

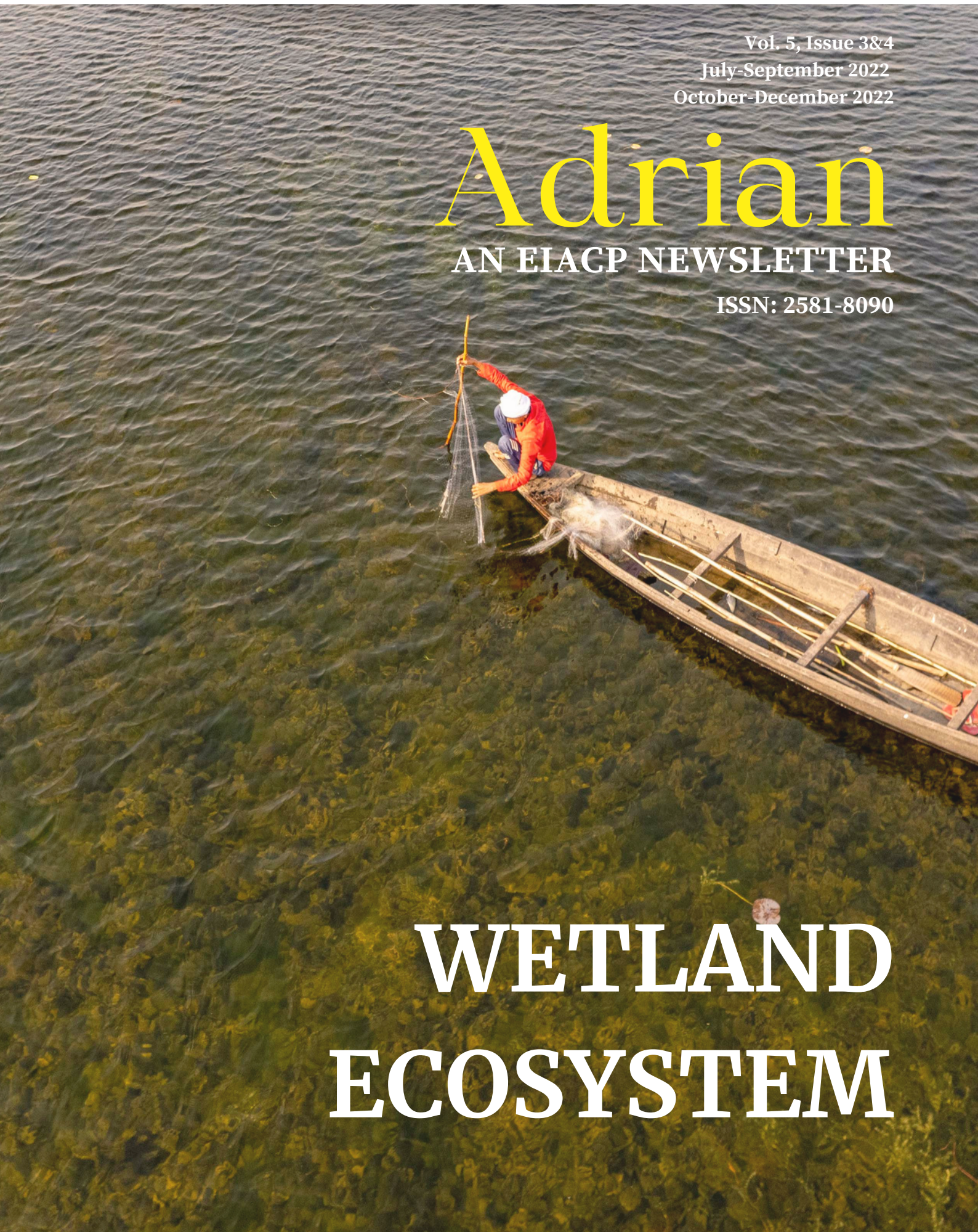


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Declining Mangrove Cover of Vembanad-Kol Wetland Ecosystem

Megha S Vinod, Mogalekar H.S., S.K. Nayak & P.P. Srivastava

Introduction

Vembanad-Kol Wetland (**Fig. 1**) is the largest brackish, humid tropical wetland ecosystem on the southwest coast of India, fed by 10 rivers, renowned for its clams and waterfowl population. It has been designated as a Wetland of International Importance (Ramsar Site) in 2002. It offers flood protection for thickly-populated coastal areas of three districts of Kerala and supplies water for agriculture, besides other ecosystem services. The soft, organically rich sedimentary substrata of the in-shore region are an ideal habitat for shrimps. The estuarine zone plays a key role in the life cycle of many shrimps caught, and the entire Vembanad Kol acts as a nursery for important shrimp-like *Penaeus indicus*, *P.monodon*, *Metapenaeus dobsoni*, *M. monoceros*, *M. affinis*, *Macrobrachium rosenbergii* etc. In a time when the world is in search of a suitable protein source to be incorporated into their daily ration with population explosion on the flip side, the Indian economy capable of providing the most preferred healthy delicacy losing its resources to self-made disasters is sad, especially when it comes to commercially important species like shrimp. Therefore re-establishment of such crucial ecosystems stands vital and very important.

Due to mismanagement, we have lost an ample area of Vembanad-Kol wetland, and the area has shrunk from 365 square kilometres in 1834 to around 179.25 square kilometres in 2010, reflecting the need for emergency revival of the ecosystem (Asha et al., 2014; Ganesh et al., 2020).



Fig. 1: Vembanad-Kol Wetland (Source: Shutterstock)

Emerging threats and their impacts

Swaminathan Commission report mentions that nearly 23 species of fish had gone extinct (Krishnakumar & Priyadarsanan, 2012; Krishnakumar et al., 2008) when the water body shrunk and that the reason for this has been stated as habitat alteration for agricultural activities, overexploitation of resources through unmanaged fisheries and unsustainable fishing practices using destructive fishing practices and nets, pollution and exotic species introduction (Padmakumar et al. 2001, Krishnakumar et al. 2008, Krishnakumar et al. 2011; Krishnakumar & Priyadarsanan, 2012). Catfishes, Cyprinids, and Crustaceans comprise the maximum of the wetland's rich resources. Seabass and Mulletts have declined dramatically since the construction of Thaneermukom Barrage. Analysis of fish stock decline suggests that 86% of these are migratory species and that the Thaneermukom barrage prevents their entry into the lake (Krishnakumar et al., 2008). Thottapally spillway also contributes to changing the physic-chemical conditions of the lake affecting the dwelling and propagation of migratory species, which resulted in their decline and even extinction.

Lack of proper consideration and unscientific and inhumane acts from both government and communities has led to an apparent deterioration of the wetland. As per reports (Source: Report prepared by Wetlands International – South Asia for International Union for Conservation of Nature and Ministry of Environment and Forests, Government of India under Mangroves for the Future – India initiative), till the 19th century, the anthropogenic threats were minimal. The establishment of Cochin Port in 1838 catalyzed the beginning of economic activities in this region. In addition, the large-scale reclamation of fertile floodplains, conversion of wetland regions and marshes into polders for agriculture, construction of spillways for preventing seawater intrusion and tidal control like the building of Thaneermukom Barrage, the establishment of Udyogmandal Industrial belt, clearance of thick mangrove forest for accommodating backwater tourism facilities, for instance, the Baker estate in Kumarakom which is the longest mangrove cover in Kerala was felled for Kerala Tourism Development Center Complex, have all led to massive destruction and degradation (Narayanan & Chourey, 2020).

The impacts of all such activities are seen evidently with the changed hydrological regime, like the reduction in water holding capacity by a factor of 77% (Narayanan & Chourey, 2020; Remani et al., 2010). Further, change in flushing patterns, pollution, the spread of invasive water hyacinth due to excessive mineral enrichment of water as a result of sewage and industrial effluent inflow, and changes in natural salinity gradient led to the decline of

brackish water, and marine fish and shellfish catch and subsequent reduction in rice production are other severe after effects.

Remedial Measures

Despite such sufferings, a suitable management intervention has not yet been put forward by the Government. Most of the development works carried out either in the wetland or upstream have been isolated activities and, therefore, are unsustainable. An integrated management plan is essential for better conservation and management of the system. An immediate step in conservation is the need of the hour. Even though many governmental policies and laws like National Environment Policy (2006), The Wetland Conservation and Management Rules (2010) state to protect the wetlands, but essential steps are not taken. Henceforth, through this article, certain remedial measures are suggested. These steps are aimed at a participatory approach where the local stakeholders are made an important component in the conservation strategy. The people who know the resource also will know ways to protect them. Hence their role is highly acclamable. Also, rather than only focusing on the prevention of atrocities, it is time to give importance to reviewing and monitoring, ensuring every moment that the action plan is working. Revitalizing and rejuvenating the damaged ecosystem, proper management interventions, proper resource allocation, and imposing strict rules and regulations in case of any violation can surely bring forth changes but can only bring fruitful results if a regular check of compliance is done. Integration of traditional know-how into scientific principles can do wonders. Modern cultivation techniques like cage culture and pen culture can be adopted while also incorporating sanctuaries for the protection of endangered species. Thaneermukom barrage, which is stated as a serious threat, has to be kept open for a major part of the year for necessary saline water intrusion. Increasing awareness among farmers, afforestation, soil and water conservation, closure of worst-hit areas for natural ecosystem restoration (Remani et al., 2010), and ranching of endangered species are other useful measures.

Author Brief

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Anthropogenic Impact on Indian Wetlands: A Threat to the most Productive Living Ecosystem on Earth

Akriti Ashesh and Ningombam Linthoingambi Devi

Overview of Indian Wetlands

India has 1243 wetlands sites of ecological significance, amongst which 75 wetlands have been designated as ‘Ramsar’ sites, covering around 1.3 million hectares of the total geographical area under ‘Wetlands of International Importance’.¹ India has the second-highest number of Ramsar sites after Spain, which has 76 such sites in the country. Wetlands provide habitats to a wide variety of resident as well as migratory bird species, which is one of the significant indicators under the Ramsar convention.

According to IUCN², wetlands provide a suitable environment for feeding and breeding and as a place to refuel and rest during migrations of several bird species, including rare, endangered, near threatened and threatened species. Moreover, it also supports communities residing around the wetlands by fulfilling water demand for agriculture, drinking and fishing culture as alternative livelihood opportunities (Bhatt et al., 2016). Wetlands perform a myriad of functions and are a source of numerous ecosystem services. Nutrient cycling, food supply, maintaining water table, recharge groundwater, natural flood buffer, acting as sediment and nutrient sink, recreation and tourism zone, and the list could go long. Even due to serious anthropogenic pressure on such diverse aqua-ecological systems, many wetlands are at risk of drying and degradation of their supporting biodiversity. Other factors like changes in seasonal variability, siltation, sedimentation, soil erosion, weed invasion, nutrient accumulation, willow plantations, pesticide pollution, bird poaching, overharvesting of fishes, littered garbage, unregulated tourism, etc. are also causing serious threats to the active wetlands ecosystem.

