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ENVIS *Newsletter*

on wetland ecosystems and inland wetlands

Sarovar Saurabh

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Nelapattu Bird Sanctuary Photograph courtesy Mr. M. Bulresh Guptha

Sálim Ali Centre for Ornithology and Natural History (SACON)
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Instructions to Contributors

We welcome original research and popular articles, reviews, reports, research highlights, notes, news, snippets, etc., related to the thematic area of the ENVIS centre for publication in '*Sarovar Saurabh the ENVIS Newsletter on Wetland ecosystems and inland wetlands*'.

The articles and other information should be neatly typed in double space not exceeding five pages. The figures / graphs / drawings should be of good quality and clarity. Photographs should be of minimum 300 dpi resolution. References should be limited and cited in the text by name and year. Council of Science editors style may be referred to for listing references at the end.

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From the Editors desk.....

Wetlands form an important resource for humans and its conservation is essential in maintaining the environmental security of any country including its water security. From time immemorial wetlands have played very critical role in fostering many cultures and civilization. India with its myriad legacy of natural resources is also rich in aquatic resources, and it has been persistently working towards implementing various conservation measures and to fulfill its international commitments.

In this newsletter we have featured the United Nations urge for action during the international decade of water i.e. 2005 – 2015. As we move ahead closer towards the end of the decade of water, the citizens of our country need to ensure that their support turns into actions. This newsletter, the first of 2012, also brings to you articles / views on the wetland habitats of industrial origin like flyash ponds, on rapid surveys, and on rainfall and wetlands. In the News article the world wetlands day celebrations by the MoEF at the National level and SACON's efforts in Coimbatore are highlighted.

We at SACON take the privilege of informing that the Ministry of Environment and Forests, Government of India have nominated SACON as the NGO CEPA Focal Point for the country for the Ramsar Convention. We look forward to inputs, assistance and interactions from all working on wetlands in presenting the issues related to these ecosystems, conservation actions and the like at the global level.

At SACON, the ENVIS team looks forward to your involvement in reaching out through this Newsletter to the public and to disseminate widely information on ecology and conservation of this invaluable natural heritage. We also look forward to news and articles on your works and activities related to wetlands.

P.A. Azeez.

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An International Decade For Action
Water for Life Decade (2005-2015)

Source: www.un.org/waterforlifedecade

The "Water for Life" Decade aims to promote efforts to fulfill international commitments made on water and water-related issues by 2015, placing special emphasis on the involvement of women in these efforts.

WHY a 'Water for Life' Decade?

Water is essential for life. No living being on planet Earth can survive without it. It is a prerequisite for human health and well-being as well as for the preservation of the environment. However, four of every ten people in the world do not have access to even a simple pit latrine; and nearly two in ten have no source of safe drinking water. Every year millions of people, most of them children, die from diseases associated with inadequate water supply, sanitation, and hygiene. According to the World Health Organization, each and every day some 3,900 children die because of dirty water or poor hygiene; diseases transmitted through water or human excrement are the second-leading cause of death among children worldwide, after respiratory diseases. Water scarcity, poor water quality, and inadequate sanitation negatively impact food security, livelihood choices, and educational opportunities for poor families across the world. Water-related natural disasters such as floods, tropical storms and tsunamis exact a heavy toll in human life and suffering. And all too regularly, drought afflicts some of the world's poorest countries, exacerbating hunger and malnutrition.

Beyond meeting basic human needs, water supply and sanitation services, as well as water as a resource, are critical to sustainable development. It is a major source of energy in some parts of the world, while in others its potential as an energy source remains largely untapped. Water is also necessary for agriculture and for many industrial processes. And in more than a few countries, it makes up an integral part of transport systems. With improved scientific understanding, the international community has also come to appreciate more fully the valuable services provided by water-related ecosystems, from flood control to storm protection and water purification.

Water challenges will increase significantly in the coming years. Continuing population growth and rising incomes will lead to greater water consumption, as well as more waste. The urban population in developing countries will grow dramatically, generating demand well beyond the capacity of already inadequate water supply and sanitation infrastructure and services. According to the UN World Water Development Report, by 2050, at least one in four people is likely to live in a country affected by chronic or recurring shortages of freshwater.

It seems there are more than few reasons to put water and sanitation at the top of the world's agenda...

WHEN did the International Decade for Action 'Water for Life' 2005-2015 started?

The world is waking up to the water and sanitation crisis. At the United Nations Millennium Summit in September 2000, the largest-ever gathering of world leaders adopted the Millennium Declaration; from the Declaration emerged the Millennium Development Goals, an integrated set of time-bound targets for extending the benefits of globalization to the world's poorest citizens. Among them was target 10, to cut in half the proportion of people without sustainable access to safe drinking water. At the Johannesburg World Summit for Sustainable Development, in 2002, this target was expanded to include basic sanitation, and water as a resource was recognized as a critical factor for meeting all the Goals. This sanitation objective is now an integral part of target 10.

Since Johannesburg, further international deliberations on water and sanitation have helped advance cooperation and action in this area. Significant progress has been made since then in providing people with access to clean drinking water and basic sanitation. But a major effort is still required to extend these essential services to those still unserved, the vast majority of whom are poor people.

Given the magnitude of the task, in December 2003, the United Nations General Assembly, in resolution A/RES/58/217 , proclaimed the period 2005-2015 International Decade for Action 'Water for Life'. The decade officially started on World Water Day, March 22, 2005.

WHAT is the International Decade for Action 'Water for Life' 2005-2015?

The primary goal of the 'Water for Life' Decade is to promote efforts to fulfill international commitments made on water and water-related issues by 2015. Focus is on furthering cooperation at all levels, so that the water-related goals of the Millennium Declaration, the Johannesburg Plan of Implementation of the World Summit for Sustainable Development, and Agenda 21 can be achieved.

The challenge of the Decade is to focus attention on action-oriented activities and policies that ensure the long-term sustainable management of water resources, in terms of both quantity and quality, and include measures to improve sanitation. Achieving the goals of the 'Water for Life' Decade requires sustained commitment, cooperation and investment on the part of all stakeholders from 2005 to 2015 and far beyond.

WHERE does the 'Water for Life' Decade take place?

It is vital to make 2005 and leading up to 2015 remarkable years in ensuring that everyone is aware of the urgency of the goals to be achieved. Every event and every voice on every occasion are vital in ensuring new energy and commitment to turning the tide on a situation we can no longer abide.

The 'Water for Life' Decade provides an opportunity to everyone to get involved. The Decade takes place everywhere around the world. Your ideas and initiatives, as an individual or organization, are always welcomed. Whatever kind of events you decide to organize, we hope this will help you leverage the maximum impact, however modest your budget. All efforts will contribute to making the 'Water for Life' Decade a landmark event!

WHO is responsible for the 'Water for Life' Decade?

The United Nations, through its inter-agency coordination mechanism, UN-Water, is responsible for coordinating the 'Water for Life' Decade.

UN-Water is the inter-agency mechanism for the implementation of the Johannesburg Plan of Implementation water-related provisions and the Millennium Development Goals concerning freshwater. The terms of reference and modalities of work of UN-Water cover the elements of a detailed inter-agency plan for addressing water as well as sanitation issues, and include mechanisms for interacting with non-United Nations system stakeholders.

Two initiatives have been launched by UN-Water to support the 'Water for Life' Decade:

- The UN-Water Decade Programme for Capacity Development (UNW-DPC). Hosted by the United Nations University in Bonn, Germany, the UNW-DPC strengthens the coherence and effectiveness of capacity development activities in the framework of the Decade.
- The United Nations Office to Support the International Decade for Action 'Water for Life' 2005-2015/UN-Water Decade Programme on Advocacy and Communication (UNO-IDfA/UNW-DPAC). Located in Zaragoza, Spain, and led by the United Nations Department of Economic and Social Affairs (UNDESA), UNO-IDfA/UNW-DPC facilitates information, implements communication and raises awareness in the framework of the Decade.

