BIODIVERSITY ASSESSMENT REPORT OF NTPC KAHALGAON SUPER THERMAL POWER STATION, BHAGALPUR, BIHAR

For more information

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Abbreviations

BDL	Below Detected Limit
BOD	Biological Oxygen Demand
CHP	Coal Handling Plant
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
CWC	Central Water Commission
DO	Dissolved Oxygen
EIA	Environment Impact Assessment
ENS	Effective Number of Species index
ESP	Electrostatic Precipitator
ESRI	Environmental Systems Research Institute
FA	Fly Ash
FGD	Flue Gas Desulfurization
GEC	Groundwater Resource Estimation Committee
GMPH	Ganga Makeup Pump House
GPS	Global Positioning System
HFL	Highest Flood Level
IMD	Indian Meteorological Department
IVI	Importance Value Index
IUCN	International Union of Conservation of Nature
KhSTPS	Kahalgaon Super Thermal Power Station
LULC	Land Use and Land Cover
NABL	National Accreditation Board for Testing and Calibration Laboratories
NAAQ	National Ambient Air Quality Standards
NOX	Nitrogen Oxides
NPK	Nitrogen, Phosphorus and Potassium
NRSC	National Remote Sensing Centre
NRT	Near-Real-Time
NTPC	National Thermal Power Corporation
PM	Particulate Matter
PSU	Public Sector Undertaking
ROI	Region of Interest
SOX	Sulphur Oxides
Sch-II	Schedule II
Sch- IV	Schedule IV
Sch-V	Schedule V
SDG	Sustainable Development Goals
STP	Sewage Treatment Plant
TDS	Total Dissolved Solids

TOF	Trees Outside Forest
TSS	Total Suspended Solids
VES	Visual Encounter Surveys
VGDS	Vikramshila Gangetic Dolphin Sanctuary
VWC	Volumetric Water Content
WPA	Wildlife Protection Act
ZLD	Zero Liquid Discharge

Glossary

Abundance	Number of individuals of a species in the quadrats where it is found; differentiates clustered vs evenly spread species
Agriculture runoff	Runoff happens when water from rain, melted snow or irrigation does not sink into the soil for proper absorption
Agriculture habitat	Habitat of floral species present in agricultural areas within the buffer zone
Amphibian	Amphibian, (class Amphibia), any member of the group of vertebrate animals characterized by their ability to exploit both aquatic and terrestrial habitats.
Ambient noise level	Ambient noise level refers to the overall level of sound present in a particular environment, which includes all sounds from various sources.
Ambient temperature	Ambient temperature is specifically the temperature of the air in any particular place as measured by a thermometer.
Angiosperms	Angiosperms are plants that produce flowers and bear their seeds in fruits. They are the largest and most diverse group within the kingdom Plantae, with about 300,000 species.
Ash dyke	Ash Dykes are retaining structures to contain ash slurry (or continuous placement of unused ash to ensure uninterrupted operation of the thermal power plant) and settled ash (till it is used for any beneficial purpose).
Avifauna	The birds of a particular region, habitat or period of time
Best practices	Best practices refer to proven methods and strategies that are generally accepted as superior for reducing or eliminating risks and hazards.
Biodiversity	Variability of living organisms in a particular environment
Biodiversity Assessment	Systematic evaluation of an area's biological diversity, focusing on species richness, distribution, and ecosystem functions
Biodiversity Conservation	Practice of protecting and preserving wealth and variety of species, habitats, ecosystems, and genetic diversity for safeguarding ecosystem
Bio-methanation plant	In this process, organic waste is converted into biogas in the presence of microorganisms under anaerobic conditions
Biological Oxygen Demand	Measure of the amount of oxygen needed by bacteria and other microorganisms to fully oxidize the organic matter present in a water sample