Wetland degradation can be characterized as a phenomenon triggering a drastic change in the natural functioning of its hydrology, geomorphology, and biodiversity. It is induced generally due to agricultural conversion, deforestation, feeding channel diversion or encroachment, defoliation, water quality degradation, spread of invasive species, etc. The encroachment of wet areas due to silt deposits forms acute loss, whereas the gradual elimination of biological diversity, soil erosion, and sedimentation of the wetlands over several decades causes chronic

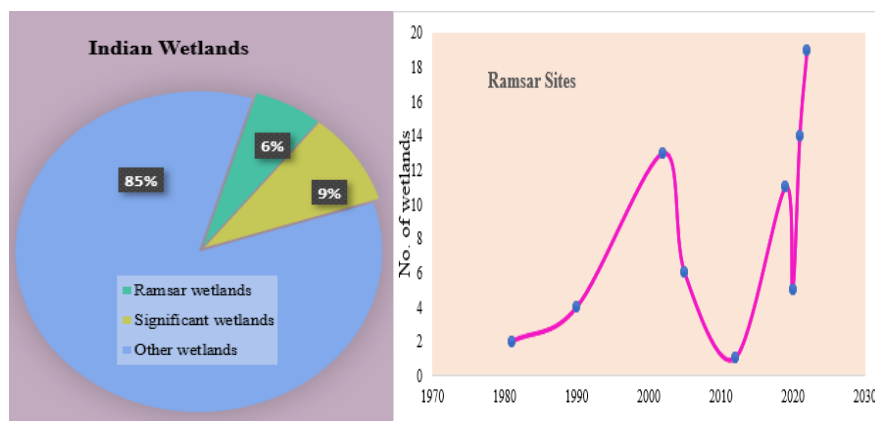
¹ Wetlands India Portal, Government of India: <https://indianwetlands.in/>

² International Union for Conservation of Nature (IUCN): <https://www.iucn.org/>

loss. Wetlands are functional for all seasons. During rainfall, it acts as a natural flood buffer, securing water for irrigation and fish culture purposes even during dry seasons.

India has a large number of inland wetlands due to its diverse regimes in climatic conditions. It accounts for 43% and 30% of natural and manmade inland wetlands, respectively (Shan et al., 2021). The resources from inland wetlands provide livelihood and nutritional benefits for socio-economic development. Along with fish, some aquatic and moderately aquatic products such as lotus, foxnut, chestnut, and lily also provide alternative sources of livelihood. Despite being a major source of livelihood for a large fraction of the population, there is a dearth of data on the production and consumption of wetland products.

The increase in population and the resultant demands have put tremendous pressure on the wetland ecosystem and its services. Over time, the exploitation of natural resources has eventually led to a decline in fish diversity and production in the wetlands. For instance, wetlands such as Bharatpur bird sanctuary and Bhindawas Bird Sanctuary were forced to alter community structure due to alterations in hydrological conditions. Similarly, Bellandur lake (Bengaluru) is suffering from high industrial effluent, which has damaged the natural functioning of the wetland hydrology, Kakki reservoir (Kerala) was threatened by invasive species such as salvinia, and Tsomoriri Lake of Ladakh is disturbed due to alteration in climatic conditions (more examples in Table 1).



(a)

(b)

Figure 2. Wetlands in India (a) classification (b) increased trends in number.
(source: indianwetlands.in; <https://ramsar.org/>)

Table 1: Reported cause of wetland degradation around India

| Wetland | Location | Reported status | Reason for degradation | References |
|--------------------------|--------------------------|---|---|-------------------------|
| Bellandur lake | Bengaluru | Eutrophication prevails | Industrial effluents discharge | Shan et al., 2021 |
| Bharatpur bird sanctuary | Rajasthan | Decline biodiversity (migratory birds) | Hydrological alteration | Haritash et al., 2015 |
| Chatra Wetland | Kolkata | Reported: significant deterioration in quality since past 18 years | Land use land cover transformations due to urban agglomeration | Das & Basu 2020 |
| Deepor Beel Wetland | Assam | Shrinkage of wetlands length, highly sedimented and overexploited | Weed infestations and siltation | Sarkar & Borah 2018 |
| Hariya chaur | Jandaha, Vaishali, Bihar | Decline in fish production | Overexploitation | Pankaj & Hassan 2014 |
| Kabar tal wetland | Begusarai, Bihar | Increase in agriculture and fallow land | Unplanned intensive agriculture activities, population pressure | Ranjan & Kumari 2018 |
| Kakki Reservoir | Kerala | Loss of large number of native plant and animal species, invasion by salvinia | Weed infestation | Shan et al., 2021 |
| Keolado National Park | Bharatpur, Rajasthan | Adversely affected and sensitive to drought | Climate change, water supply, pollution, urbanization, grazing | Chaterjee et al., 2015 |
| Kolleru lake | Andhra Pradesh | Transformation of natural wetlands to agricultural land | Agricultural activities | Shan et al., 2021 |
| Loktak Lake | Manipur | Decline in fish population, degradation of productivity, & biodiversity. | Human activities | Singh & Kundrakpam 2012 |
| Motapung Beel Wetland | Assam | Decrease in fish stocks, fodder, thatch, and tourism | Overexploitation & siltation | Bhatta et al., 2016 |
| Sakari Chaur | Vaishali, Bihar | Degraded water quality | Urbanization | Pankaj et al., 2015 |
| Bramhapura Maun | Muzaffarpur, Bihar | Decline in ecosystem service | Urban agglomeration | Kumar et al., 2013 |
| Tsomoriri Lake | Laddakh | Risen water level, migratory birds on the verge of extinction | Climate change | Shan et al., 2021 |
| Varthur Lake | Bengaluru | Loss in economic value, degraded water quality | Sewage outfall | Ramchandra et al., 2011 |

The assessments of degraded wetlands due to urban pressures are limited because of the unavailability of documented data. The quantitative report on wetland commercialization is missing from state data. Community awareness in the field of wetland conservation would increase its sustainable use and subsequently decrease the pressure. Attention needs to be shifted towards the direct and indirect drivers of degradation in the wetlands ecosystem. An explicit interpretation of wetland loss due to various anthropogenic pressure would need a comprehensive understanding of wetland features and the affected area, threats, and plausible mitigation measures.

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Case Study

Avifauna of Mustafapur Wetland, Bihar

Md Shahbaz, Ahbar Alam, Shahla Yasmin

Introduction

Mustafapur wetland (25.59341°N and 85.040778°E) is located on the outskirts of Patna. It has an area of 140 m² and a perimeter of 1710 m (**Fig 3**). Rainwater is the only source of water in this area. Mustafapur, once known for Trapa cultivation, is now being converted into a residential area. Most of its area is fragmented into several small wetlands. These areas provide shelter and food to different bird species. No data pertaining to the avifauna of this region is available. Therefore, it was decided to prepare a checklist of birds of this wetland.



Fig 3. Map showing Mustafapur Wetland

Methods

The survey was conducted between November 2021 to February 2022 on a weekly basis from 7.30 am to 10.30 am. The average temperature was around 25-18°C, with the lowest dip in temperature recorded as 7°C. Bird species were recorded by using the point count method. Birds were recorded and identified by direct sightings as well as on the basis of calls.

Results

The tree species found in the Mustafapur wetland were *Ficus racemosa* and *Ficus religiosa*. Herbaceous vegetation: *Cymbopogon martinii*, *Brachiara mutica*, *Pennisetum purpureum*, *Imperata cylindrica*, *Hymenachne amplexicaulis*, *Setaria viridis*, *Arundo donax*, *Phragmites karka*, *Phragmites australis*, *Typha domingensis* and *Actinoscirpus grossus*. Aquatic flora includes *Pistia stratiotes*, *Eichhornia crassipes*, *Nymphaea micrantha*, *Vallisneria natans*, *Spirodela polyrhiza*, *Limnocharis flava*, *Hydrilla verticillata*, *Monochoria vaginalis*, *Azolla pinnata*, *Ottelia alismoides*, *Salvinia natans*, *Eclipta prostrata*, *Lemna minor*, *Alternanthera philoxeroides*, *Elodea najas*, *Polygonum plebeium*, *Enydra fluctuans* and *Marsilea minuta*.

A total number of 67 species of birds were recorded, out of which 10 were migratory (Table 2). The recorded species were classified into 15 orders and 29 families. The most dominant order was Passeriformes having 24 species, followed by Anseriformes, with 7 species, Pelicaniformes with 7 species, Charadriiformes with 6 species, Columbiformes with 4 species, Gruiformes with 4 species, Accipitriformes with 3 species, Coraciiformes with 3 species, Cuculiformes with 2 species, Psittaciformes with 2 species, Suliformes with 2 species, Apodiformes, Podicipediformes, Ciconiiformes and Piciformes each with only a single species. Lesser whistling duck (*Dendrocygna javanica*) was observed to be the most abundant, followed by Gadwall (*Mareca strepera*), Asian openbill stork (*Anastomus oscitans*) Jacanas and other rails. Western Marsh harrier (*Circus aeruginosus*) and Cinnamon bittern (*Ixobrychus cinnamomeus*) were the rare observations in this region. The above findings provide baseline data for future work. Unfortunately, the water bodies of Patna are being filled up fast for the construction of multistorey buildings. This will deprive the water birds of their safe home.

