

# **BIODIVERSITY CONSERVATION AND MANAGEMENT FRAMEWORK**

**Gujarat Resilient Cities Partnership:  
Ahmedabad City Resilience Project**

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**Prepared by**

**AHMEDABAD MUNICIPAL CORPORATION  
AND  
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### **Note:**

This document is approved vide resolution number: 136 dated 21/06/2022 by Municipal commissioner, Ahmedabad Municipal Corporation



## List of Abbreviations

<b>Abbreviation</b>	<b>Expansion</b>
<b>ABS</b>	Access and Benefit Sharing
<b>AMC</b>	Ahmedabad Municipal Corporation
<b>APD</b>	Assistant Project Director
<b>BCMF</b>	Biodiversity Conservation and Management Framework
<b>BMP</b>	Biodiversity Management Plan
<b>BOQ</b>	Bill of Quantities
<b>C&amp;D</b>	Construction and Demolition
<b>CHMP</b>	Cultural Heritage Management Plan
<b>DPR</b>	Detailed Project Report
<b>EHS</b>	Environmental Health and Safety
<b>ESCP</b>	Environmental and Social Commitment Plan
<b>ESIA</b>	Environmental and Social Impact Assessment
<b>ESF</b>	Environmental and Social Framework
<b>ESMF</b>	Environmental Social Management Framework
<b>ESMP</b>	Environmental and Social Management Plan
<b>ESS</b>	Environmental and Social Standards
<b>FGD</b>	Focus Group Discussions
<b>GBB</b>	Gujarat Biodiversity Board
<b>GoG</b>	Government of Gujarat
<b>Gol</b>	Government of India
<b>GPCB</b>	Gujarat Pollution Control Board
<b>G-ACRP</b>	Gujarat Resilient Cities Partnership: Ahmedabad City Resilience Project
<b>IEC</b>	Information Education Communication
<b>IPF</b>	Investment Project financing
<b>NGO</b>	Non-Governmental Organization
<b>NTAC</b>	Normally Traded as Commodities
<b>O&amp;M</b>	Operations and Maintenance
<b>OHS</b>	Occupational Health and Safety
<b>PD</b>	Project Director
<b>PDO</b>	Project Development Outcome
<b>PIU</b>	Project Implementation Agency
<b>PMC</b>	Project Management Consultant
<b>SCADA</b>	Supervisory Control and Data Acquisition
<b>SUDU</b>	Sustainable Urban Development Unit
<b>SHC</b>	Stakeholder Consultations
<b>STP</b>	Sewage Treatment Plant
<b>SWD</b>	Storm Water Drains
<b>SWM</b>	Solid Waste Management
<b>TA</b>	Technical Assistance
<b>ToR</b>	Terms of Reference

<b>Abbreviation</b>	<b>Expansion</b>
<b>TPD</b>	Tons per Day
<b>ULB</b>	Urban Local Body
<b>WB</b>	The World Bank

## GUJARAT RESILIENT CITIES PARTNERSHIP: AHMEDABAD CITY RESILIENCE PROJECT (G-ACRP)

### **BIODIVERSITY CONSERVATION AND MANAGEMENT FRAMEWORK**

#### **Executive Summary**

This Biodiversity Conservation and Management Framework (BCMF) is prepared following the requirements for the application of the Environmental and Social Standards (ESS 6: Biodiversity Conservation and Management of Living Natural Resources), of the World Bank's Environmental and Social Framework applicable to its Projects funded through Investment Project Financing (IPF). The ESS 6 is applicable for the G-ACRP as the project area is the city of Ahmedabad in Gujarat, with many man-made lakes, water bodies, and the region around the city has some biodiversity areas (25-50 km from the city). The Project will avoid supporting any subprojects which might impact critical habitats. The initially identified investments do not have an impact on any negative impact on critical or natural habitats but will have a beneficial impact on river Sabarmati by ensuring that the treated sewage discharged into it follows stringent standards. Since this is a framework-type project, it can be expected that some of the subprojects identified during the project duration may have an impact on biodiversity or living natural resources in or around the region.