Bryophytes	Bryophytes are a group of non-vascular, seedless plants that include mosses, liverworts, and hornworts.
Chemical Oxygen Demand	Amount of oxygen required to chemically oxidize organic matters by strong oxidants like Potassium dichromate
Coal handling facility	A facility which receives, processes, stores and transports coal, primarily for use in power plants or other industrial facilities
Coal Stock Yard	The designated place on the surface within the mine / Project premises where the mined coal is stored for delivery to the prospective coal buyers/Customers
Condenser	A condenser is a two-phase heat exchanger since the refrigerant-side design anticipates a change of phase from gas to liquid between entering and leaving conditions.
Clarifier	The primary duty of a clarifier is to remove relatively small amounts of solid from more dilute suspension to yield a clarified liquid overflow and a generally unwanted solids sludge underflow
Climate regulation	The natural and human systems that control atmospheric conditions, including temperature, precipitation, and weather patterns
Density	Number of individuals of a species per unit area; indicates species abundance
Direct threat	Threats that are directly related to and caused by the human interventions and operational activities of Thermal power plant
Dredging	Removal of sediments and debris from the bottom of lakes, rivers and other water bodies
Dominant species	Species that have high abundance relative to other species in a community, and have proportionate effects on environmental conditions, community diversity and ecosystem function
Dissolved Oxygen	Total amount of oxygen in aquatic environments that is accessible to fish, invertebrates and all organisms in the water
Dynamic World dataset	A 10 m near-real-time (NRT) Land Use/Land Cover (LULC) dataset that includes class probabilities and label information for nine classes
Ecological degradation	The process by which natural settings are impaired or degraded through human activities or natural occurrences
Ecological niche	Ecological niche is a term for the position of a species within an ecosystem, describing both the range of conditions necessary for persistence of the species, and its ecological role in the ecosystem

Ecological threats	Ecological threats are dangers to the environment and its natural systems, encompassing factors like climate change, pollution, resource depletion, and habitat destruction.
Ecosystem resilience	The ability of an ecosystem to maintain its normal patterns of nutrient cycling and biomass production after being subjected to damage caused by an ecological disturbance.
Effective Number of Species Index	A measure of species diversity that overcomes several limitations in terms of both diversity indices and species richness
Electrostatic Precipitator	A pollution control device that uses an electric charge to remove certain impurities- either solid particles or liquid droplets, from air.
Electrical conductivity	Measures the ability of soil water to carry electrical current
Endangered species	An endangered species is a plant, animal, fungus, microbe, or other organism that is threatened by extinction.
Environmental Impact Assessment	Environmental Impact Assessment is a tool used to assess the significant effects of a project or development proposal on the environment
Environmental Stewardship	The responsible use and protection of the natural environment through conservation and sustainable practices to enhance ecosystem resilience and human well-being
ESRI 10 m land cover dataset	A global, high-resolution map of land use and land cover derived from ESA Sentinel-2 imagery
Exotic species	Exotic species are organisms that have been introduced into an area outside their normal distribution.
Fauna	The animals characteristic of a region, period, or special environment.
Family	A family is a taxonomic rank. Each family contains one or more genera.
Fly ash	Finely divided residue which results from the combustion of pulverized coal and is transported from the combustion chamber by exhaust gases
Flue Gas Desulfurization	Technology used to remove sulfur dioxide from exhaust flue gases of fossil-fuel power plants and other sources
Flora	Plants or plant life especially of a region, period, or environment.

