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Local Biodiversity Strategy and Action Plan (LBSAP) for

Noida



Prepared Under HCL Foundation Supported Project entitled “Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida”.

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Message

ओखला पक्षी विहार

OKHLA BIRD SANCTUARY

GAUTAM BUDDHA NAGAR

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List of Abbreviations

ACE	Autonomous Community Efforts
BGIR	Botanic Garden of India Republic
BMC	Biodiversity Management Committee
°C	Degree Celsius
CBD	Convention on Biological Diversity
CCA	Community Conserved Area
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNCR	Central National Capital Region
COP	Conference of Parties
GEF	Global Environmental Facility
GIS	Geographic Information System
ha	Hectare
JFM	Joint Forest Management
JFMC	Joint Forest Management Committee
km ²	Square Kilometer
LBSAP	Local Biodiversity Strategy and Action Plan
MoEF	Ministry of Environment and Forests
NBAP	National Biodiversity Action Plan
NBSAP	National Biodiversity Strategy and Action Plan
NBSAP	State Biodiversity Strategy and Action Plan
NCR	National Capital Region
NGO	Non-Governmental Organisation
NOIDA	New Okhla Industrial Development Authority
NVY	Nagar Van / Vatika Yojana
SFM	Sustainable Forest Management
SG	Sacred Grove
sq. km.	Square Kilometer
TEEB	The Economics of Ecosystems and Biodiversity
UN	United Nations



Executive Summary

The Local Biodiversity Strategy and Action Plan (LBSAP) for the city of Noida articulates through the method by which to implement the vision, strategic objectives and actions necessary for conservation and protection of biodiversity in the city. The LBSAP is a tool, with which local governments (Noida Authority in this case), its various departments, and the local community can work together to deliver continued action for biodiversity stewardship.

This LBSAP is based on the inputs received during multiple consultation meetings at the city with a wide array of stakeholders. The LBSAP of Noida comprises of six chapters. The first chapter on introduction deals with the background, scope, objectives, methodology and format of the LBSAP. The second chapter provides a brief profile of the city of Noida. The third chapter deals with biodiversity of Noida city. The fourth chapter highlights major policies/strategies/legislations that are related to biodiversity conservation at the national and local levels. The fifth chapter deals with various achievable actions under separate goals for the maintenance, conservation and sustainable use of biodiversity under each focus area or ecosystem. The sixth chapter provides a glimpse of various major tools that can support the implementation of LBSAP in Noida.

The LBSAP of Noida sets out a framework and a plan of action for conservation and sustainable use of biological diversity and equitable sharing of benefits derived from this use. It provides an overview of key issues, constraints and opportunities, identified during the extensive consultation meetings carried out with various stakeholders in the city.

The city has defined its LBSAP vision as '**Noida envisions a future where ecological conservation is seamlessly integrated with economic growth, creating an inclusive, sustainable and resilient city that fosters prosperity for all its inhabitants, prioritising holistic protection and restoration of ecosystems**'. The city has also identified seven focus areas. This LBSAP suggests appropriate actions, comprising of both soft and hard measures to address issues faced in each of these focus areas



1. Introduction

1.1. Background of LBSAP

An LBSAP is a guiding strategy with specific actions suggested for the local governments¹ to achieve “optimal and realistic governance and management of biodiversity and ecosystem services” (Avlonitis et al., 2012). An LBSAP, in essence, is the local equivalent of National and State Biodiversity Strategy and Actions Plans (NBSAPs and SBSAPs- refer Annexure 8.2). The NBSAP is the primary instrument of the national governments for implementing the Convention on Biological Diversity (CBD). The Conference of Parties (COP) to the Convention on Biological Diversity (CBD COP 10) has recognized LBSAP in the decision X/22 (Convention on Biological Diversity, 2010).

1.2. Scope and Objectives of LBSAP

An LBSAP is useful for local governments in many ways. LBSAP is more specific in terms of actions and deadlines when compared with NBSAP and SBSAP. The LBSAP helps in translating international and national biodiversity policies and targets into implementable action plans at the local level.

1.3. Methodology Used in the Preparation of LBSAP

A participatory and scientifically informed approach was followed for the development of the LBSAP of Noida (refer Figure 1).

1.3.1. Consultation Workshops

Consultation meetings at the city level were carried out with different stakeholder groups, in 2023. These included meetings with Resident Welfare Associations , academicians and researchers (refer Annexure 8.3). The city level workshop, which brought together a wide of array of stakeholders, including NGOs, subject matter experts, academicians, citizens was carried out on 7th March 2024. In this workshop, critical ecosystems (Focus Areas) within the city were identified and the current health status of those ecosystems was discussed and ranked on a scale from Very Good to Very Poor. Following this, prioritization of the drivers that impact the health of the ecosystems was carried out. This information formed the foundation for the development of the LBSAP. Annexure 8.3 provides more details.

1. Local government could be any government body under the state. However, here the term is used to denote the city government.