This BCMF sets out measures designed to protect biodiversity throughout the project life-cycle, and the steps to prepare a full-fledged Biodiversity Management Plan (BMP) during subproject preparation. The measures for the implementation of this BCMF will also need to take into account the ESS 8 (Cultural Heritage) that recognizes the social and cultural values of heritage areas of the project sites, as in the case of sacred tanks/other waterbodies/groves. In addition, for inclusion, the BCMF will follow the provisions on Stakeholder Engagement Plan (SEP) prepared for G-ACRP and follow the requirement as set out in the ESS 10 (Stakeholder Engagement and Information Disclosure).

## 01. Background

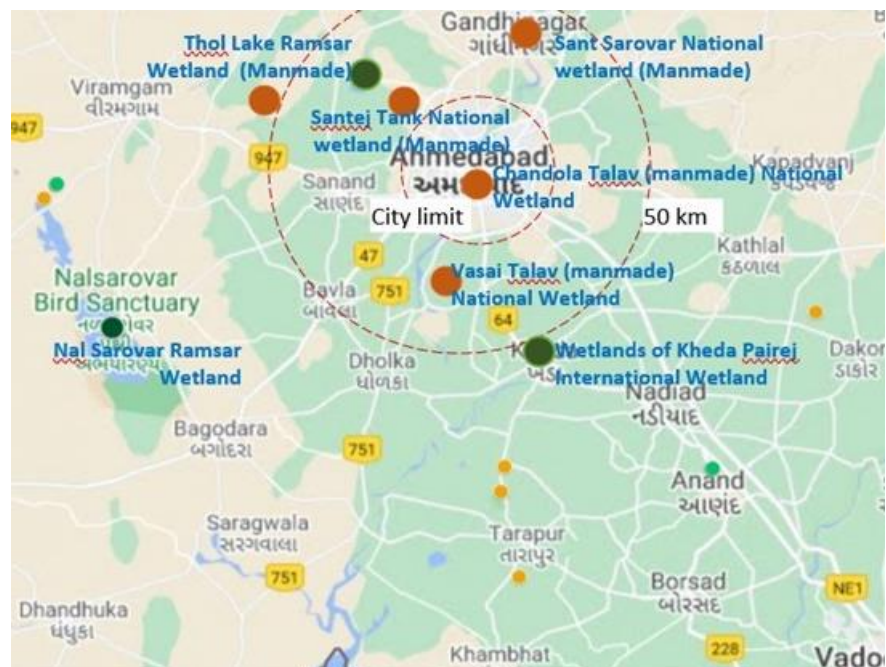
For the long-term sustainability of the project and its environment, it is important to ensure the conservation of biodiversity and natural habitats. Hence, the provision of methodology for the screening of sites and incorporation of mitigation measures in ESMF is deemed important. Also, specific sub-projects may have impacts beyond the project boundary on the natural habitats and biodiversity of the region, which is not known at this stage as all subprojects have not been identified.

Ahmedabad is an industrialized and commercial, dense metropolis. The proposed project involves mainly infrastructure development for sewerage and stormwater drainage (SWD) management to prevent water pollution and reduce Green House Gas (GHG) emissions by offering full centralized treatment as against treatment in individual septic tanks or disposing of in the water bodies or the open.

As per stage 1: Exclusions; all subprojects which may result in conversion or degradation of critical natural habitats and Forests are excluded. Considering that this is a framework type project and subprojects can come up in various parts of the city, which may be near biodiversity areas, it is proposed to develop Biodiversity Management Plan (BMP) at the subproject level as part of ESMF in case it is found through ESIA that its area of influence (maybe beyond the project footprint) includes any recognized or unrecognized biodiverse area (which is a natural or critical habitat) as a sensitive receptor. This is also applicable to all subprojects and Technical Assistance (TA) activities under the Gujarat Resilient Cities Partnership: Ahmedabad City Resilience Project (G-ACRP), as per ESMF.

## 02. Important areas for Biodiversity in and around Ahmedabad

There are no protected areas within 50Kms of the city, while two Key Biodiversity Areas (International Wetlands): Thol Sanctuary and Wetlands of Kheda occur around 25-50 km. While localized air and noise pollution may be expected during construction and operation stages around project footprints (STP and Drainage); this would not impact any key biodiversity areas, as such areas occur more than 10 km of the project locations and intervened by various other mixed landuses and activities. Water pollution would not impact key biodiversity areas which are at around 25-50 km of the city and not located downstream of the city/project facilities along Sabarmati or Khari.