Table 2. Checklist of birds of Mustafapur Wetland, Patna.

| SNo | Common Name | Scientific name | IUCN status | Migratory status |
|-----|-----------------------|-----------------------------|-------------|------------------|
| 1 | Gadwall | <i>Mareca strepera</i> | LC | WM |
| 2 | Garganey | <i>Spatula querquedula</i> | LC | WM |
| 3 | Lesser whistling teal | <i>Dendrocygna javanica</i> | LC | R |
| 4 | Red-crested pochard | <i>Netta rufina</i> | LC | WM |
| 5 | Northern pintail | <i>Anas acuta</i> | LC | WM |
| 6 | Northern shoveler | <i>Spatula clypeata</i> | LC | WM |
| 7 | Eurasian wigeon | <i>Mareca penelope</i> | LC | WM |

| | | | | |
|----|---------------------------|----------------------------------|----|----|
| 8 | Rufescent Prinia | <i>Prinia rufescens</i> | LC | R |
| 9 | Ashy Prinia | <i>Prinia socialis</i> | LC | R |
| 10 | Plain Prinia | <i>Prinia inornate</i> | LC | R |
| 11 | Common tailorbird | <i>Orthotomus sutorius</i> | LC | R |
| 12 | Zitting cisticola | <i>Cisticola juncidis</i> | LC | R |
| 13 | Citrine Wagtail | <i>Motacilla citreola</i> | LC | WM |
| 14 | White-browed Wagtail | <i>Motacilla maderaspatensis</i> | LC | R |
| 15 | White wagtail | <i>Motacilla alba</i> | LC | WM |
| 16 | Rosy Pipit | <i>Anthus roseatus</i> | LC | R |
| 17 | Brown rock chat | <i>Oenanthe fusca</i> | LC | R |
| 18 | Oriental magpie robin | <i>Copsychus saularis</i> | LC | R |
| 19 | Red-vented bulbul | <i>Pycnonotus cafer</i> | LC | R |
| 20 | Purple sunbird | <i>Cinnyris asiaticus</i> | LC | R |
| 21 | Black drongo | <i>Dicrurus macrocercus</i> | LC | R |
| 22 | Jungle babbler | <i>Argya striata</i> | LC | R |
| 23 | Barn swallow | <i>Hirundo rustica</i> | LC | R |
| 24 | Large-billed crow | <i>Corvus macrorhynchos</i> | LC | R |
| 25 | House crow | <i>Corvus splendens</i> | LC | R |
| 26 | Rufous treepie | <i>Dendrocitta vagabunda</i> | LC | R |
| 27 | Common myna | <i>Acridotheres tristis</i> | LC | R |
| 28 | Indian pied myna | <i>Gracupica contra</i> | LC | R |
| 29 | Bank myna | <i>Acridotheres ginginianus</i> | LC | R |
| 30 | House sparrow | <i>Passer domesticus</i> | LC | R |
| 31 | Cattle egret | <i>Bubulcus ibis</i> | LC | R |
| 32 | Little egret | <i>Egretta garzetta</i> | LC | R |
| 33 | Great egret | <i>Ardea alba</i> | LC | R |
| 34 | Purple heron | <i>Ardea purpurea</i> | LC | R |
| 35 | Indian pond heron | <i>Ardeola grayii</i> | LC | R |
| 36 | Black-crowned night heron | <i>Nycticorax nycticorax</i> | LC | R |
| 37 | Cinnamon bittern | <i>Ixobrychus cinnamomeus</i> | LC | R |
| 38 | Black kite | <i>Milvus migrans</i> | LC | R |
| 39 | Western marsh harrier | <i>Circus aeruginosus</i> | LC | WM |
| 40 | Shikra | <i>Accipiter badius</i> | LC | R |
| 41 | Eurasian collared dove | <i>Streptopelia decaocto</i> | LC | R |
| 42 | Spotted dove | <i>Spilopelia chinensis</i> | LC | R |
| 43 | Laughing dove | <i>Spilopelia senegalensis</i> | LC | R |
| 44 | Feral pigeon | <i>Columba livia domestica</i> | LC | R |
| 45 | Red-wattled lapwing | <i>Vanellus indicus</i> | LC | R |
| 46 | Grey-headed lapwing | <i>Vanellus cinereus</i> | LC | R |
| 47 | Wood sandpiper | <i>Tringa glareola</i> | LC | R |
| 48 | Common Sandpiper | <i>Actitis hypoleucos</i> | LC | WM |
| 49 | Bronze-winged jacana | <i>Metopidius indicus</i> | LC | R |
| 50 | Pheasant-tailed jacana | <i>Hydrophasianus chirurgus</i> | LC | R |
| 51 | Grey-headed Swamphen | <i>Porphyrio poliocephalus</i> | LC | R |
| 52 | Common moorhen | <i>Gallinula chloropus</i> | LC | R |
| 53 | Eurasian coot | <i>Fulica atra</i> | LC | R |

| | | | | |
|----|---------------------------|----------------------------------|----|---|
| 54 | White-breasted waterhen | <i>Amaurornis phoenicurus</i> | LC | R |
| 55 | Asian koel | <i>Eudynamis scolopaceus</i> | LC | R |
| 56 | Greater coucal | <i>Centropus sinensis</i> | LC | R |
| 57 | Plum-headed parakeet | <i>Psittacula cyanocephala</i> | LC | R |
| 58 | Rose-ringed parakeet | <i>Psittacula krameri</i> | LC | R |
| 59 | Indian cormorant | <i>Phalacrocorax fuscicollis</i> | LC | R |
| 60 | little cormorant | <i>Microcarbo niger</i> | LC | R |
| 61 | White-throated Kingfisher | <i>Halcyon smyrnensis</i> | LC | R |
| 62 | Asian green bee-eater | <i>Merops orientalis</i> | LC | R |
| 63 | Indian roller | <i>Coracias benghalensis</i> | LC | R |
| 64 | Asian openbill stork | <i>Anastomus oscitans</i> | LC | R |
| 65 | Little grebe | <i>Tachybaptus ruficollis</i> | LC | R |
| 66 | Asian palm swift | <i>Cypsiurus balasiensis</i> | LC | R |
| 67 | Coppersmith barbet | <i>Psilopogon haemacephalus</i> | LC | R |

Acronyms- **R**= Resident, **WM**= Winter Migrant, **SM**= Summer Migrant, **LC**= Least Concern.

Author Brief

Professor Shahla Yasmin is presently heading the Department of Zoology at Patna University. She has documented the birds found in Patna Women's College and in the fort area of Aligarh. She has also conducted a comparative study of doves and the ecology of peafowl in the Aligarh region.

Ahbar Alam has completed MSc in Environmental Science and Management from Patna University. He has also documented the birds found along the Ganges in Patna.

Mohammad Shahbaz has completed his MSc in Environmental Science and Management from Patna University. He has also documented the birds of Rajdhani Jalashay, Patna. Presently, he is documenting the biodiversity of the Patna Science College campus.

In Spotlight



Bihar government to make health cards for 133 wetlands

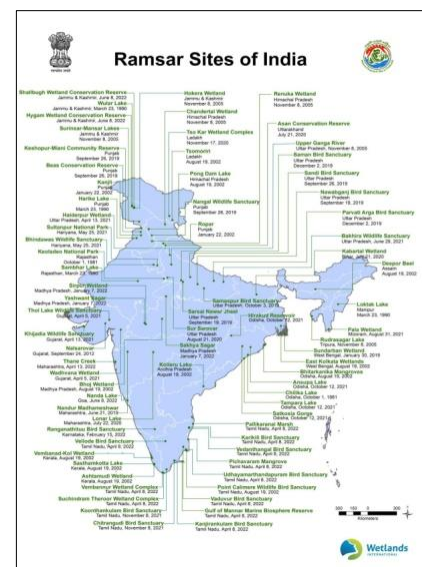
15 Jun 2022: In its first attempt to map the wetlands of Bihar, the state department of the environment, forest and climate change (DEFCC) has identified 133 water bodies to document and develop an ‘ecosystem health report card’ to provide them legal protection under the Wetland Protection Rules. The Bihar State Wetland Authority (BSWA) has started the survey work on the wetlands

spread over more than 100 hectares with a focus on three areas – the delineation of the wetland, hydrology and catchments, and biodiversity and governance. The spatial mapping of such wetlands has been done with the help of the Indian Space Research Organization (ISRO). The wetlands will be examined in different phases by forest officials, environmentalists, and wetland and water experts.

Read more: <http://bswa.bihar.gov.in/Download.aspx>

75 Ramsar Sites in 75th Year of Independence

13 Aug 2022: To commemorate the 75th year of Independence, India has added 11 more wetlands to the list of Ramsar sites, taking the final tally to 75. The total area protected under the Ramsar convention has gone up to 13,26,677 ha. The 11 new sites include Four (4) sites in Tamil Nadu, Three (3) in Odisha, Two (2) in Jammu & Kashmir and One (1) each in Madhya Pradesh and Maharashtra. Designation of these sites as Ramsar sites would help in the conservation and management of wetlands and the wise use of their resources. During this year itself (2022), a total of 28 wetlands have been declared as Ramsar sites. Based on the date of



designation mentioned on the Ramsar Certificate, the number is 19 for this year (2022) and 14 for the previous year (2021). Tamil Nadu has the maximum number of Ramsar sites (14 nos), followed by UP which has a total of 10 Ramsar sites. Detailed list is shown in **Table 3**.

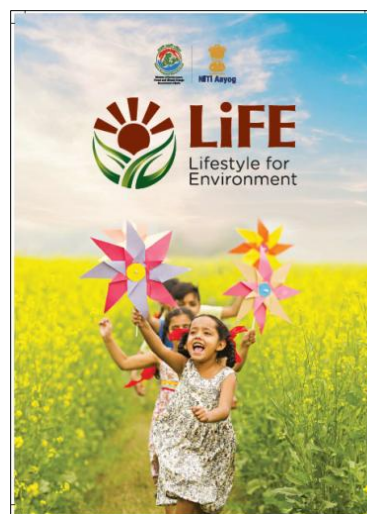
Read more: <https://pib.gov.in/PressReleasePage.aspx?PRID=1851484>

Mission LiFE- Lifestyle for Environment Launched By Hon'ble Prime Minister

20 Oct 2022: Prime Minister Shri Narendra Modi launched Mission LiFE (Lifestyle for Environment) on October 20, 2022. Mission LiFE is an India-led global mass movement to nudge individual and community action to transition towards “mindful and deliberate utilization, instead of mindless and destructive consumption.” Mission LiFE seeks to translate the vision of LiFE into measurable impact.

Mission Objectives:

- Mission LiFE seeks to translate the vision of LiFE into measurable impact.
- Mission LiFE is designed with the objective to mobilise at least one billion Indians and other global citizens to take individual and collective action for protecting and preserving the environment in the period 2022 to 2027.
- Within India, at least 80% of all villages and urban local bodies are aimed to become environment-friendly by 2028.
- It aims to nudge individuals and communities to practise a lifestyle that is synchronous with nature and does not harm it. Those who practice such a lifestyle are recognised as ‘Pro Planet People’.



To access the document, click on the link: <https://www.niti.gov.in/sites/default/files/2022-10/Brochure-10-pages-op-2-print-file-20102022.pdf>.