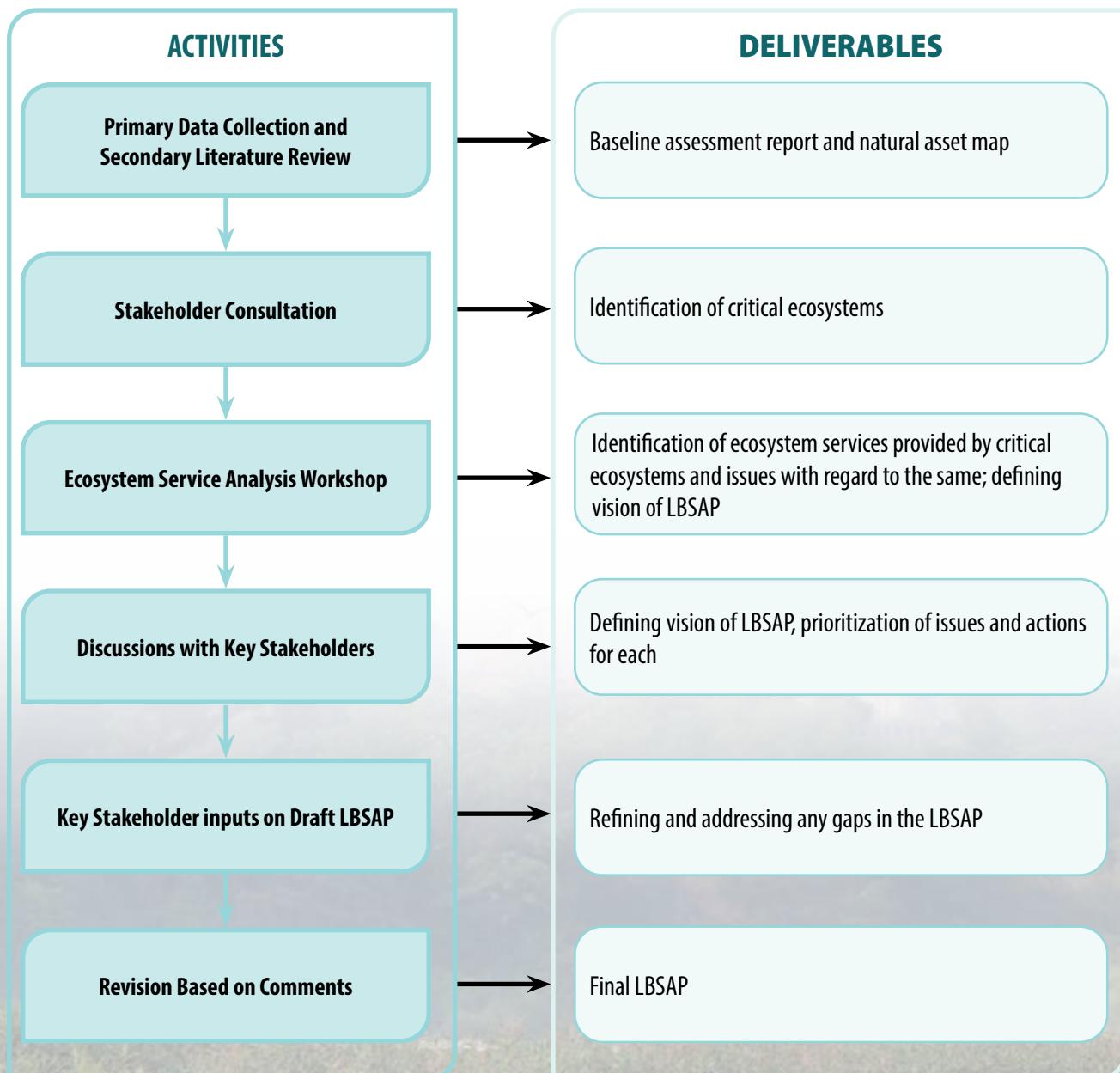


Figure 1: LBSAP development process

1.4. Format of LBSAP

The LBSAP of Noida is divided into six chapters. The introductory chapter provides a background to LBSAP, scope and objectives, methodology used, and format of the LBSAP. The second chapter discusses the city profile of Noida. The third chapter deals with biodiversity profile of the city of Noida. The fourth chapter discusses various policies and laws related to biodiversity and environmental governance at the international, national, state and city level. The fifth chapter deals with the vision, guiding principles, focus areas, various strategic goals and actions related to each focus area. The sixth chapter provides a glance of various major tools that can support the implementation of LBSAP in Noida.

2. City Profile Noida

New Okhla Industrial Development Authority, popularly called as Noida, is a planned city in the Gautam Buddha Nagar district in the state of Uttar Pradesh. It lies between the coordinates $28^{\circ}18'12.54''$ to $28^{\circ}22'36.72''$ northern latitudes and $77^{\circ}10'28.97''$ to $77^{\circ}15'19.83''$ eastern longitudes (Mohan, 2009). Noida is spread over an area of 235 sq.km, at an elevation of 200 metres above sea level. It is situated at a short distance of 5 km from New Delhi, in the Trans-Yamuna area. The city is bound on the north-east, east and south-east by the River Hindon, on the west and south-west by the River Yamuna and on the north and north-west by Delhi and Ghaziabad respectively. It is enclosed under the catchment area of River Yamuna, which is composed of the rich river alluvium called khadar. The city falls within the Central National Capital Region (CNR) policy zone of the National Capital Region (NCR) (Sinha, 2018). It emerged as a satellite city of the capital of India, New Delhi, for the first time in 1991.