**Figure 1: Sensitive Ecosystems in and around Ahmedabad City**

There are 122 man-made lakes in the city, one among which; namely Chandola Lake (located in a dense mixed-use neighborhood inside the city; to the east of Sabarmati) is recognized as a national

wetland. Though not a critical habitat, it welcomes migratory birds like cormorants, painted storks, and spoonbill birds; however the lake is polluted and modified with developments and encroachments, and wastewater/industrial effluent inflow from Kharicut Canal. Many seasonal birds also visit many other lakes in the city in a dense city labyrinth, filled with sewage, garbage, and industrial effluents. Though these manmade lakes are not recognized as natural habitats of these species, developments in such areas may need to mitigate any impact on these. Santej Lake is a manmade lake in the list of national wetlands close to the city; while Chandola *Talab* (Lake) in the city carries the same recognition. Sant Sarovar (north of the city) and Vasai Tanks (south of the city) also are in the national wetland register, but will not be affected by any subprojects in the city.

Sabarmati River passes through the city and is non-perennial and heavily modified due to the riverfront development, multiple impoundments along the stretch from Dharoi, and regional developments, and receiving waters from Narmada Canal (rather than natural flow from Dharoi dam upstream) since past 4 years for maintaining the water for aesthetics all around and recreation at the riverfront. The stretch of the river from Kheroj (upstream of Ahmedabad city) to Vautha (downstream of Ahmedabad) is demarcated as a critically polluted stretch by Central Pollution Control Board. The Khari river to which Kharicut Canal passes near the eastern part of the city and joins Sabarmati downstream near Vautha. The river is also polluted due to wastewater from the Kharicut Canal and the surrounding industrialized areas downstream of the city, and non-perennial.

In case of (i) subprojects to the north and western edge of the city which may impact Santej lake (within 10 km)<sup>1</sup>, (ii) in case of subprojects to the southeast of the city which may impact Chandola Lake (within 10 km); and (iii) in case of any other subproject which may impact any other Lake/tank which is significant in terms of biodiversity or near Zoo; it is proposed to prepare Biodiversity Management Plan as part of ESIA and includes in ESMP.<sup>2</sup> The plan will suggest measures to be implemented to protect natural habitats if any and to monitor mitigate and manage the impacts during construction and operations stages. In addition, any impacts on the rivers Sabarmati and Khari (modified<sup>3</sup> due to decades of dumping of wastes and wastewater, and absence of water during almost 9 months annually) will also be undertaken and mitigation measures adopted to prevent further degradation. All subprojects will discuss and ascertain impacts if any, on all listed key national/international recognized or unrecognized biodiverse areas.

In addition, any project which will have an impact on the following will prepare required mitigation measures in ESMPs: Public Parks – 256 numbers of 2240000 sqm area; around 0.7 million trees in the City, Area covered green space (around 5 of city area%), Municipal Nurseries, and Urban Forestry Sites.

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<sup>1</sup> As per national regulation, the maximum distance of noise monitoring locations is 2 km of project boundary, and Eco-sensitive Zone is demarcated at 10 kms from Protected Area Boundary. So if a sensitive area falls within distance of 10 kms from subproject location this will be analysed for impacts on air, noise. Since none of these falls downstream of the city, or discharge points of the STPs / drainage impacts water due to water pollution is not considered for arriving at the distance

<sup>2</sup> Detailed coverage of Biodiversity and Living Natural Resources in Ahmedabad and surrounding region is presented in Baseline Description in Annexure of ESMF Volume I.

<sup>3</sup> According to ESF, “modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area’s primary ecological functions and species composition”. This ESS applies to those areas of modified habitat that include significant biodiversity value, as determined by the environmental and social assessment required in ESS1. The Borrower will avoid or minimize impacts on such biodiversity and implement mitigation measures as appropriate.