Read more: <https://pib.gov.in/PressReleasePage.aspx?PRID=1869466>

Ban on Single Use Plastics

12 December 2022: The Plastic Waste Management Rules, 2016, provides the statutory framework and the prescribed authorities for enforcement of the rules, including ban on identified single use plastic items. The following identified single use plastic items, which have low utility and high littering potential, have been prohibited, with effect from **1st July, 2022**, vide Plastic Waste Management Amendment Rules, 2021:



- Ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice- cream sticks, polystyrene [Thermocol] for decoration;
- Plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers.

The notification also prohibits manufacture, import, stocking, distribution, sale and use of plastic carry bags having thickness less than seventy-five microns with effect from 30th September 2021, and having thickness less than **thickness of one hundred and twenty microns with effect from the 31st December, 2022.**

States and UTs have also been asked to undertake random checking at border checkpoints to stop inter-state movement of banned single use plastic items. Special pan India enforcement drives have been undertaken in months of October and November, by Central Pollution Control Board, State Pollution Control Boards and Pollution Control Committees.

Read More:

<https://pib.gov.in/PressReleasePage.aspx?PRID=1882855#:~:text=The%20Plastic%20Waste%20Management%20Rules,identified%20single%20use%20plastic%20items>

Mission Amrit Sarovar

20 Dec 2022: Mission Amrit Sarovar had initially planned a target to construct or rejuvenate 50,000 Amrit Sarovar ponds across India till 15th August 2023. Now, additional 50,000 Amrit Sarovar ponds will be constructed by 15th August 2023. The State Governments have identified sites for constructing Amrit Sarovar in the country. As of 14.12.2022, the construction work has been started on 53,050



sites. The sites on which construction will start soon are 38,503. The Government has created a portal to capture all the activities taking place under the mission. The details of the identified sites, works commenced, and works completed may be seen through the following link: <https://amritsarovar.gov.in/login>. Every Amrit Sarovar will have a pondage area of 1 acre with a water holding capacity of about 10,000 cubic meters. This mission will go a long way in improving water resource availability in the country and is likely to become one of the key deterrents against the threats of climate change.

Read More: <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1885211>

Table 3. State-wise list of Wetlands identified as Ramsar Sites in India (75)

| S.No | States | District | No. of Ramsar Sites | Name of Ramsar Site |
|------|------------------|----------------------|---------------------|--|
| 1 | Andhra Pradesh | Eluru | 1 | Kolleru Lake |
| 2 | Assam | Kamrup | 1 | Deepor Beel |
| 3 | Bihar | Begusarai | 1 | Kabartal Wetland |
| 4 | Goa | South Goa | 1 | Nanda Lake |
| 5 | Gujarat | Jamnagar | 4 | Khijadia Wildlife Sanctuary |
| | | Ahmedabad | | Nalsarovar Bird Sanctuary |
| | | Ahmedabad | | Thol Lake Wildlife Sanctuary |
| | | Vadodara | | Wadhvana Wetland |
| 6 | Haryana | Jhajjar | 2 | Bhindawas Wildlife Sanctuary |
| | | Gurugram | | Sultanpur National Park |
| 7 | Himachal Pradesh | Lahul and Spiti | 3 | Chandertal Wetland |
| | | Kangra | | Pong Dam Lake |
| | | Sirmaur | | Renuka Wetland |
| 8 | Jammu & Kashmir | Bandipora | 5 | Wular Lake |
| | | Srinagar | | Hokera Wetland |
| | | Jammu | | Surinsar-Mansar Lakes |
| | | Baramulla | | Hygam Wetland Conservation Reserve |
| | | Srinagar | | Shallbugh Wetland Conservation Reserve |
| 9 | Karnataka | Mandya | 1 | Ranganathittu Bird Sanctuary |
| 10 | Kerala | Kollam | 3 | Asthamudi Wetland |
| | | Kollam | | Sasthamkotta Lake |
| | | Alappuzha, Kottayam, | | Vembanad-Kol Wetland |

| | | | | |
|----|----------------|---|---|--|
| | | Ernakulam and Thrissur | | |
| 11 | Ladakh | Leh | 2 | Tso Kar Wetland Complex Tsomoriri Lake |
| 12 | Madhya Pradesh | Bhopal Shivpuri Indore Indore | 4 | Bhoj Wetlands Sakhya Sagar Sirpur wetland Yashwant Sagar |
| 13 | Maharashtra | Buldhana Nashik Mumbai | 3 | Lonar Lake NandurMadhameshwar Thane Creek |
| 14 | Manipur | Bishnupur | 1 | Loktak Lake |
| 15 | Mizoram | Saiha | 1 | Pala wetland |
| 16 | Orissa | Kendrapara Ganjam Nayagarh Ganjam Sambalpur Cuttack | 6 | Bhitarkanika Mangroves Chilka Lake Satkosia Gorge Tampara Lake Hirakud Reservoir Ansupa Lake |
| 17 | Punjab | Ferozepur Kapurthala Gurdaspur Rupnagar Rupnagar and Nawanshahr | 6 | Beas Conservation Reserve Harike Lake Kanjli Lake Keshopur-Miani Community Reserve Nangal Wildlife Sanctuary Ropar Lake |
| 18 | Rajasthan | Bharatpur Jaipur | 2 | Keoladeo Ghana NP Sambhar Lake |

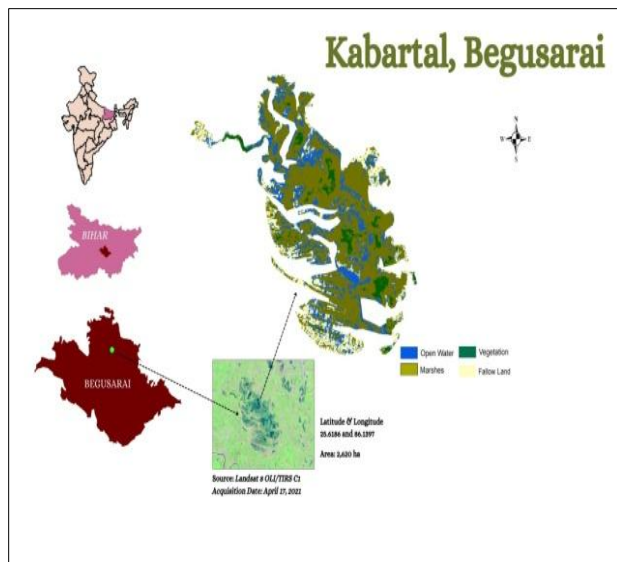
| | | | | |
|----|---------------|-----------------------------|----|--|
| 19 | Tamil Nadu | Nagapattinam | 14 | Point Calimere Wildlife and Bird Sanctuary |
| | | Kanchipuram | | Karikili Bird Sanctuary |
| | | Chennai and Chengalpattu | | Pallikaranai Marsh Reserve Forest |
| | | Cuddalore | | Pichavaram Mangrove |
| | | Tirunelveli | | Koonthankulam Bird Sanctuary |
| | | Toothukudi & Ramanathapuram | | Gulf of Mannar Marine Biosphere Reserve |
| | | Kanyakumari | | Vembannur Wetland Complex |
| | | Erode | | Vellode Bird Sanctuary |
| | | Kancheepuram | | Vedanthangal Bird Sanctuary |
| | | Thiruvarur | | Udhayamarthandapuram Bird Sanctuary |
| | | Ramanathapuram | | Chitragudi Bird Sanctuary |
| | | Kanyakumari | | SuchindramTheroor Wetland Complex |
| | | Tiruvarur | | Vaduvur Bird Sanctuary |
| | | Ramanathapuram | | Kanjirankulam Bird Sanctuary |
| 20 | Tripura | Sipahijala | 1 | Rudrasagar Lake |
| 21 | Uttar Pradesh | Sant Kabir Nagar | 10 | Bakhira Wildlife Sanctuary |
| | | Raebareli | | Haiderpur Wetland |
| | | Unnao | | Nawabganj Bird Sanctuary |
| | | Gonda | | Parvati Agra Bird Sanctuary |
| | | Mainpuri | | Saman Bird Sanctuary |
| | | Raebareli | | Samaspur Bird Sanctuary |

| | | | | |
|----|-------------|---------------------------|---|--|
| | | Hardoi | | Sandi Bird Sanctuary |
| | | Etawah | | Sarsai Nawar Jheel |
| | | Agra | | Sur Sarovar |
| | | Fatehgarh | | Upper Ganga River (Brijghat to Narora Stretch) |
| 22 | Uttarakhand | Dehradun | 1 | Asan Conservation Reserve |
| 23 | West Bengal | 24 Parganas North & South | 2 | East Kolkata Wetlands |
| | | 24 Parganas South | | Sunderbans Wetland |

Source: <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/aug/doc202282696401.pdf>

Knowledge Outcomes

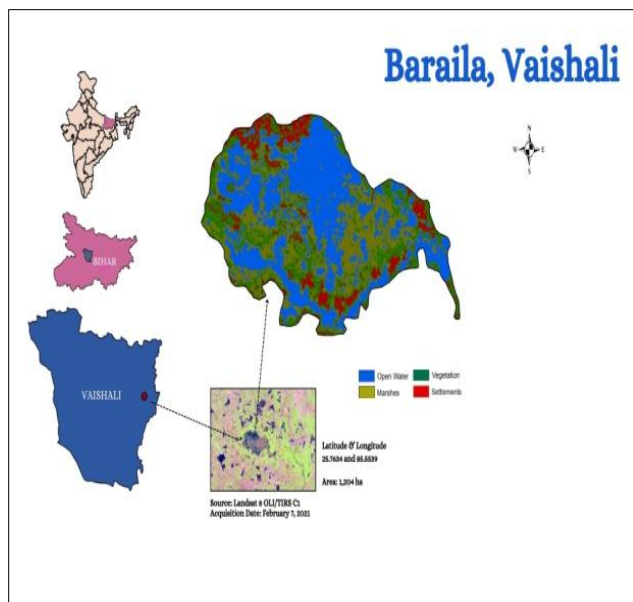
Important Wetlands of Bihar



Map 1: Kabartal Lake (Ramsar Site), Bihar

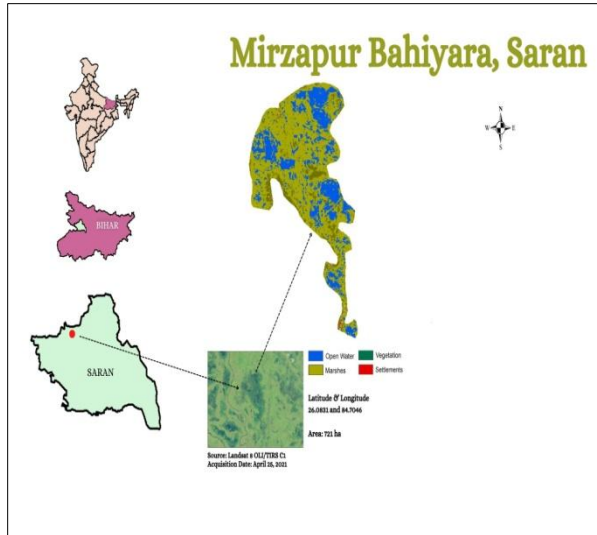
Wetland Type: Asia's largest ox-bow lake, **Location & Area:** Begusarai (25.61860278 and 86.13974722) & 2,620 ha, **River Basin:** Gangetic flood plain and Burhi Gandak, **Fringe Villages:** Sakra, Kanusi, Basahi, Yakubpur, Manjhaul, meghaul, Ekamba, Parora, Narayanipipar, **Village Population & Area:** 1,25,841 (Census 2011) & 7,737 ha, **Common Species:** 221 Birds Species (Including, Migratory Ducks, Coots, Dabchick, Herons, Whistling Ducks, Little Grebe, Greylag Goose, Golden Plover, Common

Snipe etc.), 50 Fish Species (including, Labeo, Cirrhinus Mrigala, *C. Reba*, *C. Punctatus*, Notopterus, and *Anabas Testudineus* etc.), 165 Plants, 55 Macrophytes and 394 Species of fauna.