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Birds from Ashes: Birdlife at Flyash Ponds of NTPS, Nashik, Maharashtra, India

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Abstract

Flyash is a waste product generated from coal based thermal power plants. Globally, disposal of fly ash is a great challenge for the planners. Dumping the ash in nearby wastelands is most preferred disposal method adopted by the agencies. In India, such depositions are often transformed in to varying sizes of ponds that are known as fly ash ponds. Out of the 8 major thermal power plants of Maharashtra, fly ash ponds associated with Nashik Thermal Power Station were explored as habitats for the faunal diversity. Despite the toxic nature of flyash, these sites harbour significant avian diversity (128 species). Interestingly, these ponds are situated in close proximity with Nandur-Madhyameshwar Bird Sanctuary along the Nandur-Madhyameshwar dam. This in fact encouraged a comparative study of avian diversity of both these man-made wetlands. The analysis based on field observations made during 2007-2011, shows high similarity value (0.75) between these habitats. Present study signifies the association of avifauna with these industrial habitats that can be converted into eco parks.

Keywords: Flyash, Thermal Power Station, Foraging ground, Eco-park, Migration

Introduction:

Every activity of human development demands huge amount of energy in some or the other form. In the traditional methods that cater this need of our country, coal fired thermal power stations, till date, occupies topmost position. Flyash (FA) is a waste product generated out of such coal based power generation process. Around 68% of power generation in Maharashtra is through coal based power plants of Chandrapur, Nashik, Koradi, Khaparkheda, Paras, Parali-vaijanath, Bhusaval, Dahanu and TATA (Dhadase *et al.*, 2008). Flyash, basically comprises of various silicates (SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO) and traces of heavy elements (Hg, I, Cd, Ga, Sb, Se, Ti, V, As, Cr, La, Mo, Ni, Pb, Th, U, Zn, B, Ba, Cu, Mn, Sr) (Amuthasheel and Manoharan 2003, Murthy and Ambalavana 2003, Naik 2006, Donaldson and Born 1998, Mckerall *et al.* 1982). These components have been proven toxic to various species of plants and animals (Murugappan *et al.* 2004, Mehra *et al.* 1998, Singh and Kumari 1999, Bryan *et al.* 2003, 2012). Although FA can be used by plants as a source of nutrient (Jala and Goyal 2006) when disposed in environment, it is toxic at higher amounts (Adriano et al. 1979). Being non biodegradable, deposition of FA remained always controversial and sensitive to environmental concerns at these sites. Coincidently, most of the thermal power stations are situated nearby protected areas (eg. Chandrapur near Tadoba-Andhari Tiger Project).

Nashik Thermal Power Station (NTPS) is one of the largest coal fired power station of the Maharashtra state that caters nearly 25% of the state's electricity requirement (http://www.nashik.com/corporate/thermal.html). Although the total installed capacity of NTPS is 910 MW (3 x 210 MW and 2 x 140 MW sets), on an average it generates around 600 Megawatts of energy (http://www.mahagencontps.com/). Subsequently, net annual deposition of FA from this station is considerably high that remains un-utilized despite series of initiatives by the Government. It has been estimated that for a normal rated generation, NTPS produces 3000 to 3500 tons of FA per day i.e. 12 million tons per annum (http://www.nashik.com/corporate/thermal.html). As a result, large amount of FA is dumped in the surrounding wastelands. FA is generally transferred in the form of slurry (mixed with water) from the source to these sites. Series of such deposition that are enacted by the weather and geographical processes convert these sites into several smaller flyash ponds (FAP). According to the Ramsar convention 1971, FAPs represent a unique example of near natural wetland type (group A, criterion 1) and support endangered species such as leopard (group B, criterion 2) (http://www.ramsar.org). Despite the fact that FA as an isolated entity toxic in nature, FAPs support significant avian diversity. Interestingly, Nandur-Madhyameshwar Bird Sanctuary (NMBS) along the Nandur-Madhyameshwar dam on Godavari River is located around 41 km from FAPs of NTPS. These manmade wetlands are studied in order to understand the pattern of association of avian species.

Methodology:

FAPs of NTPS (lies between 19°57'50.95"N to 19°58'41.19"N and 73°53'36.80"E to 73°54'43.93"E) are located ~9 km from one of the developing metropolitan city (Nashik) of Maharashtra and ~1 km from the main power plant (near Eklahare village). The study site 1 comprises FAPs and area surrounding them which includes scrubland and agricultural patches (Figure 1A). NMBS (lies between 20°00'11.82"N to 20°01'35.66"N and 74°05'53.08"E to 74°07'56.68"E) is located around 40 km from Nashik. It's a famous bird sanctuary founded by Dr. Salim Ali. The study site lies in and around backwater of Nandur-Madhyameshwar dam, situated on the Godavari and Kadwa rivers (Figure 1B). Line transects (variable width, time and length) and point census methods were adopted for bird surveys. Unidentified birds were photographed and/or videographed using Sony cybershot DSC H50. Online forums (http://www.indianaturewatch.net/) and field guides (Grimette et al. 2011, Rasmussen and Anderton 2005) were used to confirm identification. Birds were recorded as observed, heard and through secondary data obtained from amateur birdwatchers, photographers and villagers.

To understand similarity in species composition, both the ecosystems viz. FAPs and NMBS were compared using Sorensen index.

$$S = 2C / (A+B)$$

Where, S = Sorensen index value; C = number of shared species within two ecosystems (123); A: number of species in ecosystem A (FAPs) (128); B: number of species in ecosystem B (NMBS) (199).

Results:

Avian Species Diversity at FAPs and NMBS:

FAPs support 128 bird species belonging to 101 genera (Figure 2); NMBS, on the other hand, supports 199 species belonging to 133 genera (Table 1 & 2). According to IUCN redlist of endangered species (http://www.iucnredlist.org/), FAPs show presence of 3 endangered species, whereas NMBS shows presence of 4 endangered species. Endangered species recorded at FAPs include Black headed ibis, Painted stork and Long billed vulture. Some notable sightings at FAPs are that of Greater flamingos and Bar headed geese (Anil Mali,

Fig. 1: Satellite Map of study sites (Google maps). 1A: Satellite map of FAPs. White patch shows dried FAP, green patch shows Ipomoea sp. Growth over FAPs. 1B: Satellite map of NMBS. Dull black color shows backwater of the dam and green patches show small islands formed in the backwater. 1C: FAP Landscape when it dries up.

pers. Observation), Comb duck and Greylag goose. During the surveys, we encountered many instances wherein we could watch courtship and nesting behavior of several bird species (Figure 3). We were able to locate nesting of Wire tailed swallows, Coots, Spotbills, Baya weaver birds and White breasted waterhen. It is evident from these sightings that FAPs act as a breeding ground for many resident as well as few of the migratory birds.

Comparison of FAPs and NMBS: The Sorensen index value calculated for FAP and NMBS is 0.75, which suggests that there is moderately high similarity in species composition across both the systems. 5 species are unique to FAPs which were never seen at NMBS. These include Desert wheatear (Figure 3), Plain prinia, Blyth's reed warbler, Common greenshank and Rosy starling. 76 species are found to be unique to NMBS which are not shared with FAPs.

Diversity of other taxa at FAPs: A number of taxa other than avian taxa can be observed at FAPs (Table 3). We listed some of the mammalian, reptilian and Odonata species during bird surveys. At least 9 mammalian, 9 reptilian and 23 Odonata species were recorded through direct and indirect observations and through villagers' interviews. This data shows that large mammals such as wild boar, leopard etc. (Figure 3) forage in and around FAPs. FAPs are rich in Odonata diversity. The group Odonata being completely dependent on water for their breeding (Subramanian K.A. 2009) suggests that FAPs act as a breeding ground for several Odonata species.

Hunting Pressure on FAPs: FAPs are not legally protected. There is high hunting pressure on these sites. During some instances we observed hunters killing Brahminy shelducks, Lesser whistling ducks (Figure 3), Spotbills etc. Fish nets and ground traps are used to capture ducks when they come out of the pond to rest at the shore.