### 03. Applicable policies, Laws, Acts, Rules, and Guidelines

Various National and State level policies/ laws and rules are applicable for Biodiversity management. Besides, the World Bank ESS 6 on Biodiversity Conservation and Living Natural Resources is applicable here. There are many National and State Laws, Rules, Acts that are important in this regard including

- India's National Biodiversity Action Plan under Convention on Biodiversity
- The Biological Diversity Act, 2002
- Forest Rights Act, 2006
- Forest (Conservation) Act, 1980 with Amendments Made in 1988
- Forest (Conservation) Act, 1980 Rules & Guidelines
- The Gujarat Private Forests Act, 1972
- The Indian Forest Act, 1927
- The Environment (Protection) Act, 1986
- The Indian Wildlife (Protection) Act, 1972
- Gujarat Biological Diversity Rules, 2010
- The Biological Diversity Rules, 2004
- The Environment (Protection) Rules, 1986
- The Wildlife (Transaction and Taxidermy) Rules, 1973
- Forest (Conservation) Rules, 2003
- Forest (Conservation) Rules, 1981
- Normally Traded as Commodities (NTAC) Notification, 2016
- Access and Benefit Sharing (ABS) Guidelines, 2014
- Reconstitution of Gujarat Biodiversity Board
- Handbook of Forest (Conservation) Act 1980, Rules 2003, Guidelines & Clarifications
- India's Action Plan for Wildlife Conservation and Role of Voluntary Bodies
- National Conservation Strategy and Policy Statement on Environment and Development
- Evolution of National Forest Policy in India

Key facts are as below:

<b>Policy/ Act</b>	<b>Description</b>
The Biodiversity Act 2002 and Gujarat Biological Diversity Rules, 2010	<p>Established Biodiversity Authorities and Funds at Center and States</p> <p>Constituted Biodiversity Committees: Every local body shall constitute a Biodiversity Management Committee within its area to promote conservation, sustainable use, and documentation of biological diversity including preservation of habitats, conservation of landraces, folk varieties and cultivars, domesticated stocks, and breeds of animals and microorganisms and chronicling of knowledge relating to biological diversity</p> <p>Prohibits any person from collecting or accessing biological resources for commercial purposes without approval of Authority.</p> <p>Prepare, maintain and validate People's Biodiversity Register (PBR) in consultation with local people. The BMC is to maintain a Register giving information about the details of the availability and knowledge of local biological resources, their use or any traditional knowledge, access to biological and traditional knowledge granted, details of the collection of the fee imposed, and details of the benefits derived and the mode of their sharing. BMC will ensure management of heritage sites, sacred water bodies, groves, etc; conserve traditional breeds of animals, plants, and education, awareness building.</p>