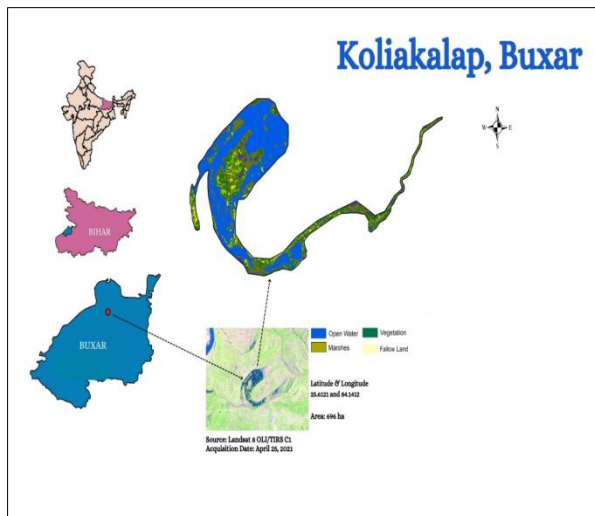
Map 2: Lake Baraila, Bihar

Wetland Type: Natural Lake (also known as Salim Ali Jubba Sahni Bird Sanctuary), **Location & Area:** Vaishali (25.76344674 and 85.55397493) & 1,204 ha, **River Basin:** Burhi Gandak, **Fringe Villages:** Amthanwa, Dulwar, Loma, Mahthi Dharamchand, **Village Population & Area:** 18,996 (Census 2011) & 1,432 ha, **Common Species:** Birds Species (The Indian Shag, Red Collard Dove, Asian Koel, Small Bee Catcher, Brahmany Starlet, and Tree Pie), 104 Herbaceous, 15 Climbers, 11 Trees and 04 Shrubs.



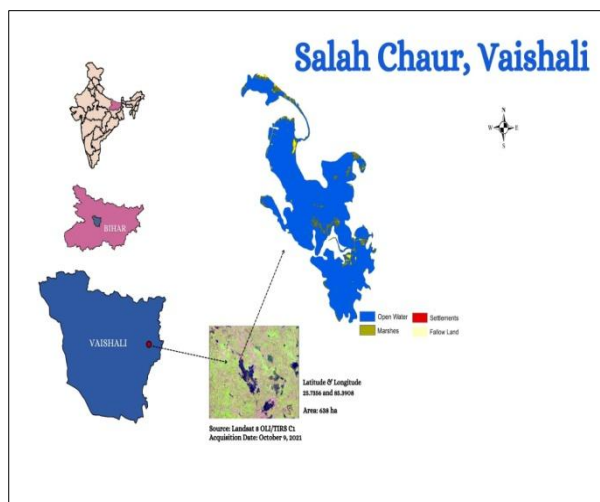
Map 3: Mirzapur Bahiyara Wetland, Bihar

Wetland Type: Natural Waterlogged, **Location & Area:** Saran (26.08315556 and 84.70468889) & 721 ha, **River Basin:** Gandak, **Fringe Villages:** Dhaurigopal, Barahimpur Chakarpan, Madarpur, Sankauli, Korranw, Barahimpur Gopi, Bahiara, Katsa, Najiba, Bindra Patak, Rampur Khas, Rampur Digar, Sonhani, Manan Patti, Mirzapur Bahiyara, **Villages Population & Area:** 25,902 (Census 2011) & 2,322 ha.



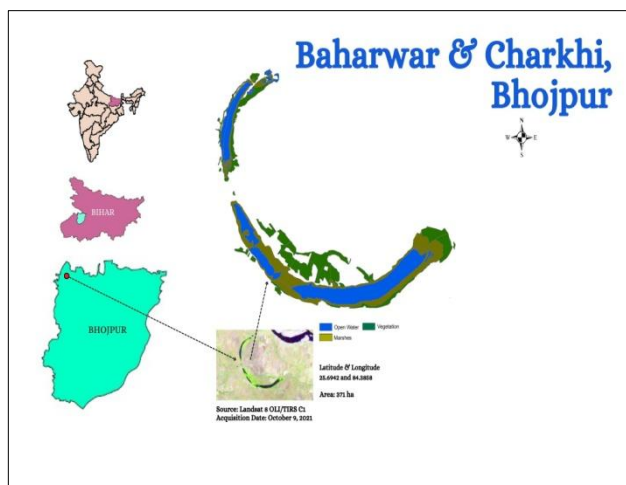
Map 4: Koliakalap Wetland, Bihar

Wetland Type: Ox-Bow Lake, **Location & Area:** Buxar (25.612112 and 84.141266) & 696 ha, **River Basin:** Gangetic flood plain, **Fringe Villages:** Bhojpur Kadim, Bhojpur Jadid, Rampur Mathiya, Chandpali, Koliya, Shikarpur, Basgitiya, Marwatiya, **Villages Population & Area:** 38,987 (Census 2011) & 2,007 ha.



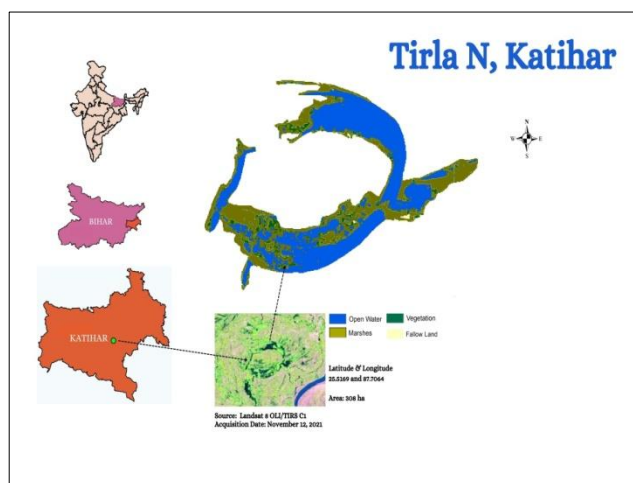
Map 5: Salah Chaur Wetland, Bihar

Wetland Type: Natural Lake, **Location & Area:** Vaishali (25.735661 and 85.390876) & 638 ha, **River Basin:** Burhi Gandak, **Fringe Villages:** Tajpur Raj Urf Bahora, Zahid Chak, Bahsi Saidpur, **Common Species:** Fauna Species (Stork, Cormorant), **Villages Population & Area:** 6,485 (Census 2011) & 756 ha.



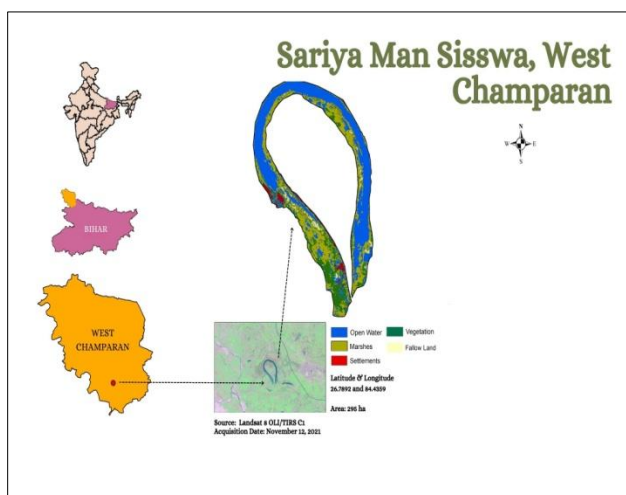
Map 6: Baharwar and Charkhi Wetland, Bihar

Wetland Type: Natural Ox Bow Lake/Cut Off Meander, **Location & Area:** Bhojpur (25.694273 and 84.385802) & 371 ha, **River Basin:** Gangetic flood plain, **Fringe Villages:** Suhiya, Ramchandar Semaria, Lilari, Sahjauli, Bahoranpur Dakhinwar, Parsonda, Isharpura, Nathpae, Chamarpur, Sonbarsa, **Villages Population & Area:** 33,898 (Census 2011) & 3,611 ha



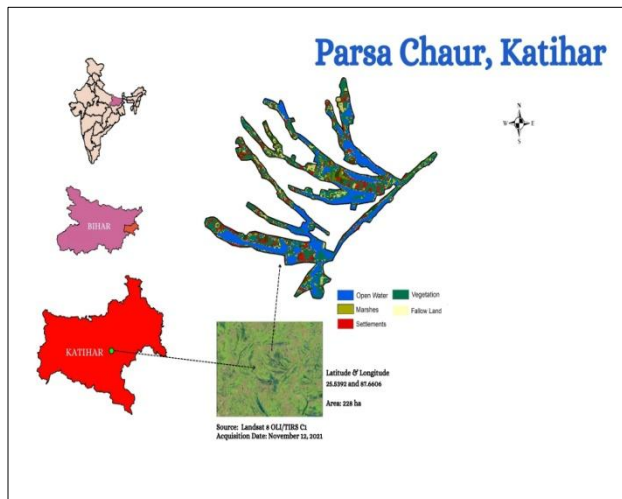
Map 7: Tirla N Wetland, Bihar

Wetland Type: Natural Ox Bow Lake, **Location & Area:** Katihar (25.5169 and 87.7064) & 308 ha, **River Basin:** Gangetic flood plain, **Fringe Villages:** Dharhan, Rahar, Panki, Pakaria, Harsua, Jaunia, **Villages Population & Area:** 11,439 (Census 2011) & 1,527 ha.