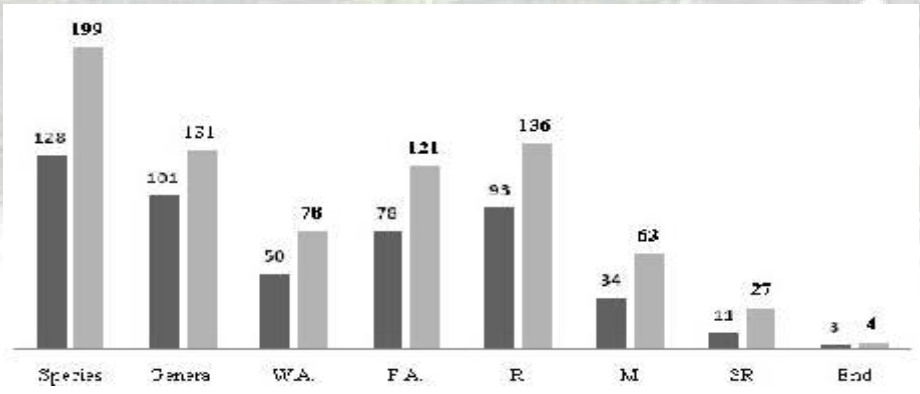

Fig. 2. Residential Status of FAP and NMBS Birds. W.A.: Wetland Associated; F.A.: Scrubland / Agricultural Land Associated; R: Resident; M: Winter Migratory; SR: Scarce Records in and around Nashik (less frequent sightings); End: Endangered Species (According to IUCN 2011 status)

Discussion:

The FAP of NTPS can be divided into three major landscape elements (LSE): wetland, scrubland and agricultural land. Despite the fact that species dependent on scrubland are more in number in the total list (Table 2), the wetland might be acting as a good foraging site for scrubland birds. Many of the forest associated birds (Baya weaver bird, Prinias etc.) were found nesting on Acacia sp. inside FAPs. High diversity at FAPs can be thought to be a function of habitat heterogeneity and net food resource availability. The study site of NMBS can be divided into five major LSEs: wetland, scrubland, agricultural land, grassland/reedbeds, Nilgiri plantation. Although NMBS has greater habitat heterogeneity as compared to FAPs most of the area of NMBS is under wetland which directly reflects in its total number of wetland associated species.

NMBS is an ideal habitat for some of the winter migratory birds and it is an obvious choice as a breeding ground for some. We were able to observe nesting of Streak throated swallows (approx. 50 nests) at NMBS. We suspect that high avian species diversity at FAPs might be contributed by NMBS to some extent. The thought behind this idea can be easily ascertained if one observes the aerial distance between these two sites. Although it takes 41 kms. to travel to NMBS from FAPs via road, by air (Crow flight distance) it is 21 kms. We suspect that birds of NMBS come foraging to FAPs and breed at NMBS. Even if this scenario proves to be true, it does not decrease the value of FAPs as a high avian species diversity wetland.

FA has always been the centre of controversy for many of the power generation stations. FA frequently percolates and contaminates groundwater. During rainy seasons, when FAPs are flooded, agriculture at foothills of FAPs gets adversely affected by deposition of FA. During summer season, FAPs become dried and FA disperses in the agricultural fields via wind. A recent study based on the environmental magnetic analysis of the soil revealed that the FA particles may get dispersed up to a radius of 6 km from FAPs (Basavaiah et al., 2012). Villagers residing near FAPs are badly affected by these problems. The land prizes around FAPs have decreased drastically. FAPs are not legally protected hence; hunting of water birds is frequent at FAPs. From our experience of our study we have developed a strategy (Figure 4), wherein flyash ponds can be converted into eco parks which in turn will protect these sites; at the same time it will provide alternate employment option for those affected by the

Fig. 3: Fauna observed at the fly ash pond. 1- Leopard pugmark at the dried FAP; 2- Black Winged Stilts, Garganey and Wood Sandpipers Feeding at FAP; 3- Banded Kukari snake at FAPs; 4- Senegal golden dartlets mating at FAPs.; 5- Lesser Whistling Duck captured by hunters

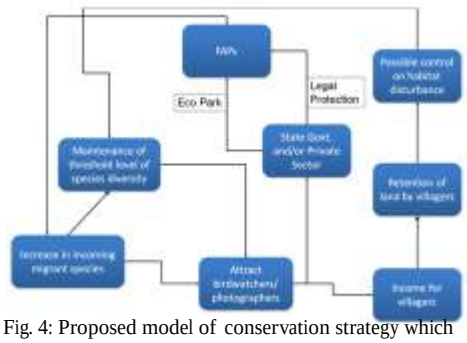

Fig. 4: Proposed model of conservation strategy which can be applied at FAPs

ill effects of flyash.

According to the latest studies on wetlands of India, the Maharashtra state occupies approximately 1 m ha area of inland and/or coastal wetlands (Panigrahy *et al.*, 2012). This is of utmost importance to understand and prioritize the need for conservation of such habitats. Unique new landscapes like flyash ponds are not well studied. Such sites can act as good resource centers for nature education and scientific research.

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Table 1. Comparative Avian Species Account of two Ecosystems: FAPs and NMBS

Species Distribution	FAPs	NMBS
Species	128	199
Genera	101	131
Wetland Associated	50	78
Forest Associated (Other than Wetland)	78	121
Resident	93	136
Migratory	35	63
Scarce Records in and around Nashik	4	23
Endangered (as listed by IUCN 2011)	3	8
Unique Species	5	76