Frequency	Percentage of sampling units in which a species occurs; measures species distribution within a habitat
Foundation species	Species that have large effects on their surroundings and create conditions required for the persistence of many other species.
Foliar injury	Foliar diseases/injuries are plant disorders that affect the leaves of a plant. Foliar diseases can be caused by fungi, bacteria, or even viruses.
Fugitive emissions	The unintentional and undesirable emission, leakage or discharge of gases or vapors from pressure-containing equipment or facilities, and from components inside industrial plants.
Genus	It's a level of taxonomic classification between family and species, placing it within the hierarchy of biological classification. The genus name is the first part of a species' scientific name in binomial nomenclature.
Grassland habitat	Habitat of floral species across grasslands/non-agricultural lands in buffer zone.
Greenbelt development	Green belt is the development of green cover around on empty land inside the project area or within the project influence area.
Gymnosperm	Any vascular plant that reproduces by means of an exposed seed, or ovule—unlike angiosperms, or flowering plants, whose seeds are enclosed by mature ovaries, or fruits.
Habitat assessment	A habitat assessment, sometimes called a habitat evaluation, reviews, and rates habitat quality and assesses the integrity of the aquatic or terrestrial system to support species.
Habitat degradation	Habitat degradation occurs when the ecosystem is disrupted but not destroyed, increasing the difficulty of survival for native plants and animals.
Habitat fragmentation	The process where large habitats are broken into smaller, isoated patches.
Habitat composition	Refers to the specific mix of biotic and abiotic elements that characterize a particular habitat.
Herpetofauna	Refers to a group of organisms that includes both amphibians and reptiles.
Impact assessment	A process of evaluating the potential positive and negative consequences of a proposed project or action.

Impervious layer	An impervious layer is a surface or material that prevents water from soaking into the ground; it is essentially a barrier that does not allow water to penetrate.
Indian Meteorological Department	The principal agency in India responsible for meteorological observations, weather forecasting and seismology.
Indicator species	Species whose presence signifies specific environmental conditions or habitat health.
Indirect threats	Threats which are indirectly affecting the local biodiversity such as ecological threats.
Interpolation map	Interpolation predicts values for cells in a raster from a limited number of sample data points. It can be used to predict unknown values for any geographic point data, such as elevation, rainfall, chemical concentrations, and noise levels.
Invasive species	Non-native species that spread rapidly and displace native flora or fauna.
IUCN Red List	A list having world's most comprehensive information source on global extinction risk status of flora and fauna.
Keystone species	Keystone species are defined as strongly interacting species that have a large impact on their ecosystems relative to their abundance.
Land Use and land cover (LULC)	Classification of land based on usage and physical cover.
Land acquisition	Process of acquiring land for industrialization, development of infrastructure facilities or urbanization of the private land.
Low-fertility zones	Geographical areas with a low birth rate, often below the replacement level required to maintain the population size.
Mammal	Mammals are characterized by the presence of milk-producing mammary glands for feeding their young, a broad neocortex region of the brain, fur or hair, and three middle ear bones.
Monofilament gill nets	A type of fishing net that catches fish by enmeshing them, with each mesh having a single strand of synthetic material.
Morphological changes	Morphological changes refer to alterations in the physical form, structure, or appearance of an organism or its components.
NAAQ standards	National Ambient Air Quality Standards are the standards for ambient air quality set by the Central Pollution Control Board that is applicable nationwide.

National Remote Sensing Centre (NRSC)	National Remote Sensing Centre is responsible for remote sensing satellite data acquisition and processing, data dissemination, aerial remote sensing and decision support for disaster management.
Native plant species	Native plants are the indigenous terrestrial and aquatic species that have evolved and occur naturally in a particular region, ecosystem, and habitat.
Non-native species	Organisms that do not occur naturally in an area, but are introduced as the result of deliberate or accidental human activities.
Near Threatened species	Species that are close to becoming threatened or may meet the criteria for threatened status in the near future.
Opportunistic sighting	An opportunistic sighting of wildlife refers to the incidental observation of an animal, not as part of a planned or systematic survey, but rather during a routine activity or observation.
Phytosociological analysis	A method which focuses on characterizing and classifying plant communities based on their species composition and structural characteristics.
Phytoremediation	A bioremediation process that utilizes plants to remove, transfer, stabilize, or destroy pollutants in the environment.
Pielou's Evenness Index	Measures how evenly individuals are distributed among species in an ecosystem.
Pteridophyte	A pteridophyte is a vascular plant (with xylem and phloem) that reproduces by means of spores.
Rapid Biodiversity Assessment (RAP)	A mobile, flexible and cost-effective tool required to generate the scientific data needed to protect nature.
Relative Frequency	Refers to the proportion or percentage of times a particular value or category occurs within a dataset, relative to the total number of observations.
Relative Density	It is defined as the ratio of the density of a substance to the density of a given reference material.
Relative Abundance	Relative abundance refers to the evenness of distribution of individuals among species in a community.
Reptiles	A vertebrate animal of a class that includes snakes, lizards, crocodiles, turtles, and tortoises. They are distinguished by having dry scaly skin and typically laying soft-shelled eggs on land.
Remote sensing	Removal of sediments and debris from the bottom of lakes, rivers and other water bodies.