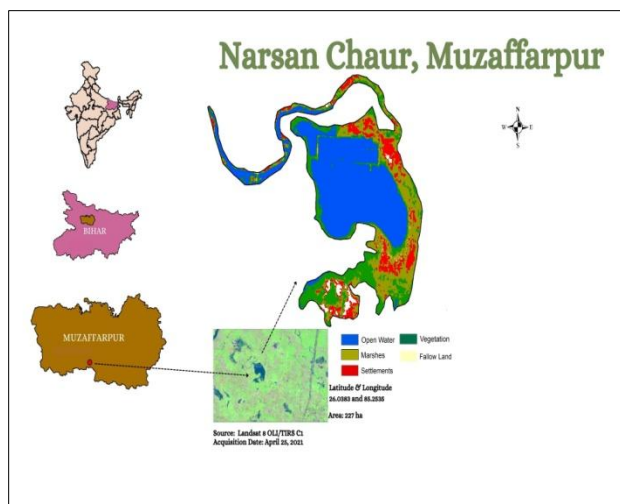
Map 8: Sariya Man Sisswa Wetland, Bihar

Wetland Type: Natural Ox Bow Lake, **Location & Area:** West Champaran (26.789200 and 84.435990) & 295 ha, **River Basin:** Burhi Gandak, **Fringe Villages:** Balua Rampur, Majhariya, Tola Tumkaraia, Sisswa Sarea, Tola Malahi, **Villages Population & Area:** 23,966 (Census 2011) & 2,548 ha.



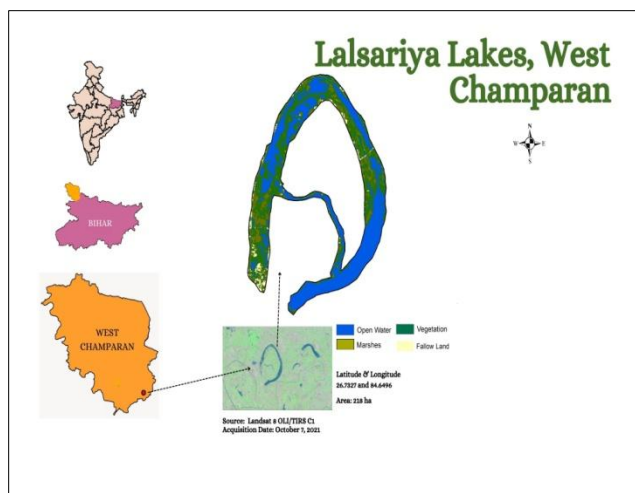
Map 9: Parsa Chaur Wetland, Bihar

Wetland Type: Natural Lake, **Location & Area:** Katihar (25.5392 and 87.6606) & 228 ha, **River Basin:** Gangetic flood plain, **Fringe Villages:** Mohnipipra, Tikaili, Paharpur, Jabra, Harphara, Budhaili, **Villages Population & Area:** 7,567 (Census 2011) & 1,200 ha.



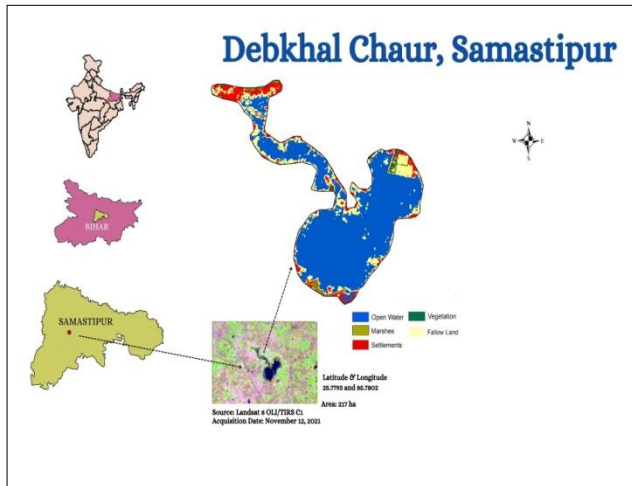
Map 10: Narsan Chaur Wetland, Bihar

Wetland Type: Natural Lake, **Location & Area:** Muzaffarpur (26.038343 and 85.253565) & 227 ha, **River Basin:** Burhi Gandak, **Fringe villages:** Phanda urf Bishunpur Phanda, Bahilwara bhual, **Village Population & Area:** 10,989 (Census 2011) & 1,111 ha.



Map 11: Lalsariya Wetland, Bihar

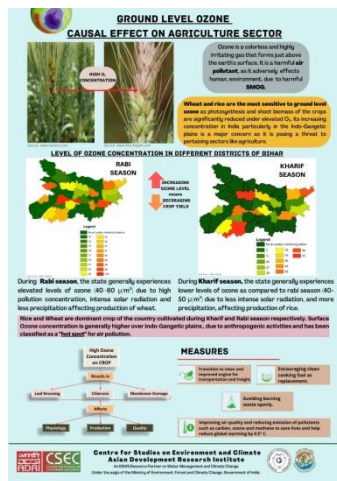
Wetland Type: Natural Ox Bow Lake/Cut Off Meander, **Location & Area:** West Champaran (26.73271389 and 84.64967222) & 218 ha, **River Basin:** Burhi Gandak, **Fringe Villages:** Rajabhar, Lal Saraia, Karamwa, Majharia Shekh, **Villages Population & Area:** 27,939 (Census 2011) & 2,677 ha.



Map 12: Debkhal Wetland, Bihar

Wetland Type: Natural Lake, **Location & Area:** Samastipur (25.779306 and 85.780258) & 217ha, **River Basin:** Burhi Gandak, **Fringe Villages:** Lakhmipur Maheshpatti Deal, Saidpur Zahid, Raepur, Bhagwanpur Kamla, Dariapur Pataili, Rampur Keshopatti, Rupauli Buzrug, **Villages Population & Area:** 46,083 (Census 2011) & 2,411 ha.

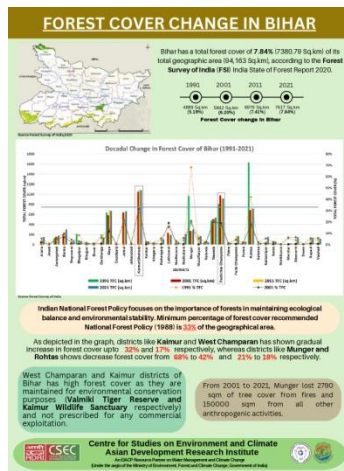
Infographics



Ground Level Ozone Causal Effect on Agriculture Sector

This infographic highlights the causal effect of the concentration of ground-level ozone on agricultural productivity in different districts of Bihar. It is a synthesis of data hosted by the Bihar State Pollution Control Board.

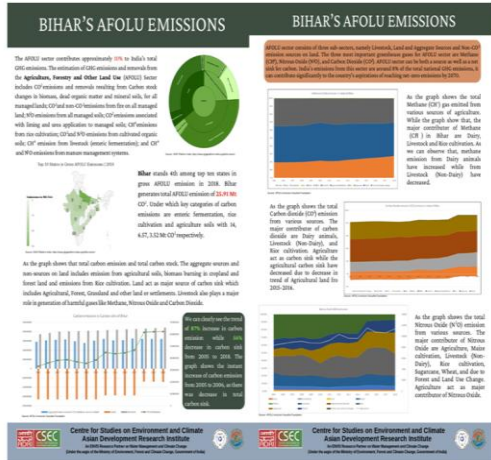
Available at: <https://www.adriindia.org/publications/brochures/39>



Forest Cover Change in Bihar

This infographic presents the decadal changes in forest cover of Bihar from 1991-2021. The date used is borrowed from the Forest Survey of India reports. Several dynamic changes are evident and can be seen in the infographic.

Available at: <https://www.adriindia.org/publications/brochures/41>



Bihar's Agriculture, Forestry and Other Land Use (AFOLU) Emissions

To meet the commitments under the Paris Climate Pact, the development and reporting of sectoral emission inventory is a key priority. This infographic is an attempt on similar lines and reflects on the AFOLU emissions for the state of Bihar.

Available at:

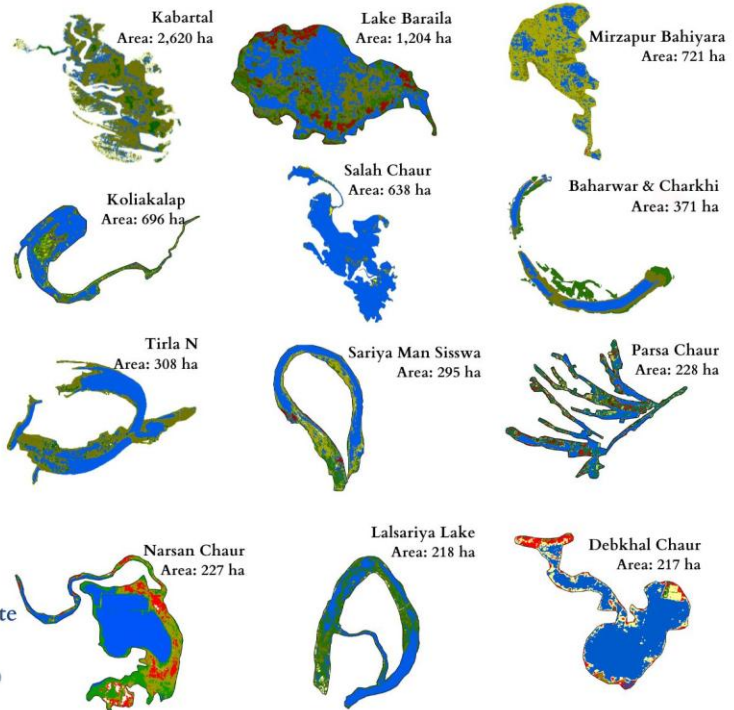
<https://www.adriindia.org/publications/brochures/40>

Calendar

Explore
**WETLANDS
OF
BIHAR**

Calendar 2023

Produced By
**Centre for Studies on Environment and Climate
Asian Development Research Institute**
An EIACP Resource Partner on Water Management and Climate Change
(Under the aegis of the Ministry of Environment, Forest and Climate Change, Government of India)



Available at: <https://www.adriindia.org/publications/brochures/43>

Knowledge Dissemination

1. Special Lectures/ Webinars/Workshop

I. Roundtable Discussion on Economic Growth Prospects of Bihar

Patna, Jul 01 2022: Understanding various aspects of the growth and development process is critical. The roundtable discussion intended to brainstorm on potential growth and development pathways for the state of Bihar. It aimed to understand and inform potential scenarios related to Growth in GDP, change in the share of agriculture, manufacturing, and services sector in the economy, urbanization patterns and pathways for the same, Urban-rural income divide and participation of labour force.