Table 2: Avian Species Account for Flyash Ponds

No.	Scientific Name	Common Name	R/M	IUCN	WA
1	*Accipitar badius*	Shikra	R	LC	0
2	*Acridotheres tristis*	Common Myna	R	LC	0
3	*Acridotheres fuscus*	Jungle Myna	R	LC	0
4	*Acrocephalus dumetorum*	Blyth's Reed Warbler	PV; SR	LC	0
5	*Actitis hypoleucos*	Common Sandpiper	R	LC	1
6	*Aegithina tiphia*	Common Iora	R	LC	0
7	*Alcedo atthis*	Common Kingfisher	R	LC	1
8	*Amandava amandava*	Red Adavat	R	LC	0
9	*Amaurornis phoenicurus*	White Breasted Waterhen	R	LC	1
10	*Ammomanes phoenicura*	Rufous Tailed Lark	R	LC	0
11	*Anas strepera*	Gadwall	M	LC	1
12	*Anas querquedula*	Garganey	M	LC	1
13	*Anas clypeata*	Northern Shoveller	M	LC	1
14	*Anas crecca*	Common Teal	M	LC	1
15	*Anastomus oscitans*	Asian Openbill	M	LC	1
16	*Anser indicus*	Bar Headed Geese*	M	LC	1
17	*Anser anser*	Greylag Goose*	M	LC	1
18	*Anthus rufulus*	Paddyfield Pipit	R	LC	0
19	*Apus nipalensis*	House Swift	R	LC	0
20	*Aquila rapax*	Tawny Eagle	R	LC	0
21	*Ardea cinerea*	Grey Heron	M	LC	1
22	*Ardea purpurea*	Purple Heron	M	LC	1
23	*Ardeola grayii*	Indian Pond Heron	R	LC	1
24	*Athene brama*	Spotted Owlet	R	LC	0
25	*Bubulcus ibis*	Cattle Egret	R	LC	1
26	*Burhinus oedicnemus*	Eurasian Thick Knee	R	LC	0
27	*Caprimulgus asiaticus*	Indian Nightjar	R	LC	0
28	*Carpodacus erythrinus*	Common Rosefinch	M	LC	0
29	*Centropus sinensis*	Southern Coucal	R	LC	0
30	*Cerecomela Fusca*	Brown Rockchat	R	LC	0
31	*Ceryl rudis*	Pied Kingfisher	R	LC	1
32	*Charadrius dubius*	Little Ringed Plover	R	LC	1
33	*Chrysomma sinense*	Yellow Eyed Babbler	R	LC	0
34	*Ciconia episcopus*	Wooly Necked Stork	M	LC	1
35	*Circus aeruginosus*	Eurasian Marsh Harrier	M	LC	1
36	*Cisticola juncidis*	Zitting Cisticola	M	LC	0
37	*Columba livia*	Rock Pigeon	R	LC	0
38	*Copsychus saularis*	Magpie Robin	R	LC	0
39	*Coracious benghalensis*	Indian Roller	R	LC	0
40	*Corvus splendens*	House Crow	R	LC	0
41	*Corvus macrorhynchos*	Large Billed Crow	R	LC	0
42	*Coturnix coromandelica*	Rain Quail	R	LC	0
43	*Dendrocygna javanica*	Lesser whistling duck	R	LC	1
44	*Dicaeum erythrorhynchos*	Pale-billed Flowerpecker	R	LC	0
45	*Dicrurus leucophaeus*	Ashy Drongo	M	LC	0
46	*Dicrurus macrocercus*	Black Drongo	R	LC	0
47	*Egretta garzetta*	Little Egret	R	LC	1
48	*Elanus caeruleus*	Black shouldered Kite	R	LC	0
49	*Erempotera grisea*	Ashy Crowned Sparrow Lark	R	LC	0
50	*Eudynamys scolopacea*	Asian Koel	R	LC	0
51	*Falco tinnunculus*	Common Kestrel	M	LC	0
52	*Falco peregrines*	Peregrine Falcon	R; SR	LC	0
53	*Fulica atra*	Common Coot	R	LC	1
54	*Gallinago gallinago*	Common Snipe	M	LC	1
55	*Gallinula chloropus*	Common Moorhen	R	LC	1
56	*Gyps indicus*	Long-billed Vulture	R; SR	CE	0
57	*Halcyon smyrnensis*	White breasted Kingfisher	R	LC	1
58	*Haliastur indus*	Brahminy Kite	R	LC	0
59	*Himantopus himantopus*	Black winged stilt	M	LC	1
60	*Hirundo rustica*	Barn Swallow	M	LC	0
61	*Hirundo concolor*	Dusky Crag Martin	R	LC	0
62	*Hirundo daurica*	Red Rumped Swallow	R	LC	0
63	*Hirundo smithii*	Wire Tailed Swallow	R	LC	0
64	*Hydrophasianus chirungus*	Pheasant Tailed Jacana	R	LC	1
65	*Ixobrychus cinnamomeus*	Cinnamon Bittern	R	LC	1
66	*Lanius vittatus*	Bay backed shrike	R	LC	0
67	*Lanius schach*	Long Tailed Shrike	R	LC	0
68	*Lonchura malacca*	Black Headed Munia	R	LC	0
69	*Lonchura malabarica*	Indian Silverbill	R	LC	0
70	*Lonchura punctulata*	Scaly Breasted Munia	R	LC	0
71	*Luscinia svecica*	Bluethroat*	R	LC	0
72	*Megalaima haemacephala*	Coppersmith Barbet	R	LC	0
73	*Merpos orientlis*	Green Bee eater	R	LC	0
74	*Mesophoyx intermedia*	Intermediate Egret	R	LC	1
75	*Milvus migrans*	Black Kite	R	LC	0
76	*Mirafra erythroptera*	Indian Bush Lark	R	LC	0
77	*Motacilla cinerea*	Grey Wagtail	M	LC	1
78	*Motacilla madaraspatensis*	White Browed Wagtail	R	LC	1
79	*Motacilla flava*	Yellow Wagtail	M	DD	1
80	*Motacilla citreola*	Citrine Wagtail	M	LC	1
81	*Mycteria leucocephala*	Painted Stork	M	NT	1
82	*Nectarinia zeylonica*	Purple Rumped Sunbird	R	LC	0
83	*Nectarinia asiatica*	Purple Sunbird	R	LC	0
84	*Nycticorax nycticorax*	Black Crowned Night Heron	R	LC	1
85	*Ocyceros birostris*	Indian Grey Hornbill	R	LC	0
86	*Oenanthe deserti*	Desert Wheatear	M; SR	LC	0
87	*Orhotomus sutorius*	Common Tailorbird	R	LC	0
88	*Parus major*	Great Tit	R	LC	0
89	*Passer domesticus*	House sparrow	R	LC	0
90	*Pavo cristatus*	Indian Peafowl	R	LC	0
91	*Pericrocotus cinnamomeus*	Small Minivet	R	LC	0
92	*Phalacrocorax niger*	Little Cormorant	R	LC	1
93	*Phoenicopterus ruber*	Greater Flamingos*	M	LC	1
94	*Phoenicurus ochruros*	Black Redstart	M	LC	0
95	*Platalea leucorodia*	Eurasian Spoonbill	M	LC	1
96	*Platalea leucorodia*	Eurasian Spotbill	R	LC	1
97	*Plegadis falcinellus*	Glossy Ibis	M	LC	1
98	*Ploceus philippinus*	Baya weaver bird	R	LC	0
99	*Porphyrio porphyrio*	Purple Swamphen	R	LC	1
100	*Prinia socialis*	Ashy Prinia	R	LC	0
101	*Prinia inornata*	Plain Prinia	R	LC	0
102	*Pseudibis papillosa*	Black Ibis	R	LC	1
103	*Psittacula krameri*	Rose Ringed parakeet	R	LC	0
104	*Pycnonotus cafer*	Red vented Bulbul	R	LC	0
105	*Rhipidura albigularis*	White Spotted Fantail	R	LC	0
106	*Sarkidiornis melanotus*	Comb Duck	M	DD	1
107	*Saxicola torquata*	Common Stonechat	M	LC	0
108	*Saxicola caprata*	Pied Bushchat	R	LC	0
109	*Saxicoloides fulicata*	Indian Robin	R	LC	0
110	*Steptopelia chinensis*	Spotted Dove	R	LC	0
111	*Sterna aurantia*	River Tern	R	LC	1
112	*Streptopelia decaocto*	Eurasian Collared Dove	R	LC	0
113	*Streptopelia senegalensis*	Laughing Dove	R	LC	0
114	*Sturnus pagodarum*	Brahminy Starling	R	LC	0
115	*Sturnus roseus*	Rosy starling	M; SR	LC	0
116	*Tachybaptus ruficollis*	Little Grebe	R	LC	1
117	*Tadorna ferruginea*	Brahminy ducks	M	LC	1
118	*Threskiornis melanocephalus*	Black Headed Ibis	R	NT	1
119	*Tringa ochrpous*	Green Sandpiper	M	LC	1
120	*Tringa glareola*	Wood Sandpiper	M	LC	1
121	*Tringa nebularia*	Common Greenshank	M	LC	1
122	*Turdoides caudatus*	Common Babbler	R	LC	0
123	*Turdoides striatus*	Jungle Babbler	R	LC	0
124	*Turdoides malcolmi*	Large Grey Babbler	R	LC	0
125	*Upupa epops*	Common Hoopoe	R	LC	0
126	*Vanellus atrounchalis*	Red Wattled Lapwing	R	LC	1
127	*Zoonavena sylvatica*	White Rumped Needletail	R;SR	LC	0
128	*Zosterops palpebrosus*	Oriental White Eye	R	LC	0

*: As told by Birdwatchers/Photographers/Local Villagers/Hunters; Bold letters refers to birds which are unique to FAPs; R: Resident; M: Migratory; PV: Passage Visitor; SR: Scarse Records in and around Nashik; LC: Least Concern; NT: Near Threatened; CE: Critically Endangered; DD: Data Deficient; WA: Wetland Associated

