



ENVIS NEWS LETTER



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Bio Diversity

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1. INTRODUCTION

Bio Diversity – The variety of plants, animals and Eco systems in the world is a measure of our planets wealth . Bio Diversity is defined in terms of variability in genes, species and eco system. According to a comprehensive assessment of world species by World Bank, atleast 33% of all about 56,000 species assessed are threatened with extinction. In the past 100 years, atleast about 30% of the species have declined. 3125 mammal species is threatened in the world and 95 being in India. Deforestation is a major cause of loss of Bio Diversity.

Conservation efforts have focussed on protecting areas of high Bio Diversity. Bio Diversity is a comprehensive indicator which shall be used to guide the nation's Bio Diversity priorities. In India alone, about 95 mammals, 80 birds, 213 fishes and 326 higher plants are in the threatened species list. Hence, it is paramount to focus on preservation and conservation of various habitats. Simultaneously, education, creation of institutions, taking up specialised projects for conservation, creation of awareness among stakeholders, coordination and cooperation with civil societies and NGOs are essential features in achieving the objective.

Puducherry has a rich diversified habitat viz., coastal, back waters, river, sand dunes, lake, ponds and crop lands etc., Various efforts are being made for preservation and conservation of the Bio Diversity by involving all stakeholders. In this issue, an effort has been made to highlight the status of oussudu lake and the efforts that are being made to conserve and improve the habitat. The contribution of Forest Department, Government of Puducherry especially Dr. Senthil Kumar, I.F.S., Conservator of Forests and Dr. Anil Kumar, I.F.S. Deputy Conservator of Forest, Forest Department is being acknowledged bringing out this News Letter.

2. Oussudu Eri :

Puducherry is blessed with some of water bodies that have managed to retain their identity and continue to lend their services. Important among them being Oussudu, Bahour, Vadhanur, Kariamamickam, Embalam, Nettareppakkam and Sivaranthagam Eri. While all these water bodies have managed to retain their original feature, excepting Oussudu and Bahour, Both these have become seasonal over time as far as availability of water is concerned. The 'Oussudu eri' is one of the largest water bodies in Puducherry region that is also referred to as 'Ousteri'. It serves as a very important source for meeting the irrigation and drinking water needs of the town through a network of irrigation channels and supply lines. The Oussudu tank is located at a distance of around 10 kms from Puducherry on Puducherry- Villupuram- Vazhdavour stretch, the latitude being $11^{\circ}56' - 11^{\circ}58'$ and the longitude being $79^{\circ}44' - 79^{\circ}45'$.





The lake has a spread of around 800 ha, half of which falls under Vanur taluq in Villupuram district of Tamil Nadu. Its southern boundary comprises of Oussudu and Koodapakkam villages, western boundary has Ramanathapuram and Thondamanatham villages, northern boundary has Tuthipet and Karasur villages and eastern boundary abuts Tamil Nadu. The Annual mean maximum temperature of the area being 33.1°C and mean minimum being 24.1°C and the annual rainfall being 1338mm. The Oussudu lake receives water mainly from Suthukeni check dam through Suthukeni canal and the run off from the lake basin. The Suthukeni check dam is constructed across the river Sankarabharani and receives water mainly from the Veedur dam located in Villupuram district of Tamil Nadu. The combined catchment area of the tank is estimated be around 15.54 km^2 with the water storage capacity being estimated at 540 million cu feet.

The Oussudu lake supports diverse flora and fauna that is rich in rare and endemic elements. Taking into consideration the ecological, faunal, floral, geomorphological, natural and zoological significance, the Oussudu lake was declared as a Sanctuary by the Government of Puducherry in October, 2008 under the provisions of the Wild Life (Protection) Act, 1972 for the purpose of protecting, propagating and developing the sanctuary area and its environment. The lake has been identified as a wetland of national importance under the National Wetland Conservation Programme of the Ministry of Environment & Forests and an important bird area by the Bombay Natural History Society. The Asian Wetland Bureau has declared Oussudu sanctuary as one of the 93 significant wetlands in Asia. Therefore, while Oussudu lake is one of the most important fresh water lakes in Puducherry region, it is equally true that it demonstrates a complex structure comprising of water, wetland and mud flats.

3. Biodiversity of Oussudu sanctuary:

The Oussudu lake and its immediate surroundings is a veritable repository of diverse floral and faunal wealth that represent all classes of terrestrial and aquatic living organisms which have come to inhabit the water body over the years. The biodiversity of the lake can be interpreted in terms of its Floral and Faunal attributes.