Policy/ Act	Description
Wildlife Protection Act, 1972	<p data-bbox="496 248 1145 277">Applicable to important biodiverse areas in the project area</p> <p data-bbox="496 297 1370 421">The Wildlife Protection Act, 1972 has allowed the government to establish several Protected Areas like National Parks and Sanctuaries over the past 37 years, to protect and conserve the flora and fauna and their habitat. Prior recommendation of the National Board for Wildlife (NBWL) will be required</p> <ul data-bbox="496 443 1370 633" style="list-style-type: none"> <li>• in case any activity is proposed within the boundaries of a Protected area</li> <li>• in case any project requiring Environmental Clearance (under the purview of EIA Notification 2006 and its subsequent amendments) is located within the eco-sensitive zone around a Wildlife Sanctuary or National Park or in absence of delineation of such a zone, within a distance of 10 km from its boundaries</li> </ul>
Forest (Conservation) Act, 1980	<p data-bbox="496 640 1370 696">This is not applicable as there are no protected areas in the project area, and none of the project activities falls under EIA Notification 2006.</p> <p data-bbox="496 707 1370 931">The Indian Forest Act (1927) was amended in 1980 in an attempt to check the rapid deforestation occurring throughout India and the Forest (Conservation) Act, 1980 came into existence. At the state level, the government was empowered to declare reserves and protected forests and was also given the authority to acquire land for the extension and preservation of the forests. Forest (Conservation) Rules, 2003 explain the procedure for procuring clearance for diversion of forest land for non-forest purposes.</p> <p data-bbox="496 954 1370 1070">Prior Forest Clearance under the purview of this act will be required in case use/diversion (for long term or short term) of forest land is involved in the project. However, this is not applicable for the project as there are no Protected Forests in the Project area</p>
Wetlands (Conservation and Management) Rules, 2017 & Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017	<p data-bbox="496 1099 1370 1357">Wetlands (Conservation and Management) Rules, 2017 are promulgated under the Environmental (protection) Act, 1986 for prohibiting reclamation and degradation through drainage and landfill, pollution (discharge of domestic and industrial effluents, disposal of solid wastes), hydrological alteration (water withdrawal and changes in inflow and outflow), over-exploitation of their natural resources resulting in loss of biodiversity and disruption in ecosystem services provided by wetlands by conservation of wetlands. The rules shall apply to the wetlands or wetlands complexes of the following types-</p> <p data-bbox="496 1379 1370 1514">(a) wetlands categorized as 'wetlands of international importance under the Ramsar Convention (b) wetlands as notified by the Central Government, State Government, and Union Territory Administration</p> <p data-bbox="496 1536 1370 1592"><b>Section 4</b> of the rule elaborates Restrictions of activities in wetlands which includes solid waste dumping and any construction of a permanent nature</p> <p data-bbox="496 1615 1370 1671">Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017 provides detailed categorization for wetland classification.</p> <p data-bbox="496 1693 1370 1753">This will apply to works on Tanks / Lakes, Kharicut Canal, and Chandola Lake which is a national wetland</p>
Saurashtra Felling of Trees (Infliction of Punishment) Act, 1951	<p data-bbox="496 1783 1370 1872">An Act to provide for heavier punishment for felling of trees and for certain other matters Whereas it is expedient to provide for heavier punishment for the unauthorized felling of trees and certain other matters</p> <p data-bbox="496 1895 1370 1951">Applicable for all protect involving tree cutting/disturbance to trees and other flora</p>

## 04. Probable Risks and Impacts

Some of the subproject activities might require site clearance, minor excavations, and construction in or near an important biodiverse area. The primary objective of the framework is to avoid any activities which might impact important Biodiversity areas, and minimize, mitigate and manage risks and impacts due to unavoidable activities/risks.

The project construction activities in (Eg: redevelopment of Tanks) or near biodiversity-rich areas (near network development near Santej Lake, Chandola Talav) may have an impact on valuable ecological resources/habitats and thus project activities are required to be screened for conservation and management, including :

- Loss of vegetation
- Disruption to faunal movement
- Disruption to Avi Fauna
- Threat to rare, endangered, and threatened species if any

The biodiversity management plan should:

- Present details of species/habitats to be protected
- Ensure compliance with applicable legislation
- Outline requisite biodiversity protection and enhancement measures with the stage of project activity viz planning stage, construction stage, and operation stage
- Defined responsibilities with allocated budget for responsibility for action

## 05. Guidelines for Assessment and Indicative Mitigation Measures

The biodiversity and environment management plan will be developed for avoidance or mitigation of threats to biodiversity arising from their operations. The following activities will be carried out for assessing biodiversity impacts:

- Habitat goals and objectives must be identified and prepared, examine ways to minimize disturbance and possible problems for key species; examine how the ecological value of the site may be improved by changes in land management, and increase overall biodiversity through management targeted at specific species
- Detailed site survey of proposed location, study of flora and fauna, areas of significant biodiversity value, critical habitat assessment if found applicable
- In the habitat assessment, habitats shall be categorized as Modified habitat, Natural Habitat, and Critical Habitats
- Invasive species in the project areas shall be identified and a species-specific management plan shall be suggested as a part of BMP
- Identify the presence of Rare, Endangered & Threatened species and suggest species-specific mitigation measures of the management plan
- Identify species listed under the schedules of the Wildlife Protection Act, 1972 and suggest species-specific mitigation measures of the management plan
- Feeding guild of the birds in the project area shall be considered suggesting green area development i.e. in case of the presence of frugivorous birds native fruiting trees shall be planted, in case of presence of more granivores birds, native grasses shall be maintained
- Baseline studies shall be carried out comprising a combination of literature review, desktop analysis, stakeholder engagement and consultation, in-field surveys for the proposed project area, and its project area of influence. Literature review shall include sources such as peer-reviewed journals, regional assessments, national or regional planning documents such as National Biodiversity Strategy and Action Plan (NBSAP) and Local Biodiversity and Action Plans

(LBAPs), existing assessments, and studies in the project site and its area of influence, web-based data such as provided in the International Union for Conservation of Nature (IUCN) Red list, etc.