Table 3: Mammalian, Reptilian and Odonata Fauna of FAPs

I. Mammalian Data

Common Name of Mammals	Scientific Name	IUCN	Status Remarks
Indian Grey Mongoose	*Herpestes edwardsii*	LC	
Indian Palm squirrel	*Funambulus palmarum*	LC	
Indian Hare	*Lepus nigricollis*	LC	
Indian Wild Boar	*Sus scrofa*	LC	
Small Indian Civet	*Viverricula indica*	LC	dead individuals
Leopard	*Panthera pardus*	NT	Pugmarks, local news
Indian Fox	*Vulpes bengalensis*	LC;	decreasing as told by local villagers

II. Reptilian Data

Common Name of Reptiles	Scientific Name	IUCN Status
Oriental Garden Lizard	*Calotes versicolor*	DD
Spectacled Cobra	*Naja naja*	DD
Striped Keelback	*Amphiesma stolatum*	DD
Checkered Keelback	*Xenopus picsator*	DD
Common Kukri Snake	*Oligodon arnensis*	DD
Green Keelback	*Macropisthodon plumbicolor*	DD
Oriental Rat Snake	*Ptyas mucosus*	DD
Indian Skink	*Sphenomorphus indicus*	DD
Common Indian Monitor Lizard	*Varanus bengalensis*	LC, decreasing

III. Odonata Data

No.	Common Name of Odonates	Scientific Name
Dragonfly		
1	Blue Tailed Green Darner	*Anax guttatus*
2	Common Clubtail	*Ictinogomphus rapax*
3	Common Hooktail	*Paragomphus lineatus*
4	Trumpet Tail	*Acisoma panorpoides*
5	Ditch Jewel	*Brachythemis contaminate*
6	Granite Ghost	*Bradinopyga geminata*
7	Ruddy Marsh Skimmer	*Crocothemis servilia*
8	Ground Skimmer	*Diplacodes trivialis*
9	Pied Paddy Skimmer	*Neurothemis tullia*
10	Blue Marsh Hawk	*Orthetrum glaucum*
11	Crimson Tailed Marsh Hawk	*Orthetrum pruinosum*
12	Green Marsh Hawk	*Orthetrum sabina*
13	Wandering Glider	*Pantala flavescens*
14	Yellow Tailed Ashy Skimmer	*Potamarcha congener*
15	Red Marsh Trotter	*Tramea basilaris*
16	Long Legged Marsh Glider	*Trithemis pallidinervis*
17	Pygmy Dartlet	*Agriocnemis pygmaea*
Damselfly		
18	Coromandel Marsh Dart	*Ceriagrion coromandelianum*
19	Golden Dartlet	*Ischnura aurora*
20	Senegal Golden Dartlet	*Ischnura senegalensis*
21	Blue Grass Dartlet	*Pseudagrion microcephalum*
22	Saffron Faced Blue Dart	*Pseudagrion rubriceps*
23	Emerald spreadwing	*Lestes elatus* Hagen

Status of water birds and breeding birds of Nelapattu bird Sanctuary, Andhra Pradesh, India.

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Abstract

Nelapattu Bird Sanctuary the biggest pelicanary located in Nellore district, Andhrapradesh was studied from November 2008 till April 2009. During the period 37 species belonging to 14 families were recorded. The wetland was dominated by two species of plants i.e. Barringtonia acutangula and Prosopis juliflora. The Prosopis plants were used for roosting while the birds built their nest on the submerged Barringtonia trees. Withdrawal of water for agriculture was seen to be a major threat to the conservation of the wetland.

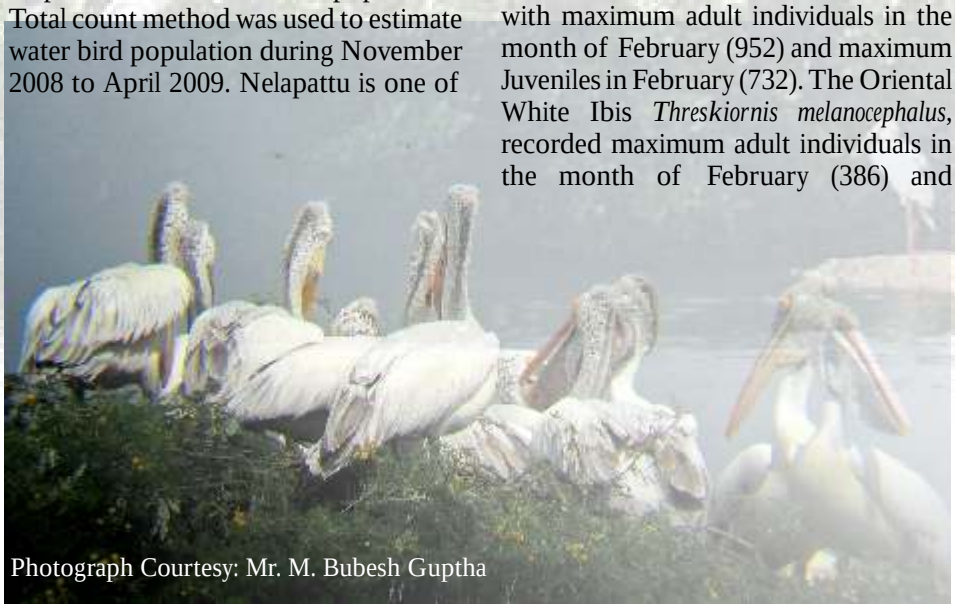
Keywords: Nelapattu Bird Sanctuary, Pelicanary, Barringtonia acutangula and Prosopis juliflora, agriculture.

Wetlands are important bird habitats that provide important livelihood to the local inhabitants. Wetlands have been drained, modified, or created to produce or enhance agricultural crops and also treated as waste disposal areas around the world. This degradation has had an incalculable effect on wildlife numbers, water quality, hydrological cycles and other wetland functions and values. Nelapattu Bird sanctuary is one of the biggest Pelicanary and important breeding and roosting site for long distant and local migratory birds located in Nellore District, Andhra Pradesh, India. The sanctuary has an area of 458.92 ha and consists of freshwater ponds in core area of 82.56 ha with dominance of *Barringtonia acutangula* trees and very few *Prosopis juliflora* thorny plants which grow in the water body, *Prosopis juliflora* is more on the tank bund where the birds roost. This study was undertaken to assess the winter migrant (WM) birds, with special emphasis on water birds population. Total count method was used to estimate water bird population during November 2008 to April 2009. Nelapattu is one of the important breeding ground for water birds. A total of 37 species were reported belonging to the 14 families. Ardeidae families were represented by ten species followed by Ardeidae, Rallidae, Charariidae and Alcidinidae. Highest number of birds were recorded in month of March (3110 individuals) followed by February (2966 individuals), January (2606 individuals), December (2104 individuals), November (1809 individuals) and April with 1216 individuals had the lowest population. 21 species are Resident (R) followed by Three (3) Summer Migrant (SM) species and 13 species are Winter Migrant (WM).

During our study period, out of 37 species of birds, major three species of breeding birds were recorded. Of the three the Spot billed Pelican *Pelecanus philippensis* recorded maximum number of adult individuals in the month of February (973) and maximum juvenile were recorded in the month of March (798). The Open billed stork *Anastomus oscitans* followed the Spot billed Pelican with maximum adult individuals in the month of February (952) and maximum Juveniles in February (732). The Oriental White Ibis *Threskiornis melanocephalus*, recorded maximum adult individuals in the month of February (386) and subsequent maximum juveniles in the month of February (366).

Vegetation cover was an important factor to determine the bird abundance and diversity. The winter migratory birds Pelicans, Open bill storks, White ibis, Cormorants, Large egrets, Little egrets, Ducks etc. occupy different specific areas of trees and show a vertical gradient or strata. The top branches of the tree or canopy are occupied by Pelicans and Open bill storks, followed by White ibis and at lower level strata, Egrets, Herons and Cormorants. The Ducks like, Northern Shovellers, Northern Pintail, Spot billed duck, Comb duck, Red crested pochard a few waders like Common Sand Plover, Kentish Plover, Sand Plover are observed in the lower most water surface containing water weeds.