2.1. Population

According to Census of India 2011 report (Government of India, 2011), population of the city of Noida is 637,272. The total number of males are 349,397 and the total number of females are 287,875. Average literacy rate of the city is as high as 86.53%.

Hinduism is the most widely practised religion in the city of Noida (Government of India, 2011). There are 553,545 (86.86%) Hindus while Islam is the second most widely followed religion with approximately 8.55% people practising it. Other religions include Sikhism followed by 1.11%, Buddhism followed by 1.11%, Christianity by 0.86%, Jainism by 0.54%, around 0.01% under 'Other Religion' and 1.98% stated 'No Particular Religion'.

2.2. Environmental Context

Noida experiences a hot and humid type of climate (Greater Noida Web, n.d.). Summers last from March to June with maximum temperatures of up to 45°C . Monsoon season begins in July and continues till the end of September. The city receives approximately 93cm precipitation, yearly. Heat and humidity levels are high during the monsoons. Mild winters start to set in October. Temperatures drop to as low as 3°C in December-January. The city also receives winter rainfall in the month of February due to western disturbances.

The topography of the area under the city is plain with a gentle slope ranging between 0.2-0.1 percent from north-east to south-west (New Okhla Industrial Development Authority,

Box 1: New Okhla Industrial Development Authority Vital Statistics



Area

235 km²

Population

637,272 people
(Census 2011)

Population Density

2463 persons/km²

Climate

Noida experiences a hot and humid type of climate. Summers last from March to June with maximum temperatures of up to 45°C . Monsoon season begins in July and continues till the end of September. Temperatures drop to as low as 3°C in December-January.



Main land cover and land uses

Built-Up (60.89%), Vegetation (14.25%), Agriculture (10.00%), Open and Fallow Land (13.12%), Water/river (1.74%)

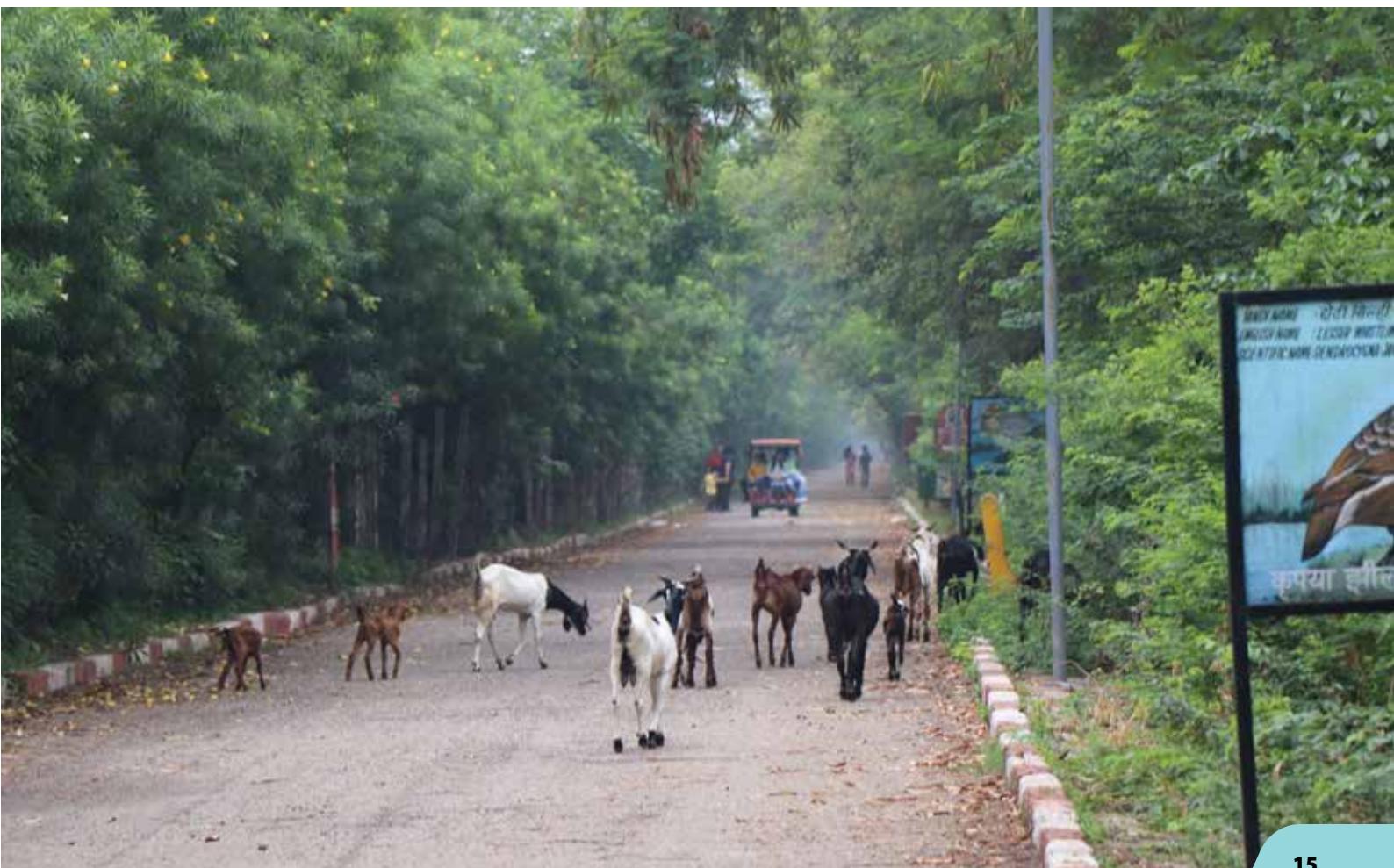
2011). The maximum and minimum altitude varies from 204 meters above mean sea level near Parthala Khanjarpur village in the north-east to 195 meters above mean sea level near Garhi village in the south-western region of the city. Overall, the city of Noida is 200 meters above mean sea level and is located at a lower elevation than the general level of the area as well as the flood level plain of River Yamuna. Consequently, the city is not well-equipped for effective storm water and sewage disposal.