(Web source: <https://www.adriindia.org/events/roundtable-discussion-on-economic-growth-prospects-of-bihar>)

II: Green Dialogue: Greening Priority Sectors for Sustainable Economic Recovery in Bihar

Patna, July 27 2022. The EIACP-RP CSEC at ADRI Patna, in collaboration with Development Alternative (DA), New Delhi, organized a 'Green Dialogue' in Bihar. It is part of a series of dialogues on 'Greening the Priority Sectors for Sustainable Economic Recovery in Bihar.' The discussion intended to brainstorm on prospects of green growth in the priority sectors, like industries and agriculture, through technological and financial innovations, under the policy landscape of Bihar.



(Web source: <https://www.adriindia.org/events/green-dialogue-greening-priority-sectors-for-sustainable-economic-recovery-in-bihar>)

III. Technical Consultation on 'Zero-Hunger, Zero-Carbon Food Systems (ZHHC)' in Bihar

Patna, August 11 2022. A consultation workshop on “Zero-Hunger and Zero-Carbon Food system in Bihar” was co-hosted by the Tata Cornell Institute for Agriculture and Food nutrition (TCI) at Cornell University and the EIACP-RP CSEC at ADRI in Patna. The workshop aimed to discuss and develop a Green House Gas (GHG) emissions reduction strategy in the agriculture sector, which envisions addressing SDG goal-2, i.e., Zero Hunger and Food Security. (Web source: <https://www.adriindia.org/events/technical-consultation-on--zero-hunger-zero-carbon-food-systems-zhzc--in-bihar>)



IV. Roundtable Discussion on State Initiatives for Transformation Towards Green Economic Growth

Patna, November 22 2022. EIACP-RP CSEC at ADRI, in collaboration with the Centre for Budget and Governance Accountability (CBGA), Delhi, hosted a roundtable discussion on "Bihar's Policy and Budgetary Priorities for Transitioning towards Green Economic Recovery." The discussions emphasized the need to devise an economic recovery pathway for Bihar which is in sync with sustainable development goals as declared by the UN. It can ensure a strong economy capable of withstanding sudden shocks (pandemic or climatic-related) and bring several social benefits. The discussion aimed to disseminate the critical study findings of CBGA through policy priority analysis in financing climate change mitigation actions (clean energy financing in Bihar).



(Web source: <https://www.adriindia.org/events/roundtable-discussion-on-state-initiatives-for-transformation-towards-green-economic-growth>)

2. Awareness Programmes

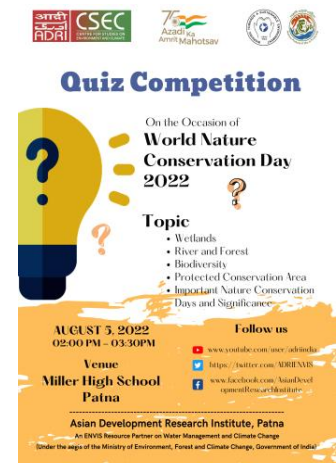
I. Hariyali Mahotsav

July 06, 2022. EIACP-RP CSEC at ADRI organized a Plantation drive at ADRI at one of the community parks in Patna. The idea behind the program was to spread awareness of the importance of green cover and to encourage the practice of plantations. The event was organized during the Hariyali Mahotsav week as per the guidelines of MoEF&CC.



II. Quiz Competition on the occasion of World Nature Conservation Day

August 5 2022. The EIACP-RP CSEC at ADRI organized a quiz competition at Devipada Choudhary Shaheed Smarak Miller High School on World Nature Conservation Day. Additionally, commemorating 75 years of Indian Independence ('Azadi ka Amrit Mahotsav') the EIACP centre engaged with the youths and school



students to build awareness of their surrounding natural resources and biodiversity.

Students and faculties participated in the program, which was conducted as an interactive quiz competition. Mr. Vinay Kumar Singh, Principal Miller High School, chaired the event and encouraged the students to understand the significance of conserving natural resources and biodiversity.

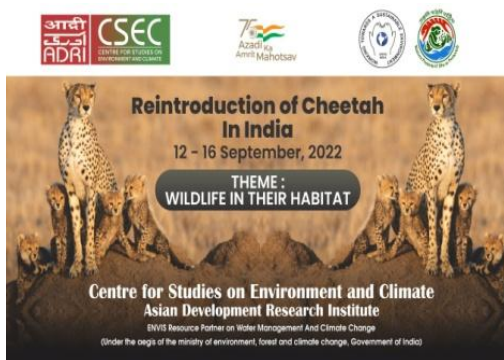
III. Online/offline competition on the Reintroduction of Cheetah

September 8–16, 2022. To educate the students about the "Reintroduction of Cheetah in India," an online/offline Competition was organized by EIACP-RP CSEC at ADRI at different schools in Bihar. Almost 200 to 300 students participated in this competition. The competitions included poems, essays, slogans, posters and story-writing submissions.



IV. Special Lecture on "Reintroduction of Cheetah"

16th September 2022: To create awareness about the "Reintroduction of Cheetah in India," a physical awareness drive was organized by EIACP-RP CSEC at ADRI in different schools and institutions, namely Rajkiya Madhya Vidyalaya, Rajapur Patna, Kilkari Bihar Bal Bhawan Patna, and Royal Public School Baluaha, Begusarai. More than 500 students participated in these Lectures cum awareness campaigns.



V. Poster Exhibition and Special Lecture on World Ozone Day

16th September 2022: A Special Lecture and Poster Exhibition was organized at Kilkari Bihar Bal Bhawan, Patna, to create awareness on "WORLD OZONE DAY."

The lecture intended to educate the students about the science behind ozone, including its chemical structure, importance, the ozone cycle, its depletion, and the formation of the ozone hole. The policy interventions (e.g., Montreal Protocol) aimed at



curbing ozone layer depletion were also discussed. Almost 100 students and a few teachers, and non-teaching staff attended the session.

VI. A river walk cum awareness drive on the occasion of World River Day

25th September 2022: An awareness program on the occasion of "World River Day 2022" was organized by the CSEC-ADRI EIACP Center in Patna. This program aimed to raise public awareness about the nuances of anthropogenic influences on riverine ecology and encourage their preservation through a collective change in the 'Life Style for Sustainable Environment.' The program included a walk along the edges of the Ganga River cum a cleanup drive along the banks, followed by special lectures on the biodiversity and ecology of Ganga. The Lectures were delivered by Dr. Gopal Sharma, Joint Director Zoological Survey of India, and Navin Kumar from the Indian Bird Conservation Network. Dr. Prabhat P Ghosh, Mr. Vivek Tejaswi, Dr. Ajeet Singh, Ms. Pooja Kumari, Ms. Sarada Modal, Mr. Sanjeev Kumar, and a few faculty members from ADRI were present. Volunteers from Kilkari, Bihar Bal Bhawan, Bhumi, NIT, Patna University, and others participated in the cleanup drive.



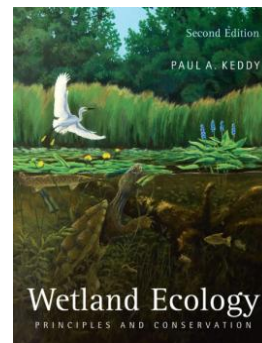
Important Readings

Wetland Ecology: Principles and Conservation by Paul A. Keddy

Wetland Ecology by Paul A. Keddy is a concise guide to the science behind wetlands. It extends an overview of the current scientific literature on wetlands targeted towards senior-level students and professionals.

Available at:

https://books.google.co.in/books?hl=en&lr=&id=eVeaSqFy2VgC&oi=fnd&pg=PR5&dq=wetland&ots=MgW7ieeNGf&sig=SsOf5sstIK4WK9-Zi5 Ri1M30Nc&redir_esc=y#v=onepage&q=wetland&f=false

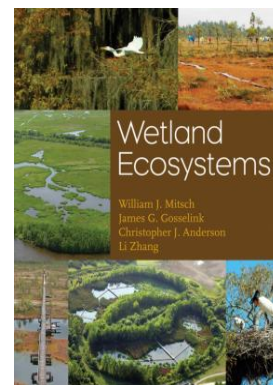


Wetland Ecosystems by William J. Mitsch, James G. Gosselink, Li Zhang, Christopher J. Anderson

This book comprehensively covers wetland science, management options, and restoration practices. Following an introduction to ecosystems in general and wetland ecosystems in particular, Wetland Ecosystems examine the major types of wetlands found worldwide: coastal wetlands, freshwater marshes and forested swamps, and peatlands. The final chapter reviews three fundamental system approaches to studying wetlands: mesocosms, full-scale experimental ecosystems, and mathematical modelling.

Available at:

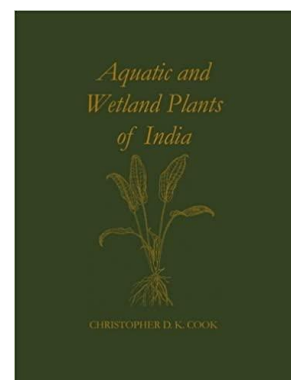
https://books.google.co.in/books?hl=en&lr=&id=s0qAkixjuggC&oi=fnd&pg=PR5&dq=wetland&ots=ZeEnZqIjK&sig=HkACWAtmQUaGYbL6l4JWv5eeCOs&redir_esc=y#v=onepage&q=wetland&f=false



Aquatic and Wetland Plants of India by Christopher D. K. Cook

The book is a comprehensive compilation of chapters extending information on aquatic and wetland plants. The authors have summarised extensive data on wetland-based plants' distribution, biology and ecology and have created a valuable synthesis. The book is necessary not only for anyone interested in the flora of peninsula India but also a valuable source of information for researchers and students of tropical floras or taxonomy and the distribution of wetlands and water species worldwide.