Threats and Conservation issues: Droppings of pelican and other birds enrich the soil and water, which is used by the villagers for irrigation. The prime conservation issue on which the survival of this Pelicanry depends is the growth of Barringtonia trees. The pelican and other birds nest on submerged *Barringtonia acutangula*. Earlier, the trees used to be surrounded by water for many months, till the chicks were able to fly. But now, influential farmers draw out the water through motor pumps, thus the tank dries up much faster. To safeguard the interests of the villagers, the Wildlife Wing has taken up eco-developmental activities. Tank bund damaged during rainy season needs to be strengthened. Further, surveys and intensive studies in various seasons of the year will bring out better results for the conservation of the Sanctuary.



Photograph Courtesy: Mr. M. Bubesh Guptha

Influence of rainfall on the wetlands in Jalore district, Rajasthan

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Abstract

Rainfall is an important source of water for agriculture and for maintaining the water levels of wetlands. We studied the annual average rainfall of three decades for Jalore district in Rajasthan. The district occupies 3.11% of land area of Rajashtan with 17 wetlands that are ecologically significant. We observed that the wetlands over the decades have undergone drastic changes due to decreasing rainfall and increase in the land use change.

Keywords: Jalore district, Rainfall, wetlands, Land use change.

Districts are considered as the smallest administrative units in India. There is a real need for districts rainfall data to better manage the water resources for agriculture and administrative allied purposes (Guhathakurta and Rajeevan, 2008). Jalore district is situated in the south west part of arid region of Rajasthan. The total area of the district is 10,640 Sq. km. which occupies 3.11% land area of Rajasthan. Jalore district is bordered in the north-west by Barmer, south east by Sirohi, north east by Pali of Rajasthan and on south west by Banaskantha district of Gujarat. It is one of the important districts adjacent to Thar desert in terms of natural water resources. Sukri is the main river that flows through Jalore and the whole district is a part of Luni Basin. Climate is very dry with low annual rainfall (444 mm) and extreme temperatures, January being the coldest month, temperatures drop down to 1^0C and during June average daily temperature around 41^0 to 42^0 C. Some day's the temperature reaches up to 48^0 C. The economy of Jalore district is largely relies on animal husbandry and agriculture.

The prevailing monsoon winds that bring rain to the rest of India in summer tend to bypass the west of Rajasthan. Rainfall directly or indirectly influences the health of wetland habitats. Total number of wetlands in Jalore district is 17 which cover 1.54 sq km land area. According to SAC (1998) the state has 1.01% of its land covered by wetlands (each sizes 56.25 ha or above). The number of wetlands in the north-west part of Rajasthan is comparatively lower than the south-east.

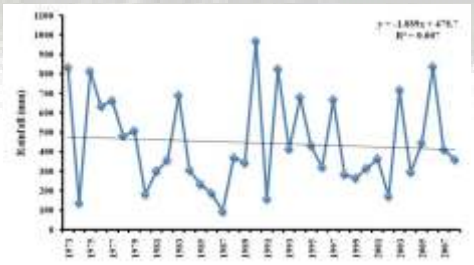

Figure1: Annual rainfall trend in Jalore district, Rajasthan.

We examined the rainfall pattern in Jalore district, using monthly rainfall data obtained for 36 years during the period 1973 – 2008. The data was collected from five rain gauge stations namely Jalore, Ahore, Bhinmal, Sanchore and Jaswantpura present in Jalore district which were maintained by India Meteorological Department (IMD) (Fig. 1). The arithmetic average of annual rainfall for Jalore district was 444 mm. Gradual decreasing trend in annual rainfall was observed for Jalore distrct over the 34 years (Fig. 2) If we consider three decades of rainfall data from 1973 to 2002, average rainfall was 488.51, 414.94 and 388.95mm. During these three decades a total of 99.55 mm decline in rainfall was observed. Studies have reported a significant decline of rainfall in other parts of India such as Madhya Pradesh and adjoining areas, north-east India and parts of Gujarat and Kerala during the same time period (Rupa Kumar *et al* 1992).

As reported by Vijayan *et al* (2004) the wetland area in Jalore district is least in terms of land cover (0.01%) but holds greater ecological significance. Despite the ecological importance, it was estimated that about 95% of wetland area in Jalore district had undergone drastic changes over the past few decades (SAC, 1998). Decreasing rainfall and intense anthropogenic pressure on wetlands are presumably important factors for the drastic decline in wetland and land cover. If this scenario continues, Jalore district cannot be prevented from becoming a part of Thar desert in the next few decades. Necessary actions such as increasing forest cover through afforestation using indigenous tree species and proper rain water harvesting system to improve the ground water level and water holding capacity of the existing wetlands can be the better options for combating desertification in Jalore district. Active involvement of Government and Non Governmental Organizations (NGO) and public is imperative in combating desertification. Hence, awareness should be created among people at all levels in this regard and involve people in conserving the wetland habitats in this arid region.

Figure 2: Map showing five rain gauge stations in Jalore district of Rajasthan.

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Riparian flora along the ravines of National Chambal Sanctuary

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Abstract:

National Chambal sanctuary was surveyed to document its floral diversity. We identified five habitats along the length of Chambal River and recorded the distribution of 61 species of Angiosperms in these habitats. The flowing river habitat had the maximum diversity of 20 species. The family Poaceae with six species was observed in all the habitats. Potamogetonaceae, Hydrocharitaceae and Alismataceae were families unique to the aquatic habitat.

Keywords: Angiosperm diversity, Family Poaceae, Chambal, Ravine

Introduction:

The Chambal is a perennial river, which originates in Vindhya Range near Mhow district of Madhya Pradesh, it as a large catchment in the Malwa plateau. It flows in a North-eastern direction, passing through Rajasthan up to the point where its major tributary Parbati joins it near Pali. Thereafter it flows in an eastern direction, forming the boundary of Madhya Pradesh and Rajasthan. Further, it forms the border between Madhya Pradesh and Uttar Pradesh up to the confluence of Chambal and Yamuna near Etawah in Uttar Pradesh. Three major tributaries join the Chambal, *viz*. Parbati, Kali Sindh and Banas. The mean annual rainfall over the Chambal Basin was computed as 797 mm, of which about 93% falls during the four Monsoon months (June-September). Temperature varies between maximum 42.6°C to minimum 29.7°C during summer (March to June) and maximum 24.5°C to minimum 11.6°C during winter (November to February).

Chambal River passes through a unique terrestrial ravine ecosystem consisting of sand banks, pebble banks, rocks and boulders spread across the banks along the entire stretch of the river. It is heavily interspersed by large agricultural lands altogether forming a diversified habitat for a variety of flora and fauna. Ravines act as natural barriers to the flood waters of the river in the monsoon. The ravines have twisting winding pathways, with loose soil, rocky areas and thorny vegetation. Islands in the river also provide an excellent breeding and basking ground for several birds and reptiles. The National Chambal Sanctuary was created with Gharial *Gavialis gangeticus* as its flagship species, this entire diverse habitat acts as wild haven to many rare and endangered fauna. There are very few records of the plants existing along the entire length of the 110 Km stretch of National Chambal Sanctuary. Here we have attempted to document plants from the entire stretch along the Rajasthan bank seen during the month of December 2009.

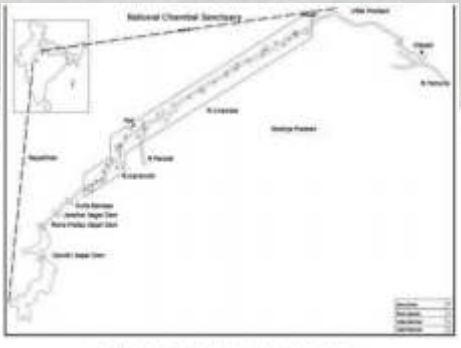

Fig.1 Map of River Chambal, highlighting the National Chambal Sanctuary

Materials and method:

Geographically, the Sanctuary lies between the latitude 25° 35' N and 26° 52' N and longitude 76°28' E and 79° 01 E. Field map sheets were prepared from 1:50,000 scale maps. Geographical coordinates were calculated from the topo maps. A rapid survey of the flora was carried out in entire stretch of 110 kilometres (Fig. 1)over 11 days during December 2009 along the Rajasthan bank.