2.3. Socio-Economic and Cultural Context

Noida is a rapidly urbanising city, forming a large part of the NCR (Sharma et al., 2021). The city is home to many corporate offices, residential buildings and commercial area. For the last several decades, Noida has grown rapidly with many construction activities taking place such as the building of skyscrapers, high rise housing apartments, setting up of new factories and the development of metro rail line across the entire city. The city has also witnessed extensive infrastructure development, for example, construction of Yamuna Expressway, the Rashtriya Dalit Prema Sthal, Indian motor racing circuit, and Green Garden.

Since its inception in 1976, the city of Noida has grown tremendously well in various sectors including services, business enterprise and real estate (New Okhla Industrial Development Authority, 2011). As per data from 1991 (New Okhla Industrial Development Authority, 2011), about 29.47 percent of total workers comprised of industrial workers, 14.54 percent were employed in trade and commerce, 9.11 percent in construction and 4.22 percent in transport and communication. However, these figures declined drastically within a decade's time as the workforce shifted employment to manufacturing units and industries. A large proportion of the population is engaged in agricultural activities given the notified area under the city of Noida has predominantly been agricultural in nature.

Being in close proximity to the capital of Delhi, Noida is considered a favourable destination for young entrepreneurs, investors and settlers and by 2010, about 1267 hectares of industrial land was fully established (New Okhla Industrial Development Authority, 2011). The city attracts both domestic and international tourists for its cosmopolitan fabric as well as opportunities in sports and recreation.



3. State of Noida's Biodiversity

Vegetation in Noida falls in the category of sub-tropical deciduous type however, the city does not possess any natural forests (New Okhla Industrial Development Authority, 2011). Noida is marked with the characteristic presence of various tree species found in large swathes of agricultural fields such as Shisham (*Dalbergia sissoo*), Mango (*Mangifera indica*), Jamun (*Syzygium cumini*), Imli (*Tamarindus indica*) and Babul (*Vachellia nilotica*). Scrubby vegetation found in the region is Arua (*Ailanthus excelsa*), Hina (*Lawsonia inermis*), Madar (*Calotropis gigantea*), Karauda (*Carissa carandas*) and Mako (*Solanum nigrum*).

An important remnant natural habitat in the city is the wetland under Okhla Bird Sanctuary which has a population of 14,000-20,000 water birds and about 115 plant species belonging to 43 families (Manral et al., 2013). The wetland is a vast alluvial plain, located in the catchment area of river Yamuna, spread across an area of 400 ha with ponds, shallow vegetated areas, reed and sand beds covering 97 ha. Vegetation characteristic of reed beds include *Typha angustata* and *Phragmites maxima*. Submerged vegetation includes *Vallisneria spiralis*, *Hydrilla verticillata*, *Potamogeton pectinatus*, and *Najas sp.* Trees and shrubs like *Tamarix dioica* and *Ficus sp.* occur along with *Ipomoea carnea* (Gopal & Sah, 1993). The Sanctuary plays a significant role as a breeding and feeding site for the water birds.

3.1. Natural Asset Map

The natural asset map of Noida was developed by ICLEI South Asia (Figure 2). Of the natural and urban green spaces present, paddy cultivation occupies the largest area, making up 20.66% of the city's land use followed by area under river (5.34%) and mixed cultivation (4.58%). Table 1 provides details of each land class. The natural asset map has also been used to develop the illustrated natural asset map (Figure 3).