- Stakeholder discussions consultations (SHC) follows the Stakeholder Engagement Plan (SEP) for the project and engagement shall consider project-affected communities and livelihood dependence of communities on natural resources, government officials, academic and research institutions, any indigenous species, recognized external experts for biodiversity attributes of concern, national and international NGOs, etc. BMC and Gardens Department (Zoo Department in case the sub-projects near the zoo) of AMC shall be involved in reviewing the screening checklist for projects. In case the impact assessment identifies biodiversity/habitat disturbances, mitigation measures shall be reviewed by BMC and Gardens Department (Zoo Department in case the sub-projects near the zoo).
- During stakeholder consultation dependence of communities on biological resources shall be identified, if any (ie. Rearing of plants, animals, harvesting fish/fisheries, etc.).

Spatial data and landscape mapping shall include land classification and land use maps, satellite imagery or photographs, vegetation type and ecosystems maps, rare fauna/ flora, etc. Once the impacts on biodiversity are evaluated, appropriate mitigation measures will be suggested. The proposed mitigation plan shall consider:

- Identification and mitigation of any direct and indirect project-related impacts on biodiversity including significant residual impacts. It shall consider habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, and pollution.
- The mitigation plan should consider all anthropogenic disturbances to fauna; Cutting of trees or any other change to natural habitat shall be carried out after consultations with relevant stakeholders including affected communities. Appropriate plantation shall be taken up giving more importance to native/indigenous species in consultation with BMC, Forest Department, and other relevant stakeholders including hosts.
- The mitigation measures should be designed to achieve a minimum loss of biodiversity – precautionary measures to avoid direct impacts, mitigation actions for other impacts:
  - Avoid or minimize impacts on biodiversity and related aspects throughout the project
  - Implement measures to avoid habitat fragmentation
  - Restore habitat during and/ or after operations
  - Restore/support livelihoods dependent on natural resources, and heritage values associated with such resources
- Additional mitigation measures while carrying out construction/operations like degradation of habitat quality (from air/water pollution or temperature change, light or noise pollution, habitat fragmentation) or introduction of invasive alien species; and vulnerability to fire or other stresses; through dust control, noise control, smoke control, fire control, soil management, consultations, etc.
- Projects which may result in conversion or degradation of natural habitats or disturbance to biodiversity are excluded from G-ACRP (Stage 1 Exclusions).

## 06. Contents of the Biodiversity Management Plan

The broad *Table of Contents* of the Biodiversity plan to be developed by the contractor for achieving above stated objectives can be on the following lines

- Introduction and Objectives of the Plan

- Sub Project Description: Details on the type of subprojects, influence areas, activities / including associated facilities with detailing of schedule and duration of construction, labor force to be employed, need of labor camp and likely location and its distance from biodiversity areas
- Inventory of Terrestrial and Aquatic Flora Fauna: Details of Rare, endangered, and threatened species if any, Habitat Type, Population and movement route of schedule I species, possible conflicts
- Probable risks and impacts of subproject activities on Biodiversity areas: Details of activities which are likely to interface with flora/fauna such as generation of high noise, physical disturbance due to works on water or nearby areas, transportation of raw material, labor camps, and laborers activities, existing disturbances in addition to the ones caused by the project
- Application of Regulations: Legal status of biodiversity areas and compliance requirements, need for permissions, documentation, stakeholder discussions
- Management plan: Measures for avoiding impacts on biodiversity, minimizing, mitigating, and managing possible impacts and risks (eg: control on noisy activities in certain locations, the timing of construction, lighting restrictions, areas to avoid – such as nesting, brooding, spawning areas), enhancement of biodiversity and supportive environment during preconstruction, construction and post-construction stage, including general guidelines for workers for prevention of poaching and protection areas as a whole
- Implementation Schedule for BMP taking into account the planned timing of construction and other project activities
- Institutional Responsibilities for Implementation, Supervision, Monitoring, Reporting
- Monitoring, Compliance reporting, and budget for BMP implementation, including up-front investment costs and long-term recurrent costs. The BMP also specifies the funding sources for plan implementation as well as recurrent operating costs

### 07. Indicative Mitigation Measures

Indicative BMP is presented here. This shall be updated, and suitably modified to include location-specific impacts and mitigation measures once the sites and interventions are identified.