The entire length of the National Chambal Sanctuary between village Pali and village Khirkan was divided into 10 segments based on the adjacent villages on the Rajasthan bank. Each of the segment was surveyed for an entire day, over 11 days. Time of sampling was between 1000 hrs and 1700 hrs. The first segment of the stretch i.e., from Pali to Rameshwaram [*approx*. 20 km] was surveyed on a motorboat. This stretch lies within the tourism zone of the sanctuary. The remaining part of the stretch, from Rameshwaram to Khirkan was surveyed on foot, along the river bank.

The documentation involved and recording the flora and land use patterns along the banks. Plants were identified on the field using The Flora of Rajasthan, BSI manual by Shetty & Singh (1987 - 1993) and the identification was confirmed by comparing a collected specimen with that deposited in St. Xavier College, Herbarium (BLAT). Nomenclature of the plants is updated following the recent literature provided on the websites www.tropicos.org/, www.theplantlist.org. Five habitat types were recognized and identified on base of geomorphic features. The plants were then classified according to their habitat, in which they were recorded.

Result and discussion:

We recorded a total of 61 species belonging to 31 families, while surveying the National Chambal sanctuary (Table 1). The Poaceae was the dominant family with six species followed by Cyperaceae family. The plants belonging to Poaceae family were observed in all the habitats of the sanctuary. Five types of habitats were seen along the entire study area (Plate1) i.e. Ravine (R), Flowing river (A), Marshy river bed (RB), Sand Bank (SB) and Cultivated land (CUL). A few plants did overlap the habitats at the margins but there was no species that was observed across the entire length of the sanctuary. Potamogetonaceae, Hydrocharitaceae and Alismataceae are families unique to the aquatic habitat, while the other habitats did not have any such families

Classification of plants according to their habitats reveals that, in the study area the number of plant species found in flowing river habitat is more i.e. 20 species followed by Ravines. The Bray Curtis Cluster analysis (Fig. 2) also shows that the River bank and the Cultivated Agricultural Fields had similar flora.

Further a detailed study of the flora should be undertaken across the length of the National Chambal River Sanctuary. This will help in managing the sanctuary better and protecting the habitat of the Ganges Gharial *Gavialis gangeticus.*

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Table 1: List of plants observed along the National Chambal River Sanctuary.

Family	Genus species	Habitat
Acanthaceae	*Adathoda vasica*	R
Acanthaceae	*Andrographis paniculata* (Burm. f.) Wall. ex Nees	R
Acanthaceae	*Peristrophe paniculata* (Forssk.) Brummitt	R
Alismataceae	*Limnophyton obtusifolium* (L.) Miq.	A
Alismataceae	*Sagittaria sagittifolia* L.	A
Amaranthaceae	*Achyrathus aspera* L.	RB
Amaranthaceae	*Gomphrena celosioides* Mart.	RB
Amaryllidaceae	*Crinum defixum*	RB
Aponogetonaceae	*Aponogeton natans* (L.) Engl. & generic Krause	A
Asclepidaceae	*Calotropis gigantia* (L.) W. T. Aiton	R
Asclepidaceae	*Calotropis procera* (Aiton) W. T. Aiton	R
Asclepidaceae	*Leptadenia pyrotechnica* (Forssk.) Decne.	SB
Asclepidaceae	*Pergularia demia*	R
Asteraceae	*Parthenium hysterophorus* L.	RB
Asteraceae	*Pulicaria angustifolia* DC.	R, CUL
Boraginaceae	*Rotula aquatic* Lour.	A
Brassicaceae	*Brassica juncea*	CUL
Capparidaceae	*Capparis decidua* (Forsk.) Edgew.	R
Cleomaceae	*Cleome gynandra*	RB
Combretatceae	*Anogeissus pendula* (Edgew.)	R
Combretatceae	*Terminalia arjuna*	RB
Convolvulaceae	*Convolvulus prostates* Forssk.	SB
Convolvulaceae	*Ipomoea aquatic* Frossk.	A
Convolvulaceae	*Ipomoea carnea* Jacq.	A
Convolvulaceae	*Merremia gangetica* Cufod.	A
Cyperaceae	*Cyperus exaltatus* Retz.	A
Cyperaceae	*Cyperus rotundus* L.	RB
Cyperaceae	*Eleocharis geniculata* (L.) Roem & Shult.	A
Cyperaceae	*Fimbristylis tetragona* R. Br.	A
Cyperaceae	*Schoenoplectus littoralis* (Schrad.) Palla	A
Euphorbiaceae	*Chrozophora prostrate* Dalzell & Gibson	RB
Fabaceae	*Butea monsperma* (Lam.) Taub.	R
Fabaceae	*Cajanus cajan*	CUL
Fabaceae	*Labalum purpurences*	CUL
Fabaceae	*Pongamia pinnata*	RB
Gentianaceae	*Exacum pedunculatum* L.	RB
Hydrocharitaceae	*Hydrilla verticillata* (L. f.) Royle	A
Hydrocharitaceae	*Nechamandra alternifolia* (Roxb.) Thwaites	A
Hydrocharitaceae	*Vallisneria spiralis* L.	A
Lamiaceae	*Leucas biflora*	R
Lamiaceae	*Ocimum bascilicum*	R
Lytraceae	*Ammannia baccifera* L.	RB
Malvaceae	*Hibiscus canabinus*	RB
Menyanthaceae	*Nymphoides cristata* (Roxb.) Kuntze	A
Mimosaceae	*Acacia nelotica* (L.) Willd. ex Delile	R
Mimosaceae	*Dichrostachys cinerea* (L.) Wight & Arn.	R
Mimosaceae	*Prosopis juliflora* (Sw.) DC	R
Papavaraceae	*Argemone mexicana* L.	RB
Poaceae	*Aristida adscensionis* L.	R
Poaceae	*Cenchrus biflorus* Roxb.	R
Poaceae	*Coix lacryma-jobi*	A
Poaceae	*Saccharum spontaneum* L.	A
Poaceae	*Triticum sativum*	CUL
Poaceae	*Sporobolus diander* (Retz.) P. Beauv.	RB
Polygonaceae	*Polygonum glabrum* Willd.	A
Potamogetonaceae	*Potamogeton perfoliatus* L.	A
Salvadoraceae	*Salvadora Oleoides* Decne	R
Solanaceae	*Datura inoxia* Mill.	R
Solanaceae	*Solanum virginianum* L.	SB
Tamaricaceae	*Tamarix aphylla* (L.) H. Karst.	SB
Tiliaceae	*Grewia tenax*	R