Simpson's Diversity Index	Measures the probability that two randomly selected individuals from a dataset belong to the same species.
Settlement habitat	Habitat of floral species in settlement/township areas of study site.
Sewage Treatment Plant	Collects, treats and discharges wastewater, providing a service essential to environmental and public health.
Shannon-Wiener Diversity Index	Quantify species diversity by considering both species' richness (total number of species) and species evenness (how individuals are distributed among species).
Soil stabilization	A process that modifies soil properties to improve its strength, durability, and performance for engineering purposes like construction.
Species abundance	A species is considered abundant when it has a high population relative to the size of the area it inhabits.
Species composition	The total number of different species present in a given biome or ecosystem.
Species richness	Species richness, the count, or total number, of unique species within a given biological community, ecosystem, biome, or other defined area.
Stack emissions	Refers to gases and particulates released into the atmosphere through smokestacks or flues in industrial facilities.
Structural diversity	It is the volumetric capacity and physical arrangement of biotic components within ecosystems.
Sustainable Development	Development that meets the needs of the present without compromising the ability of the future generations to meet their own needs.
Threat Assessment	Process of evaluating and verifying perceived threats, including assessing their likelihood.
Tree cover habitat	Habitat of floral species present in TOF/Plantations in study site.
Township	A township, in the context of a thermal power plant, refers to a planned and developed residential area built for the employees and their families working at the plant.
Vascular plant	A plant that has a specialized conducting system that includes xylem and phloem.

Visual Encounter Survey (VES)	A method of searching for animals, particularly reptiles and amphibians, by visually observing them in their natural habitat.
Vulnerable species	A vulnerable species is one that is not currently endangered but faces a high risk of endangerment in the near future, either due to a declining population or threats to natural habitats.
Water body habitat	Habitat of floral species in surface water bodies, including River Ganga, of study site.
Zero Liquid Discharge	Strategic wastewater management system that ensures that there will be no discharge of industrial wastewater into the environment.

Executive Summary

This study presents a comprehensive biodiversity assessment of the **NTPC Kahalgaon Super Thermal Power Station (KhSTPS)** and its surrounding landscape in Bhagalpur district, Bihar. Situated near the ecologically sensitive Vikramshila Gangetic Dolphin Sanctuary, the region hosts a range of terrestrial and aquatic ecosystems that are increasingly influenced by industrial activity. As thermal power plants are known to exert wide-ranging ecological pressures—through air and water pollution, habitat modification, and land-use change—the assessment aims to establish a scientific baseline for biodiversity within the operational and buffer zones of the plant. This study marks an important step toward integrating biodiversity considerations into NTPC's environmental governance, providing data-driven insights that will support habitat restoration, ecological monitoring, and long-term sustainability planning for the Kahalgaon STPS.

Scope and Methodology

The scope of this biodiversity assessment encompassed the NTPC Kahalgaon Super Thermal Power Station (KhSTPS) campus—including the main plant, ash dyke, and township area—along with a 5-kilometre buffer zone surrounding the project site. The landscape under assessment comprises a heterogeneous mix of land use and habitat types, including agricultural lands, open grasslands, water bodies, wetlands, plantation zones, and semi-natural tree cover. The assessment aimed to generate a comprehensive baseline inventory of floral and faunal diversity, assess the current condition of habitats, identify threats associated with industrial operational activities, and recommend mitigation strategies for long-term biodiversity conservation and monitoring. Special emphasis was placed on identifying ecologically sensitive zones, species of conservation concern, and areas impacted by pollution, and invasive species spread.