**Table 1: Indicative Biodiversity Management Plan to be included in ESMP**

Possible Threats	Major Impacts	Suggested Mitigation Measures	Responsible Agencies
Deposition of silt/ earth derived from site clearing, excavations on natural habitat – biodiverse areas/ wetlands	<ul style="list-style-type: none"> <li>• Damage to wetland habitats, ponds, water bodies</li> <li>• Reduction in wetlands/ natural areas</li> </ul>	<ul style="list-style-type: none"> <li>• Do not allow silt/ earth disposal in wetlands, nearby water bodies, or low-lying areas</li> <li>• Identifying alternate disposal sites and material stacking areas and arranging for adequate cover and covered transportation</li> </ul>	Contractor, AMC
Draining out of wetlands along with the reduction of waterlogged areas through the improved drainage network	<ul style="list-style-type: none"> <li>• Damage to wetland habitats through drying of wetlands</li> <li>• Reduction in aquatic biodiversity</li> <li>• The threat to nesting and feeding grounds of resident avifauna and</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare GIS-based inventory</li> <li>• Inventorying the smaller ponds and wetlands that serve ecological purposes to precede site/drainage works</li> <li>• Mapping should cover smaller and lesser-known wetlands and not be confined only to larger water bodies and/ or those wetlands that are legally protected</li> </ul>	Contractor, AMC

Possible Threats	Major Impacts	Suggested Mitigation Measures	Responsible Agencies
	<p>impacts on migratory bird species</p> <ul style="list-style-type: none"> <li>• Encroachment on drained out wetlands</li> <li>• The threat to small ponds, wetlands in and near subproject areas and associated impact on economic returns from these to the poor and vulnerable population</li> </ul>	<ul style="list-style-type: none"> <li>• No link and main drains to pass through existing wetlands and wherever required an alternative route to be developed</li> <li>• If there is any outfall of main drains within 200 m of an existing wetland, take regular samples (3 months) for assessing drain water quality</li> <li>• Undertake water quality tests for established large water bodies/ wetlands nearby to check for residual pesticides/ chemicals</li> <li>• Low-lying ponds with important economic uses, such as fishing and/ or cultivation of aquatic plants and local temple ponds serving the community should not be drained or polluted due to subproject activities.</li> <li>• Identify possible engineering interventions required for controlling the inlet/ outlet of drains to ensure necessary levels of water in the wetlands/lakes</li> <li>• Wherever required install sluice gates or other hydraulic interventions to regulate required flow and maintain water quality in rehabilitated drains</li> <li>• No concretization of lake edges and bottom shall be carried out</li> </ul>	
Impacted habitats due to project activities	<ul style="list-style-type: none"> <li>• Due to the increased amount of nutrients/ organic matter through cut off drains, weeds and other invasive species may invade and disrupt native plant communities</li> <li>• A decline in fish population and other aquatic fauna</li> <li>• Drained out wetlands</li> <li>• Loss of individuals, permanent loss of nesting sites of birds, foraging habitats, and disturbance to habitat corridors.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that wetlands/ ponds/ lakes that may get drained are restored</li> <li>• Boundary delineation and demarcation without affecting natural drainage pattern</li> <li>• Restore damaged wetlands, ponds, low-lying areas, habitats, as required.</li> <li>• Increase monitoring arrangements for water quantity, quality, and biodiversity parameters</li> <li>• Eliminate invasive species and reintroduce native biodiversity</li> <li>• Habitat restoration if required to be undertaken in consultation with technical experts and consultation with BMC, Gardens Department, and Forests</li> <li>• Monitor site stormwater drain outflow and provide tertiary treatment for these or reuse/ recycle</li> <li>• Avoidance of vegetation clearance works during the bird nesting season.</li> <li>• Creation of suitable terrestrial habitats, such as grassland and woodland.</li> <li>• Focus on nature-based solutions</li> </ul>	AMC, BMC/Gardens/Zoo Department, Contractor