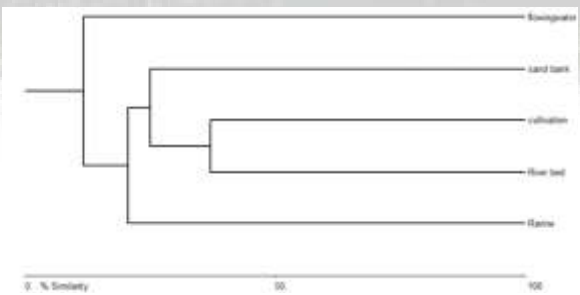
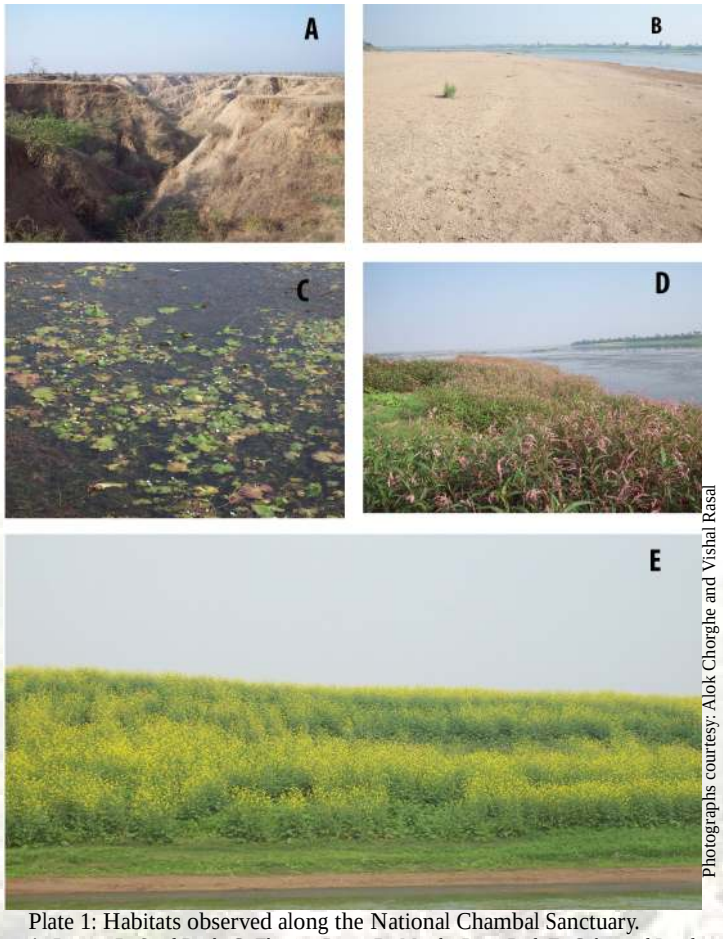


Fig.2:Bray-Curtis Cluster Analysis for similarity between the habitats.



Photographs courtesy: Alok Chorghe and Vishal Rasal

Plate 1: Habitats observed along the National Chambal Sanctuary.
A- Ravine; B- Sand Bank; C- Flowing River; D- Marshy River Bed; E- Cultivated Land

Photographs courtesy: Alok Chorghe and Vishal Rasal

Plate 1: Some flora observed along the National Chambal Sanctuary.
A- *Calotropis procera* (Aiton) W.T. Aiton; B- *Pergularia demia*; C- *Leptadenia pyrotechnica* (Forrsk.) Decne; D- *Nymphoides cristata* (Roxb.) Kuntze; E- *Exacum pendunculatum* L.; F- *Grewia tenax* (Forssk.) Fiori; G- *Crinum defixum* Ker Gawl.; H- *Sagittaria sagittifolia* L.; *Potamogeton natans* L.; J- *Potamogeton perfoliatus* L.; K- *Tamarix aphylla* (L.) H. Karst.

World Wetland Day 2012
Source: www.ramsar.org

World Wetland Day is celebrated on 2nd February each year to mark the signing of the convention on Wetlands at Ramsar, Iran in 1971 with the main mission of Conservation of Wetlands at a global level. As is known, Wetlands are among the most precious natural resources and perform multiple environmental functions and provide various ecosystem services for the welfare of humanity. Their insensitive depletion, despite their exceedingly critical role to human survival, is indeed a matter of great concern.

In each country the day is celebrated by organizing various activities like wetland visits, panel discussions, cultural programs, conferences, exhibition /painting/ slogan/quiz contests for different levels of society. Ramsar Convention chooses different themes every year for celebrating this auspicious occasion. This year's theme for World Wetland Day was 'Wetlands and Tourism'. A National level programme for World Wetland Day this year was organized at Thiruvananthapuram in Kearla in collaboration with Kerala State Council for Science Technology for environment and Centre for Earth Science Studies at Kanakakunnu Palace.

On first February various competitions were organized with different levels of students on various environmental themes. On 2nd February a seminar on wetland & tourism was organized. The inauguration of the national celebration and the seminar was done by Shri Oommen Chandy Hon'ble Chief Minister of Kerala and the meeting was presided over by Shri K. Muraleedharan, MLA. Chief Minister informed about setting up of Wetland Authority in a State and also opening up of Wetland Institute at Kottayam. He also informed that State Govt.

was preparing comprehensive Management Action Plans for all the identified Wetlands from the State. He was of the opinion that Kerala has a bright future for ecotourism and this can be the best method for preserving our cultural heritage. He gave away trophies and certificates to prize winning students who won various competitions on the eve of World Wetland Day.

Shri Murleedharan in his presidential speech laid emphasis on degradation of wetland s in the State and urged for their immediate protection and conservation. Mrs. Meera Mahrishi, Additional Secretary, MoEF talked about various threats to water bodies and how we can combat these through various schemes launched in the Ministry for conservation of water bodies. She also informed the gathering that National Wetland Programme has been merged with the National lake conservation plan to give it more strength and deal it in a multi-disciplinary manner.

Executive Vice President of KSCST and ex-officio Principal Secretary, Science & Technology Department, Prof. V.N Rajsekhran Pillai outlined the importance of the Wetlands in mitigating climate change. Advisor (MoEF) Dr. S. Kaul wanted more pro-active attitude of the State Govt. to deal with environmental issues and requested State Govt. to make this programme more meaningful and result oriented in terms of execution. He also emphasized on need for formidable data base in the field of Research and Development so that it is helpful in preparing predictive models for Wetland restoration. He promised all help from Ministry in this regard as and when required. Director (CESS) Dr. N.P. Kurian informed about various action programmes in state for wetland conservation. Member Secretary, KSCST Dr. K.K. Ramachandran proposed a vote of thanks.

Inaugural function was followed by technical session. In the opening presentation, Dr. Siddharth Kaul, Advisor, MoEF talked about National Wetland Conservation Programme and Ramsar Convention He also briefly talked about recently published wetland Conservation Rules which need to be executed by all States for not using wetlands beyond their carrying capacity. He wanted State Govt.'s to take up Wetland Conservation Programme in a more realistic manner particularly taking into consideration their role in-charging aquifers.

Former Executive Director of Central Water Resource Development and Management Dr. E.J. James talked about Management of River basin in relation to wise use of wetlands for sustainable development. He emphasized on interplay of social, economic, environmental and institutional factors.

Former Managing Director of Kerala Tourism Development Corporation Shri K.G. Mohanlal emphasized on role of local communities for various tourism initiatives so that negative dependence of the community develops into positive one. The coordinator wetland technical unit KSCST, Dr. P. Harinarayanan summed up and thanked all the participants for their active role in giving suggestions for conservation of wetland in the state.

SACON Celebrates World Wetlands Day 2012.

The World wetlands Day was celebrated by SACON in Coimbatore by organizing a Pre-Wetland Day conference on 24th and 25th January, 2012 followed by Ukkadam wetland visit on 2nd February, 2012. The Conference was attended by 400 individuals from different sections of the society. Several eminent speakers from organizations like WWF-India, ESG Bangalore, Salem Citizens forum, Siruthuli, Save Coimbatore Wetlands and SACON expressed their concern and ways to conserve the wetlands.

The visit to the Ukkadam wetland in Coimbatore on the 2nd February had over 50 participants. The day began by Dr. P.A. Azeez, Director SACON encouraging the participants and expressed the need for a united force to proactively conserve the wetlands. The Mayor of Coimbatore Mr. S. M. Velusamy also visited the wetland and assured the participants to take necessary measures to conserve the wetlands.

Photograph Courtesy : Mr. P. Rajan

Both the events were widely covered by the Press media.

For a detailed report visit the website: www.wetlandsofindia.org

SACON as the NGO CEPA Focal Point for India for the Ramsar Convention.

The Administrative Authority in India for the Ramsar Convention i.e. the Ministry of Environment and Forests, Government of India has nominated SACON as the NGO CEPA Focal Point for India for the Ramsar Convention.

The Focal Points act as the contacts between the Contracting Parties and the Secretariat for CEPA matters and they take the lead in implementing Resolution X.8, The Convention's programme on communication, education, participation and awareness (CEPA) 2009-2015. The Resolution identifies CEPA as a key tool for conservation and wise use of wetlands.

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