Table 1: Area of Natural Assets within the city of Noida boundaries

Sl. No.	Land class	Area in Ha	Area Percentage
1	River	1305.97	5.55
2	Riverine Vegetation	248.06	1.05
3	Natural Vegetation (Forest)	582.77	2.48
4	Marshes	136.47	0.58
5	Restored Forest	3.75	0.02
6	Okhla Bird Sanctuary	164.04	0.70
7	Sparse Vegetation	752.45	3.20
8	Urban Forest	140.45	0.60
9	Ponds	68.44	0.29
10	Tree Patches	570.94	2.42
11	Open Green Spaces	750.09	3.19
12	Golf Course	108.15	0.46
13	Open Ground	387.95	1.65
14	Paddy Cultivation	4865.13	20.66
15	Mixed Cultivation	1077.90	4.58

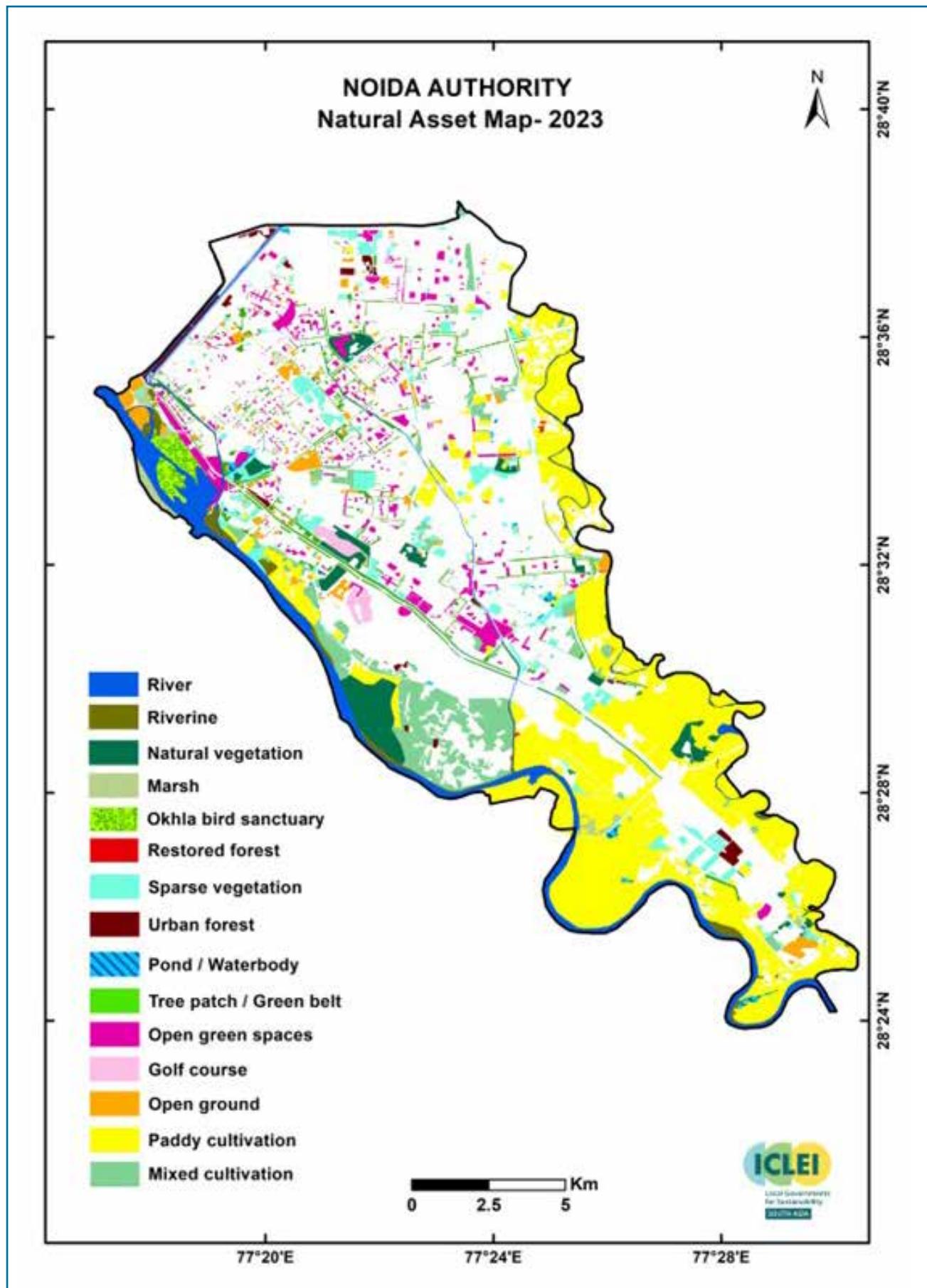


Figure 2: Natural Asset Map of Noida



Figure 3: Illustrated Natural Asset Map of Noida

3.2. Flora

Botanic Garden of Indian Republic (BGIR) covering an area of 167 acres, was set up in 2002 to encourage ex-situ conservation and breeding of rare, threatened, endemic, indigenous, medicinal and economic plants found across the country (Dogra et al., 2020). The Botanic Garden is home to more than 900 plant species including herbs, shrubs, trees and climbers. Plant species found include *Santalum album*, *Hardwickia binate*, *Hildegardia populifolia*, *Manilkara hexandra*, *Anogeissus latifolia*, *Holoptelea integrifolia*, *Terminalia bellirica*, *Careya arborea*, *Planchonia andamanica* and *Firmiana simplex* (Babbar et al., 2022). Some of the medicinal plants found in the garden are *Abrus precatorius*, *Centella asiatica*, *Cheilocostus speciosus*, *Chlorophytum borivilianum*, *Cinnamomum camphora*, *Clerodendrum indicum*, *Lawsonia inermis*, *Litsea glutinosa*, *Mentha spicata* and *Ocimum gratissimum*.