3.1 Floral wealth of Oussudu sanctuary:

In the Oussudu lake and its environs, around 480 plant species belonging to 317 genera and over 92 families have been documented. Among the 480 species, herbaceous plants are dominant with 191 species followed by trees with 103 species, shrubs with 63 species, stragglers with 20 species, climbers with 40 species and grasses of 63 species are reported. In percent terms, the proportion of herbaceous plants, trees, shrubs, stragglers, climbers and grasses amount to 41, 21, 13, 4, 8 and 13 respectively. Poaceae is the dominant family with 64 species followed by Fabaceae with 30 species, Eupobiaceae, Cyperaceae, Caesalpiniaceae having respectively 28, 24 and 19 species. Cyperus is the dominant genera with 12 species followed by Cassia, Fimbristylis, Acacia, Phyllanthus and Justicia having 9, 8, 7, 7 and 5 species each. The plant wealth could further be classified into those seen in land mass and in water body.

3.1.1 Terrestrial flora :

It is distributed in the land area adjoining the water body and can be further sub classified into trees, shrubs, herbs, climbers and grasses with the predominant species in each category being listed hereunder,

Important tree species recorded:

Acacia auriculiformis, *Acacia chundra*, *Aegle marmelos*, *Azadirachta indica*, *Bombax ceiba*, *Borassus flabellifer*, *Ceiba pentandra*, *Dalbergia paniculata*, *Ficus bengalensis*, *F. religiosa*, *Gmelina arborea*, *Khaya senegalensis*, *Lannea coromandelica*, *Morinda tinctoria*, *Peltophorum pterocarpum*, *Phoenix sylvestre*, *Pongamia pinnata*, *Prosopis juliflora*, *Samanea saman*, *Spathodea companionulata*, *Syzygium cumini*, *Tamarindus indica*, *Terminalia arjuna* and *Thespesia populnea*.

Significant shrubs seen:

Abutilon hirtum, *A. indicum*, *Barleria crsitata*, *Calotropis gigantean*, *Cassia auriculata*, *Ficus hispida*, *Fluggea leucopyrus*, *Jatropha gossipyfolia*, *J. tanjorensis*, *Lantana camera*, *Phoenix laurierii*, *Randia malabarica*, *Rauvolfia tetraphylla* and *Zizuphus oenoplia*.

Major herbs:

Acalypha indica, *Alysicarpus monilifer*, *Achyranthes aspera*, *Commelina bengalensis*, *Cyperus rotundus*, *Desmodium triflorum*, *Euphorbis hirta*, *Justicia procumbens*, *Parthenium hysterophorus*, *Phyllanthus madraspatensis* and *Tridax procumbens*.

Climbers/Stragglers:

Cardiospermum halicacabum, *Cissus trifolia*, *C. vitigenea*, *Oxystelma esculentum*, *Passiflora foetida*, *Pergularia daemia*, *Tiliacora acuminata*, *Toddalia asiatica*, *Tragia involucrata*, *Tylophora benthamii*, *Wattakaka volubilis*.

Grasses:

Andropogon pumilus, *Apluda mutica*, *Arunda donax*, *Chloris barbata*, *Chrysopogon asper*, *Cyanaodon dactylon*, *Eleusine indica*, *Eragrostis amabilis*, *Saccharum spontaneum* and *Setaria pumila*.

3.1.2 Aquatic Flora of Oussudu lake:

The major hydrophytes that are found in the water body comprising the sanctuary are *Aponogeton natans*, *Ceratophyllum demersum*, *Cyperus sp.*, *Eichornia crassipes*, *Fimbristylis sp.*, *Hydrilla verticillata*, *Ipomea carnea*, *Lemna minor*, *Najas minor*, *Nelumbs nucifera*, *Ottelia allismoides*, *Polygonum glabrum*, *Pistia stratioides*, *Salvinia molesta*, *Typha angustata*, *Vallisneria spirallis* and *Vetiveria zizanioides*. Among these, *Ceratophyllum demersum*, *Hydrilla verticillata*, *Najas minor* and *Nelumbs nucifera* are the major aquatic weeds that are distributed throughout the water body with the rest mainly concentrated along the periphery.

While the floral biodiversity profile of the sanctuary area reveals its rich status as far as the plant wealth is concerned, it is very significant to mention that 11 plant species are endemic and distributed only in Indian subcontinent and includes *Andropogon pumilus*, *Asystasia dalzelliana*, *Barleria acuminata*, *Cynodon barberii*, *Dryptis roxburghii*, *Iseilema antheophoroides*, *Jatropha tanjorensis*, *Maba buxifolia*, *Phyllanthus rotundifolia*, *Sarcostemma brunonianum* and *S intermedium*. Further, out of the 480 plant species reported from the area, around 20 different species are categorized under rare/endangered/threatened/ vulnerable red listed medicinal plants that include *Acacia chundra*, *Achyranthes bidentata*, *Aegle marmelos*, *Aristolochia indica*, *Buchanania axillaris*, *Cadaba indica*, *Cassine glauca*, *Celastrus paniculatus*, *Crateva magna*, *Enicostemma littorale*, *Hemedesmus indicus*, *Hugonia mystax*, *Justicia gendarussa*, *Plumbago zeylanica*, *Salacia chinensis*, *Santalum album*, *Semecarpus anacardium* and *terminalia arjuna*.