To achieve these objectives, the study employed a multi-taxa rapid biodiversity assessment approach, integrating both field-based surveys and secondary data review. A stratified sampling framework was adopted, and twelve representative sample grids were selected across varied habitat types. Phytosociological assessments were conducted using quadrat sampling to document vegetation composition, while line transects and visual encounter surveys were used to record birds, mammals, reptiles, amphibians, and invertebrates. In addition, environmental sampling was carried out to assess air, water, and soil quality, with parameters such as PM2.5, BOD, COD, and heavy metals analyzed to understand pollution impacts. GIS and remote sensing tools were used to map habitat types, plot locations, and land use changes. The methodology also included community-level semi structured interviews to incorporate traditional ecological knowledge and local observations, enhancing the contextual understanding of biodiversity trends and perceived threats. Together, these methods provided a robust, landscape-scale perspective on biodiversity patterns, habitat health, and environmental pressures around NTPC Kahalgaon.

Findings

Biodiversity Assessment

The biodiversity assessment conducted across NTPC Kahalgaon and its surrounding 5 km buffer zone revealed a rich and diverse ecological profile, despite the pressures of industrialization. The

study recorded a total of 274 plant species representing 80 families, including 136 herbaceous species, 62 tree species, 27 shrubs, and 14 climbers. The floristic composition showed a dominance of native species, especially in less disturbed habitats such as grasslands, and tree cover zones. Key native species identified include *Alstonia scholaris*, *Typha latifolia*, *Cynodon dactylon*, *Ficus religiosa*, and *Azolla pinnata*. The presence of these species not only indicates ecological resilience but also highlights the potential for restoration using native flora. However, in disturbed habitats such as roadsides, fallow land, and area outside the township boundaries, the study found a proliferation of invasive alien species such as *Parthenium hysterophorus*, *Lantana camara*, and *Eichhornia crassipes*, which pose threats to native plant communities and ecosystem balance.

In terms of fauna, the study recorded 166 faunal species, covering mammals, birds, amphibians, reptiles, fishes, and invertebrates. Bird diversity was particularly high, with the presence of species such as Greater Adjutant Stork (*Leptoptilos dubius*), River Lapwing (*Vanellus duvaucelii*), and Pied Cuckoo (*Clamator jacobinus*). Several sightings of the Gangetic Dolphin (*Platanista gangetica*) were reported from the adjacent riverine areas, reaffirming the ecological connectivity of the NTPC landscape to the Vikramshila Gangetic Dolphin Sanctuary. Butterflies, frogs, and dragonflies were also observed in high numbers, particularly around the wetlands and vegetated drainage zones, underscoring the availability of microhabitats that support life-cycle functions such as breeding, nesting, and foraging. Overall, the assessment reflects a biologically productive and diverse mosaic landscape, with clear indicators of both ecological richness and vulnerability.

Threat Assessment

The threat assessment component of the study systematically identified and evaluated 26 specific threats to biodiversity in the NTPC Kahalgaon landscape. These threats were assessed using a structured matrix based on three parameters: scope (magnitude of impact), severity (frequency of threat). Among the most pressing issue were direct industrial activities, including emissions from coal combustion, fugitive ash dispersion from the ash dyke, and vehicular emissions from coal transport and logistics operations.

In addition to operational impacts, anthropogenic pressures were found to be significant, particularly in the form of illegal fishing, grazing, and unsustainable agricultural practices involving chemical runoff and habitat encroachment. These activities were observed both within NTPC-managed areas and the surrounding villages, pointing to the need for community-inclusive conservation approaches. Ecologically, the spread of invasive plant species, increase in temperature and extreme rainfall patterns were identified as chronic, long-term risks to local biodiversity. Seasonal flooding in low-lying ash dyke areas was found to exacerbate the degradation of soil and aquatic quality, further affecting dependent flora and fauna. Overall, the threat analysis highlights a need for targeted mitigation strategies, continuous ecological monitoring, and a structured biodiversity conservation strategies.