Amity University Campus in the city of Noida hosts species like *Ficus benjamina*, *Alstonia scholaris*, *Plumeria obtusa*, *Delonix regia*, *Ficus macrocarpa*, *Chukrasia tabularis*, *Phoenix dactylifera*, *Roystonea regia*, *Callistemon viminalis*, *Mimusops elengi*, *Cassia fistula*, *Azadirachta indica*, *Phyllanthus emblica*, *Ficus virens*, *Ficus religiosa*, *Morus alba* and *Peltophorum pterocarpum* (Sharma et al., 2020).

There are a total of 192 plant species found in Okhla Bird Sanctuary. Species found in the sanctuary include *Lemna perpusilla*, *Spirodela polyrrhiza*, *Phoenix sylvestris*, *Commelina benghalensis*, *Eichhornia crassipes*, *Typhus angustifolia*, *Carex alopecuroides*, *Cyperus iria*, *Eleocharis palustris* and *Fimbristylis cymosa* (Manral et al., 2013).

Out of the total 220 algal taxa present in the entire stretch of river Yamuna, Xanthophyceae and Dinophyceae are prominent in the Noida stretch of the river (Indian Institutes of Technology, 2012). Two species of Euglenophyceae is also found in this stretch.

3.3. Fauna

Okhla Bird Sanctuary is a haven for birds. According to Upadhyay et al. (2019), there are about 302 bird species, of which 131 are local, 121 are aquatic and 50 are migratory (Upadhyay et al., 2019). eBird (2023), a citizen science platform records 340 species.²

The campus of Amity University, Noida is home to about 46 species of lepidopterans (Amity University, n.d.). Some of them include *Vanessa cardui* (Painted Lady), *Chilades pandava* (Oriental Plains Cupid), *Amyna punctum* (Amyna Moth) and *Condica illecta* (Groundling Moth). The zooplankton community in the Noida stretch of river Yamuna is represented by 18 order and 196 taxa (Indian Institutes of Technology, 2012). Zooplankton including the Rotifer population of *Philodinida*, *Ploima* and *Eurotatoria* are also predominant in this river patch. In addition, a total of 49 species belonging to 33 genus and 19 families of fishes are present in the Noida stretch of river Yamuna. *Catla catla* and *Labeo rohita* are the two dominant species of fishes found in this stretch (Joshi et al., 2016).

A waterbody in Botanic Garden of Indian Republic, was developed to conserve aquatic biodiversity including endemic and threatened plants of different habitats under ex-situ conservation (Kumar, 2021). Some of the fish species present include *Labeo catla* (Catla), *Labeo rohita* (Rohu) and *Channa punctata* (Garai). Birds visiting the water body include *Ardea alba* (Great white Heron) and *Ardeola grayii* (Pond Heron).

A study by Bais and Bais (2021), recorded the presence of a little-known wasp, *Pison punctifrons* in Noida, which is rarely sighted in India.

3.4. Agrodiversity

The region surrounding the city of Noida where a wide variety of crops are cultivated. Farmers diligently cultivate a diverse range of vegetables, including tomatoes, potatoes, cauliflower, cabbage, bell peppers, and leafy greens (Ansari, 2015). Fruits such as mangoes, bananas, papayas, guavas, and citrus fruits thrive in Noida's favourable climate. An array of crops, including wheat, rice, maize, pulses, and oilseeds, flowers such as

2. eBird (2023). Checklist of Birds from Okhla Bird Sanctuary. Accessed from <https://ebird.org/india/hotspot/L2362886> on 21 February 2023

marigolds, roses, jasmine, and orchids, are also part of the agricultural produce.

The city of Noida's dairy and milk industry play a significant role in its agricultural landscape, with numerous dairy farms and milk processing units catering to the local demand. These establishments contribute to the production of high-quality milk, ensuring a steady supply of dairy products to the city's residents. Livestock rearing is another vital component of Noida's agrodiversity, with farmers raising various animals for meat, milk, and other by-products. Cattle, buffalo, goats, and poultry are commonly reared in the region, providing a source of livelihood for many farmers and fulfilling the demand for fresh meat and poultry products.



4. Obligations and Responsibilities

There is an extensive set of International, National and State policies and treaties that exist and will affect the implementation of the LBSAP of Noida. This section provides an overview of the relevant national and state level policies and guidelines. Before outlining these policies and guidelines, a brief description of the biodiversity governance model in India, suggested by (Krishnan et al., 2012). is provided.

4.1. Biodiversity Governance Models in India

There are broadly five types of biodiversity governance models that aid in conservation, sustainable use, and fair and equitable sharing of biological resources across different landscapes in India (Krishnan et al., 2012). Of the five models, two – territorial forests and protected areas – fall under the protected area type of biodiversity governance models. The other three – autonomous community efforts, co-management of forests and decentralized governance of biodiversity – are considered more closely under community-based conservation.