Available at: <https://global.oup.com/academic/product/aquatic-and-wetland-plants-of-india-9780198548218?lang=en&cc=gb>



Appendix I

MEDIA COVERAGE

दैनिक भास्कर • पटना, बुधवार, 23 नवंबर, 2022

वित्तीय नियंत्रण में पारदर्शिता और सुशासन को बढ़ावा देने में सीएजी की विशेष भूमिका

पटना | महालेखाकार (लेखा परीक्षा) रामावतार शर्मा ने कहा कि देश के वित्तीय नियंत्रण में जवाबदेही, पारदर्शिता और सुशासन को बढ़ावा देने में भारत के नियंत्रक एवं महालेखापरीक्षक (सीएजी) की विशेष भूमिका है। वे लेखापरीक्षा जागरूकता सप्ताह के अवसर पर आयोजित "भारत के नियंत्रक एवं महालेखापरीक्षक के प्रति जनता की धारणा और इससे अपेक्षाएं" विषय पर आयोजित सेमिनार को संबोधित कर रहे थे। कार्यक्रम में योजना एवं विकास विभाग के



PANEL DISCUSSION

अपर मुख्य सचिव अरुणिश चावल ने कहा कि अधिकारी वित्तीय अनुशासन को बनाए रखने का प्रयत्न करते हैं। राज्य के वित्त विभाग के पूर्व प्रधान सचिव रामेश्वर सिंह ने कहा कि आज पीपीपी मोड में काम करने का जमाना आ गया है।

प्रभात खबर
पटना, बुधवार, 23.11.2022

जलवायु संकट पर मिलकर करना होगा काम

पटना. आद्री के सदस्य सचिव डॉ प्रभात पी घोष ने कहा कि जलवायु परिवर्तन के संकट को कम करने के लिए सरकार और समाज को मिलकर काम करना होगा. मंगलवार को आद्री स्थित सेंटर फॉर स्टडीज ऑन इन्वायर्नमेंट एंड क्लाइमेट चेंज और सेंटर फॉर बजट एंड गवर्नेंस एकाउंटेबिलिटी दिल्ली द्वारा आयोजित 'बिहार पॉलिसी एंड बजटरी प्रॉयोरिटी फॉर बिहार ट्रांजिफर्मिंग टूवाइस ग्रीन इकोनॉमिक रिकवरी' विषय पर आयोजित परिचर्चा में उन्होंने यह बातें कहीं. बैठक में डॉ सुधांशु ने कहा, बजट में जलवायु परिवर्तन और पर्यावरण जैसे गंभीर विषयों पर भी ध्यान देने की जरूरत है. हालांकि बिहार में जलवायु परिवर्तन और पर्यावरण पर खर्च होने वाली राशि को लेकर ग्रीन बजट का प्रावधान किया गया है. लेकिन इसे प्राथमिकता में लाने की जरूरत है. सीबीजीए की डॉ. ज्योत्सना गोगल ने अक्षय ऊर्जा क्षेत्र और स्वच्छ प्रौद्योगिकी उद्योगों में हरित नौकरियों के सृजन के लिए राज्य स्तर पर एक ढांचे के विकास की आवश्यकता पर जोर दिया.

दैनिक भास्कर, पटना, बुधवार, 23 नवंबर, 2022

बिहार

अर्थव्यवस्था को चुनौतियों से लड़ने लायक बनाने की जरूरत

आद्री में गोलमेज परिचर्चा आयोजित, हरित विकास के एजेंडे पर और काम किया जाए

भास्कर न्यूज़ | पटना



आद्री स्थित सेंटर फॉर स्टडीज ऑन इन्वायर्नमेंट एंड क्लाइमेट चेंज (सीएसईसी-आद्री) ने सेंटर फॉर बजट एंड गवर्नेंस एकाउंटेबिलिटी (सीबीजीए), दिल्ली के सहयोग से 'बिहारस पॉलिसी एंड बजटरी प्रॉयोरिटी फॉर बिहार ट्रांजिफर्मिंग टूवाइस ग्रीन इकोनॉमिक रिकवरी' पर विषय पर आज एक गोलमेज परिचर्चा की मेजबानी की। परिचर्चा में बिहार के सतत आर्थिक विकास की प्राथमिकताओं से जुड़े विभिन्न पहलुओं पर जोर दिया गया। साथ ही अर्थव्यवस्था को किसी भी अचानक चुनौती (महामारी या जलवायु) का सामना करने के लिए पर्याप्त मजबूत बनाने पर भी प्रकाश डाला गया। चर्चा की अध्यक्षता करते हुए डॉ.

प्रभात पी घोष ने हरित विकास के एजेंडे की दिशा में शासन के सभी स्तरों द्वारा सामूहिक कार्रवाई और प्रभावी कार्यान्वयन के लिए एकीकृत योजना की आवश्यकता पर जोर दिया। सीडीपीएफ-आद्री के डॉ. सुधांशु कुमार ने प्रभावी सार्वजनिक वित्त तंत्र को कैसे आत्मसात किया जाए, जैसे कि सार्वजनिक वित्त के लिए पर्याप्तता सुनिश्चित करना, कार्यान्वयन दक्षता और साथ ही राज्य के लिए सतत विकास लक्ष्यों का पालन करना के बारे में जानकारी दी।

THE TIMES OF INDIA, PATNA
WEDNESDAY, NOVEMBER 23, 2022

Experts for implementation of green budgeting in state

TIMES NEWS NETWORK

Patna: The Centre for Studies on Environment and Climate (CSEC) at the Asian Development Research Institute (ADRI-Patna), in collaboration with the Centre for Budget and Governance Accountability (CBGA), Delhi, hosted a round-table discussion on 'Bihar's policy and budgetary priorities for transitioning towards green economic recovery' here on Tuesday.

The round-table emphasized on the need to drive an economic recovery pathway for Bihar which is in sync with sustainable development priorities and make economy strong enough to withstand any sudden shocks (pandemic or climatic). The discussion was aimed at disseminating the study findings from CBGA which analysed the financing of climate change mitigation actions, which is clean energy financing in Bihar.

Presiding over the discussion, Prabhat P Ghosh emphasised on collective actions by all the tiers of government towards the agenda of green growth and the need for integrated planning for effective implementation.

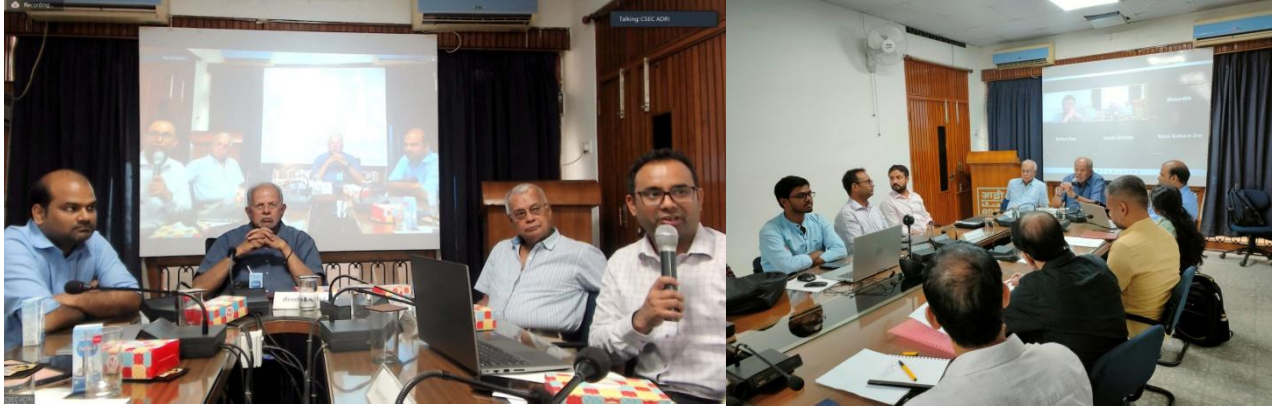
Sudhanshu Kumar of CEPPF-ADRI gave inputs about how to imbibe effective public finance delivery mechanism, such as ensuring adequacy for public finances, implementation efficiency and at the same instance adhering to sustainable development goals for the state. Jyotsna Goel from CBGA emphasized the need for development of a framework at state level for creation of green jobs from the renewable energy sector and in clean technology industries.

Vivek Tejaswi of CSEC-ADRI highlighted the role of budgeting tool for greening the public finance management system in Bihar and aligning it with green growth objectives.

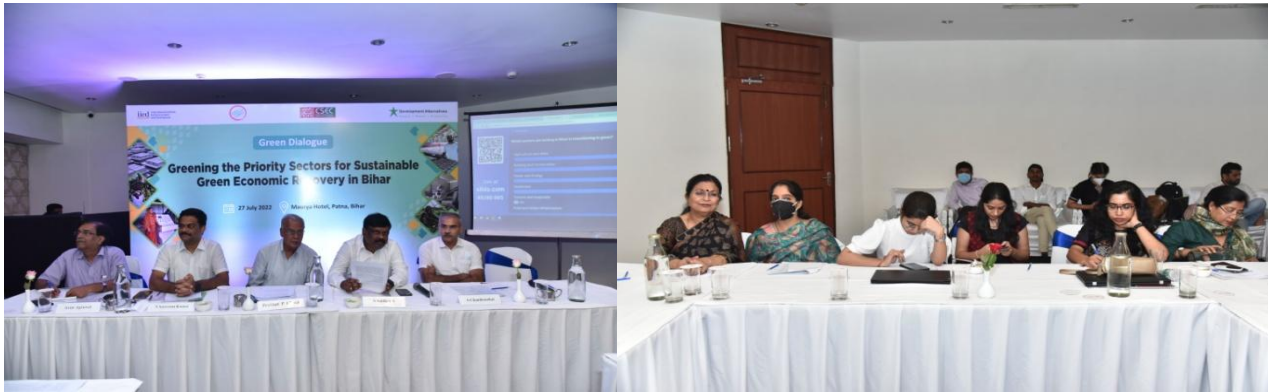
Representatives from SIDBI, Bihar Skill Development Mission, State Pollution Control Board, RTI, WRI, CEEW, SSEF and various other organisations were present in the discussion.

Appendix II

PHOTO GALLERY



Glimpses of Roundtable Discussion on Economic Growth Prospects of Bihar



Glimpses of Green Dialogue on Greening Priority Sectors for Sustainable Economic Recovery in Bihar



Hariyali Mahotsav 2022



Glimpses of World Nature Conservation Day at Miller High School



Technical Consultation on 'Zero-Hunger, Zero-Carbon Food Systems (ZH2C)' in Bihar



Awareness Campaign on "Reindroduction of Cheetah"



Glimpses of World Ozone Day 2022



Glimpses of World River Day 2022



Roundtable Discussion on State Initiatives for Transformation Towards Green Economic Growth

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