Habitat Assessment

The landscape-level habitat assessment revealed a heterogeneous and patchy distribution of ecological habitats, shaped by both natural processes and industrial interventions. Key habitat

types identified include open grasslands, ash dyke vegetation, riparian and wetland ecosystems, tree-dominated zones, and urban settlement areas. Many of these habitats retain ecological potential, particularly the grasslands and tree cover areas, which act as critical buffers and biodiversity hotspots. These zones support a range of native and migratory species and perform vital ecosystem services such as carbon sequestration, air filtration, and microclimate regulation.

The ash dyke area, while partially vegetated, it was also found to host some opportunistic colonizers such as *Tamarix dioica*, which may offer ecologically beneficial by providing long-term structural stabilization. Similarly, greenbelt areas within the township show limited species diversity and lack multi-tiered canopy structure, which reduces their potential to act as effective ecological corridors. The riparian stretches near water bodies exhibited high biological activity but also signs of disturbance due to human access and discharge of human waste. Despite these challenges, the assessment confirms that with targeted habitat restoration and management, the NTPC landscape holds strong potential for ecological enhancement and biodiversity recovery.

Impacts on Flora, Fauna, and Habitats

This section highlights the potential ways in which thermal power plant operations may interact with local flora and fauna, drawing on findings from studies and reports of other thermal plants. Since this is a baseline study, the aim is to note all possible points of interaction — even those that may seem minor at present — so they can be monitored over time. This proactive approach will help in building a clear picture of NTPC's relationship with its surrounding environment and support informed decision-making to ensure long-term ecological balance. Activities like construction of infrastructure, vehicular movement, alteration of land surfaces, and emissions have contributed to the loss of native vegetation, introduction of invasive species, and fragmentation of habitats. Native plant communities are noted to be replaced or outcompeted by invasive or disturbance-tolerant species such as *Parthenium hysterophorus* and *Lantana camara*, indicating a shift in successional stages and reduced ecological stability.

Impacts on fauna are largely indirect, resulting from habitat degradation, noise, vehicular movement, and changes in water and soil quality. Sensitive and habitat-specific species such as ground-nesting birds, amphibians, and some aquatic fauna have shown reduced occurrence or shifting distribution patterns, especially in zones closer to high-activity areas. The ash dyke and surrounding wetland edges, while partially vegetated, show signs of species richness. The presence of species such as *Ficus religiosa*, *Azolla pinnata*, and sightings of Gangetic Dolphin, River Lapwing, and Greater Adjutant Stork demonstrate that the landscape retains significant ecological value, particularly along riparian and wetland corridors.

Environmental Impacts

The environmental quality assessment, supported by laboratory testing of water and soil samples, reveals notable impacts related to industrial activity, particularly in zones adjacent to the ash dyke, coal storage yard, and plant boundary. Water samples collected from surface bodies (e.g., ponds, nallahs, and Ash pond channel) showed the Biochemical Oxygen Demand (BOD) is within the permissible limit). When compared with previous monitoring data from NTPC's environmental

reports, the current values indicate persistent organic pollution despite some improvements in treated effluent quality. These parameters suggest eutrophication risk and deterioration of aquatic habitats, potentially affecting fish, aquatic invertebrates, and birds dependent on wetland systems.

Soil quality analysis, conducted at various locations including the ash dyke, township vegetation plots, and agricultural interface zones, revealed the presence of metals such as lead, cadmium, and chromium, especially in topsoil layers around the ash disposal area but the quantity was in below permissible limits. Additionally, soil from exposed dyke slopes exhibited low organic carbon, reduced nitrogen-phosphorus content, and compaction. A comparison with NTPC's earlier soil quality datasets shows consistent patterns in heavy metal presence, though minor improvements were noted in vegetated reclaimed patches. These results highlight the need for systematic soil reclamation to enhance soil health and promote successful restoration in degraded areas.