1. **Territorial forests:** Nearly a fifth of India's geographical area is classified as forest land. Territorial forests are classified into two main categories – reserved and protected forests – that mainly differ in the extent of rights and privileges accorded to the local people. The management of territorial forests is presently based on the principles of sustainable forest management (SFM) through working plans, emphasizing conservation and meeting subsistence needs of local communities as per the National Forest Policy issued in 1988.
2. **Protected areas:** Protected areas cover around 4.9 percent of the country's geographical area. With the enactment of the Wildlife (Protection) Act, 1972 and the launch of Project Tiger in 1973 this network began to gain more ground and post the 1980s after the biogeographic classification for the country was developed, many more protected areas, including coastal and marine protected areas, were established. Since the 1990s, there have been attempts to introduce a participatory approach in the management of protected areas as seen from the 'Community Reserves' and 'Conservation Reserves' established.
3. **Autonomous community efforts:** Autonomous Community Efforts (ACE) are initiated by communities for conservation and management of biological resources. ACEs in India can be broadly classified into two categories – 1) Community Conserved Areas (CCAs) and 2) Sacred Groves (SGs). In many areas of the North Eastern states, Autonomous District Councils (ADCs) play a central role in the management of natural resources.
4. **Co-management of forests:** Co-management of state-owned natural resources such as Joint Forest Management (JFM) involves the State Forest Department entering into an agreement with the local community, which is allowed greater access to the forest resources as well as a share in revenue, in return for protection of the forests against unauthorized extraction, encroachment and damage. There are presently over 118,000 Joint Forest Management Committees (JFMCs) that protect/manage around 23 million hectares of forest lands.
5. **Decentralized governance of biodiversity:** The Panchayati Raj Institutions (PRI) which govern rural areas have a three-tier structure with Gram Sabha and Gram Panchayat as the basic unit, which are usually at the level of a village. The Constitution (73rd Amendment) Act, 1992 has included minor forest produce, social forestry, farm forestry and fisheries as subjects devolved to the PRIs. The PRIs play an important role in the implementation of the Biological Diversity Act, 2002. Presently, 244,727 Biodiversity Management Committees (BMCs) are functioning across 28 states. Local self-government institutions have a particularly significant role in the implementation of several laws that are important from a biodiversity conservation perspective, most notably the Panchayats (Extension to the Scheduled Areas) Act, 1996 and the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

From the description of different types of biodiversity governance models, it is evident that "forest" is the primary focus of biodiversity conservation in India. Though the decentralized governance model has the option to include biodiversity outside the forest regime, it is not clearly mentioned. However, biodiversity outside forests, particularly urban biodiversity has got much attention in India in the past. The National Biodiversity Strategy and Action Plan prepared by Kalpvriksh in 2003 has a sub thematic plan on urban biodiversity. It discusses various aspects of urban biodiversity and city planning strategies around urban biodiversity (Rane, 2003).

4.2. National Level Policies, Guidelines and Legislation

4.2.1. Environment and biodiversity policy frameworks

India has developed a robust legislative and policy framework for biodiversity governance which includes protection, conservation as well as sustainable use, access and benefit sharing. Protection of the environment, including biodiversity, is enshrined in the Constitution of India. It instructs both the Government and citizens to take appropriate steps in this direction. The policy framework for biodiversity governance comprises a number of sector-specific and cross-sectoral policy statements issued over the years. Some of the key policy statements include (i) National Forest Policy, 1988 which is redrafted in 2018 ; (ii) National Conservation Strategy and Policy Statement on Environment and Development, 1992; (iii) National Agriculture Policy, 2000; (iv) National Seeds Policy, 2002; (v) National Environment Policy, 2006; (vi) National Water Policy, 2012; and (vii) National Marine Fishing Policy, 2017. Agricultural, fishery and water related policies are detailed in the subsequent section (Refer Table 2).

4.3. Key Legislations

4.3.1. Environmental and biodiversity laws

India has well defined laws and policies on environment and biodiversity (wild). Environmental protection is represented within the Constitution of India in Article 48A (Protection and improvement of environment and safeguarding of forests and wildlife) and Article 51(A) (g) 3 (to protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures). Important laws relating to the environment, forests and biodiversity include The Indian Forest Act, 1927; The Forest (Conservation) Act, 1980; The Joint Forest Management (JFM) Circular, 1990; The Wildlife (Protection) Act, 1972; The Environment (Protection) Act, 1986; The Water (Prevention and Control of Pollution) Act, 1974; The Air (Prevention and Control of Pollution) Act, 1981, Biological Diversity Act, 2002 (Singh and Singh, 2016). Some major initiatives taken in the country to improve implementation mechanisms are Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights Act, 2006); setting up of the Wildlife Crime Control Bureau; Green India Mission; Mahatma Gandhi National Rural Employment Guarantee Act; and setting up the National Fisheries Development Board, 2006. Biodiversity has been mainstreamed in the agricultural sector through the following legal instruments Bio-safety Regulatory Framework in India; The Seeds Act, 1966 as amended up to 1972; The Insecticides Act, 1968, as amended up to 2000; The Protection of Plant Varieties and Farmers' Rights Act, 2001 (Ministry of Environment and Forests, 2002). Relevant national, sub-national and local legislations / policies and strategies are summarized in Table 2.

