest. Many snake species are also present in the forest. Snakes like the Indian rock python, and Indian cobra, are often seen in the area. The dam is suitable for various ecotourism activities and various awareness and study purposes. The dam will benefit from these awareness activities. People will understand the importance of such a habitat and its role in the ecosystem.

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