Current Mitigation Strategies by NTPC Kahalgaon

NTPC Kahalgaon has implemented several environmental mitigation strategies aimed at reducing the ecological footprint of its thermal power operations. Key measures include the development of greenbelts and avenue plantations using pollution-tolerant species to mitigate dust, noise, and heat, along with ash utilization practices that divert fly ash for use in cement and construction industries, thereby minimizing ash pond overloading. The plant operates effluent and sewage treatment facilities to ensure treated water meets discharge standards, and dust suppression systems are in place across coal handling areas. Air pollution control is addressed through regular stack emission monitoring and installation of Electrostatic Precipitators (ESPs), with plans for Flue Gas Desulphurization (FGD) units. Waste management protocols for solid and hazardous materials are followed in line with environmental compliance requirements. While these efforts contribute to environmental risk reduction, the current biodiversity assessment identifies opportunities to enhance these strategies by integrating ecological restoration, habitat-based interventions, and long-term biodiversity monitoring into NTPC's environmental management framework.

Recommendations and Mitigation strategies

The study presents a comprehensive set of recommendations and ecological mitigation strategies developed to address the biodiversity and environmental challenges identified during the study of NTPC Kahalgaon Super TSTPS. These strategies are adapted from global and national best practices implemented across thermal power plants and have been contextualized to suit the ecological, social, and operational characteristics of the Kahalgaon landscape.

- The study strongly emphasizes the expansion of afforestation and greenbelt development, recommending the use of a curated list of native tree, shrub, and herbaceous species. The proposed plantations are intended to enhance ecological resilience, create biodiversity corridors, and buffer air and noise pollution. Specific mention is made of applying the Miyawaki method to rapidly establish dense, multi-tiered vegetation with high carbon sequestration potential and microclimate regulation benefits.

- In recognition of NTPC Kahalgaon's proximity to the Vikramshila Gangetic Dolphin Sanctuary, the chapter recommends that NTPC commission a detailed scientific study on Gangetic Dolphin populations and aquatic habitat health. This would inform targeted conservation strategies and provide insights into the ecological linkages between NTPC operations and the sanctuary ecosystem.
- The recommendations also propose strengthening community awareness and participation through educational signage, species information panels, and biodiversity-themed programs in schools and villages. This participatory approach will build local stewardship and improve the visibility of NTPC's biodiversity initiatives.
- Lastly, in response to emerging regulatory requirements under the India's draft Greenhouse Gas Emission Intensity (GEI) Target Rules, 2025, NTPC may undertake a baseline carbon stock assessment across its operational and greenbelt zones. This will support the integration of carbon offset strategies into future land-use and afforestation planning.

To institutionalize biodiversity management, the study outlines a detailed Biodiversity Monitoring and Reporting Plan (BMRP). This plan includes the establishment of permanent plots, tracking of indicator species, use of GIS tools, and annual biodiversity audits. It is aligned with national and international biodiversity monitoring frameworks. Altogether, these recommendations reflect a science-based, landscape-sensitive approach that enables NTPC Kahalgaon to strengthen its environmental compliance, biodiversity stewardship, and long-term sustainability goals.

Conclusion

The biodiversity assessment at NTPC Kahalgaon reveals that the region, while impacted by industrial activity, still supports significant ecological value and restoration potential. Native vegetation, diverse fauna, and the site's proximity to sensitive ecosystems like the Vikramshila Gangetic Dolphin Sanctuary reinforce the need for responsible biodiversity stewardship.

Through a set of targeted, science-based recommendations—including native species restoration, greenbelt expansion, biodiversity monitoring, and community outreach—NTPC is well-positioned to enhance its ecological performance and contribute to India's environmental and climate commitments. The implementation of these actions will allow NTPC Kahalgaon to evolve into a model for sustainable, biodiversity-aware industrial operations.