3.2 Faunal profile of Oussudu sanctuary:3.2.1 Avi fauna :

Oussudu sanctuary is richest in terms of its diversity of birds with around 166 species of birds belonging to 47 families having been documented. This includes 75 aquatic species and 91 species being terrestrial in habit. Of the huge diversity of birds seen, as many as 120 species were found to be resident breeding and the remaining were migratory. The family Muscicapidae is the most dominant with 16 species followed by Accipitridae, Ardeidae, Anatidae having 12,11 and 10 species respectively. Some of the important found bird species include Great white Pelican, Greater flamingo, Lesser flamingo, Crested serpent eagle, White bellied sea eagle, Osprey, Bronze winged jacana, Grey headed lapwing, Chest winged cuckoo, Black capped kingfisher, Black headed oriole, Stork billed kingfisher, Rosy starling, Babblers. Oussudu sanctuary supports large populations of Cormorants, Egrets, Pond herons, Coots and Babblers. While Little egret, Asian palm swift, White headed babbler, Common myna, Jungle crow, Black drongo, House crow, White browed bulbul and bee eater are the common terrestrial birds, Little Egret, Cormorants, Spot billed pelican, Darter, Bittern, Purple heron, Night heron and grey heron, Black headed ibis are common among aquatic birds species.



The important among migratory bird species are Yellow wagtail, Marsh sandpiper, Spoon billed sandpiper, Common tern, Ruff, White headed babbler, Grey headed lapwing, Common snipe, Greenish warbler, Garganey teal, Black capped kingfisher, Osprey, Crested serpent eagle and White browed wagtail.

The Oussudu sanctuary provides shelter to some bird species like Spoon billed sandpiper that is listed as “critically endangered” and White bellied sea eagle listed as “Endangered”. Other species including Lesser flamingo, Greater flamingo, Lesser flamingo, Darter, Spot billed pelican, Black headed ibis, Eurasian spoon bill, Black bellied tern are categorized as “Near threatened” by the IUCN The Wild Life Protection Act, 1972 birds including Indian peafowl, Eurasian spoonbill, Black eagle, Black kite, Pied harrier, Osprey fall under the Schedule I which contains the species in need of maximum protection. The preceding paragraphs amply establish the richness of bird biodiversity in Oussudu sanctuary and its unique ecosystem that provide a habitat suitable for their survival and multiplication.



3.2.2 Butterflies and other faunal wealth:

The sanctuary area supports 63 butterfly species belonging to 46 genera and over 5 families. Nymphalidae is the dominant species having 21 species followed by Pieridae and Lycaenidae with 14 and 10 species respectively. Common butterfly species include Chocolate palsy, Common Jezebel, Plain tiger, Lime butterfly and Common grass yellow. Species like Crimson rose, Danaid eggfly, Common pierrot are listed in schedule I of Wild Life Protection Act. Other important categories of fauna include 10 species of amphibians and 21 species of reptiles. There are 14 species of mammals that include Spotted deer, Jackal, Jungle cat, Mongoose, Hare, Porcupine, Palm civet and Indian pangolin.

4. Ecosystem services of Oussudu sanctuary:

The Oussudu sanctuary is an important eco hotspot that serves to provide several direct and indirect livelihood resources and services in terms of water for irrigation, drinking and industrial usage. It plays a major role in recharge of ground water level besides serving as a rich source of fresh water fish, fodder and grass. More importantly, it is one of the significant aesthetic, educational and recreational spot in Puducherry. The Oussudu sanctuary in Puducherry represent a typical wetland ecosystem that not only supports a rich bio diversity but has several intangible services in terms of regulation of climate, water, erosion control and management of natural hazards. The Oussudu sanctuary being located amidst a highly urbanized and ever expanding development milieu is under anthropogenic pressures at various levels that have resulted in exploitation of its resources. Incidences of poaching of wild life, unsustainable fishing, uncontrolled weed growth, inflow of agro chemicals from nearby fields, soil erosion, siltation, pollution caused by vehicular movement and unregulated tourism activities tend to exert excessive pressure on the fragile eco system causing an ecological imbalance that in turn adversely affects the health of the water body.

5. Comprehensive Management Action Plan of Oussudu sanctuary:

Taking into account the fact that Oussudu sanctuary is a pioneer as far as protected areas in the UT are concerned and bearing in mind the requirement of ensuring that its status as a biodiversity hotspot remains unaffected, the Government of Puducherry has put in place a Comprehensive Management Action Plan for the sanctuary that aims at not only initiating measures for preserving its biodiversity richness but also to ensure its sustainable development. The CMAP has been submitted to the Ministry of Environment & Forests and following its acceptance, it is expected that a joint monitoring agency comprising representatives of Puducherry and Tamil Nadu shall initiate measures for implementing the plan in a coordinated manner. Steps are also afoot to declare an extent of 100 metres around the sanctuary area as Eco sensitive zone under the provisions of Environment (Protection) Act for regulating the activities in the vicinity of the protected area and ensuring its long term health. The total outlay proposed under the CMAP to be implemented over a period of 5 years is 5.46 crores.



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