Possible Threats	Major Impacts	Suggested Mitigation Measures	Responsible Agencies
Disturbances to Fauna Flora due to site activities and associated activities	<ul style="list-style-type: none"> <li>• Fauna/ flora moving out of the areas nearby disrupting overall ecology</li> <li>• Accidents to animals/ birds</li> </ul>	<ul style="list-style-type: none"> <li>• Information to households regarding the site activities and restrictions to domesticated animals entry to the site.</li> </ul>	Contractor
Disturbance to Flora & Fauna due to workers camp	<ul style="list-style-type: none"> <li>• Fauna/ flora moving out of the areas nearby disrupting overall ecology</li> <li>• Accidents to animals/ birds</li> <li>• Hunting &amp; Poaching by workers</li> <li>• Increased movement of stray dogs and cats</li> </ul>	<ul style="list-style-type: none"> <li>• Awareness programs shall be arranged for workers</li> <li>• Restriction on hunting and poaching of fauna including waterbirds</li> <li>• Restriction on movement of stray dogs in the workers camp</li> <li>• Appropriate solid waste management to avoid any conflict with wild fauna and keep stray dog movement in control</li> </ul>	Contractor
Inclusion of exotic/ invasive species in plantation activity/ green belt development	<ul style="list-style-type: none"> <li>• Disturbance to the ecological balance</li> <li>• Loss of naïve flora</li> </ul>	<ul style="list-style-type: none"> <li>• Preference to the native plants shall be given</li> <li>• Removal of existing invasive species from the plant area</li> <li>• Careful disposal of recovered earth wastes to prevent issues due to invasive seeds/species</li> </ul>	Contractor
Risks and impacts due to disposal of treated sewage and drainage, C&D / other wastes, and sludge	<ul style="list-style-type: none"> <li>• Deterioration of water quality</li> <li>• Loss of biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid/minimize the discharge of untreated wastewater, bypasses</li> <li>• Discharge standards shall be strictly followed and monitored using Supervisory control and data acquisition (SCADA) system</li> <li>• Mechanisms for proper storage, treatment, and disposal of all wastes including Sludge, screenings, and C&amp;D wastes</li> </ul>	Contractor: to be monitored strictly also by Contractor, AMC, GPCB

## 08. Monitoring and Institutional Aspects

The Government of Gujarat has established Gujarat Biodiversity Board (GBB) to conserve biodiversity in the State. AMC has a Gardens Department which develops gardens and takes care of trees and urban forestry.

This framework includes the screening framework, process to prepare BMP while finalizing the interventions at each location. At the project preparation stage, it is important to prepare the BMP as part of ESIA in case project screening identifies the possibility of an impact on natural habitat or biodiversity. BMP be prepared in consultation with the Biodiversity Management Committee (BMC) (when constituted) and Gardens Department (Zoo Department in case any sub-project is near the zoo or similar landuses) of the AMC. The methodology to prepare the BMP is provided in the following **Section 05**. Biodiversity of the area shall be studied as part of Environmental and Social Impact Assessment and BMP shall be included as part of ESMP. It is suggested that the biodiversity expert of PIU (SUDU)/ PMC shall review the BMP while reviewing the ESIA following ESMF procedures. This shall also be shared with the World Bank for review. During implementation, BMP implementation will be monitored by PIU, PMC, and Gardens Department/BMC of AMC. Indicative Terms of Reference for Biodiversity expert at PMC is presented in Appendix 1.

During implementation, the Contractor will share the BMP monitoring reports with PMC and PIU regularly. PIU in turn will include monitoring of this in the quarterly progress reports submitted to the World Bank as part of ESMP / ESCP progress monitoring. Compliance and any incidents including man-animal conflicts at all sites shall be reported in the subsequent quarterly monitoring report.

## **09. Way Forward**

This framework is the BCMF for G-ACRP. This will be consulted with the public along with ESMF consultations and updated in case required in agreement with the Bank in case of any changes in the regulations, or as required.