Table 2: Relevant National and subnational level legislations / policies / strategies

Legislation / Policy / Strategy	How it relates to Biodiversity
National	
National Forest Policy, 1988	Protection, conservation and development of forests giving weight to the protective role of forests in maintaining ecological balance and environmental stability
National Draft Forest Policy, 2018	"Shifts the approach towards forestry in India – specifically, from a local community- and ecology-centric approach emphasised in the 1988 policy to focusing on timber and forest-based industries" (S. Agarwal, 2018). Other focuses are on economic valuation of ecosystem services, forest certification, national forest ecosystem management information system and incorporation of climate change concerns in all forest and wildlife areas working/management plans and Community Ecosystem Management Plans.
National Conservation Strategy and Policy Statement on Environment and Development, 1992	Views development policies from environmental perspectives and the support policies and systems required

3. The draft is not yet finalized. For the approved version of the draft policy, please visit this [link](#)

Legislation / Policy / Strategy	How it relates to Biodiversity
National Agriculture Policy, 2000	Promote technically sound, economically viable, environmentally non-degrading, and socially acceptable use of natural resources for the sustainable development of agriculture
National Seeds Policy, 2002	Protect the interest of farmers and encourage conservation of agro-biodiversity.
National Environment Policy, 2006	Dominant theme is the sustainable use of natural resources
National Biodiversity Action Plan (2008) and Addendum (2014)	Actions that can be taken to protect and enhance biodiversity
National Water Policy, 2012	Integrated perspective in the planning and management of water resources, issues such as adapting to climate change, conservation of river corridors etc. are dealt with
Draft National Inland Fisheries and Aquaculture Policy, 2019	The draft policy intends to ensure ecologically healthy, economically viable and socially inclusive inland fisheries and aquaculture that generates gainful employment and economic prosperity. The emphasis of the policy framework is on intensive aquaculture fisheries and comprehensive state control of inland fisheries.
Draft National Mariculture Policy, 2019	Intends to ensure sustainable farmed seafood production for the benefit of food and nutritional security of the Nation and to provide additional livelihood and entrepreneurial opportunities to the coastal communities for better living.
Draft National Fisheries Policy, 2020	The policy aims to accelerate the development of the fisheries sector by focusing on increasing investments, infrastructure and doubling of exports. The overall intent is to secure the overall development of capture fisheries and aquaculture in the country. While the policy states that it is focussed on the economic prosperity of fishers and fish farmers' especially traditional and small-scale fisheries, fishermen bodies, issues raised by these stakeholders state that it is neither protecting the interest of the fishing communities nor the environment.
Article 48A in the Constitution of India	Protection and improvement of environment and safeguarding of forests and wildlife
Article 51(A)(g) in the Constitution of India	Protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures
The Indian Forest Act, 1927 The Indian Forest (Amendment) Bill, 2019	Consolidates the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest-produce. The 2019 amendment focuses on re-establishing state power over forests at the cost of rights granted to the forest dwelling tribals and other forest dwellers under the Forest Rights Act of 2006 (FRA).
The Forest (Conservation) Act, 1980 The Forest (Conservation) Amendment bill, 2023	The 1980 act was adopted to protect and conserve forests. The proposed Bill in 2024 introduces amendments that seeks to restrict the conservation scope of the 1980 Act to only certain forest lands. It also exempts border lands from the obligation to seek permissions to clear forests in order to construct "strategic linear projects of national importance". Finally, it also allows some non-forest activities on forest lands, like running zoos and 'eco-tourism' facilities. The Bill in essence removes the checks and balances the 1980 Act includes, in the form of forest clearance permissions and the informed consent of the local community.
The Joint Forest Management (JFM) Circular, 1990	Shifted the emphasis of the forest sector towards preservation and regeneration through co-management of forests in which villagers cooperate with the State to protect forests in exchange for a share in the usufruct and final harvest.

Legislation / Policy / Strategy	How it relates to Biodiversity
The Wildlife (Protection) Act, 1972 The Wildlife (Protection) Amendment Act, 1991 The Wildlife (Protection) Amendment Act, 2002 The Wildlife (Protection) Amendment Act, 2006 The Wildlife (Protection) Amendment Bill, 2022	<p>Protection to listed species of flora and fauna and establishes a network of ecologically-important protected areas. The act has played a critical role in conserving the country's diverse wildlife. The 1991 amendment strengthened the penalties and fines for wildlife-related offences and also introduced provisions for the protection of endangered species. The 2002 amendment introduced the concept of community reserves and conservation reserves as parts of the protected area network. The 2006 amendment addressed the issue of human-wildlife conflict and provided for the creation of the National Tiger Conservation Authority.</p> <p>The main reason for introducing the 2022 Bill, was the need to provide legislative backing to commitments made by India over the past many years to the CITES. However, the amendments have several impacts on conservation where it confers protection on numerous species without any scientific backing resulting in a lack of priority on what species to allocate limited resources to. It impacts people by enforcing a coexistence factor, failing to consider human-wildlife conflict and local livelihoods. It also impacts scientific research by making it difficult to obtain permits for research and collection of samples.</p>
The Environment (Protection) Act, 1986	Empowers the national government to take measures necessary to protect and improve the quality of the environment by setting standards for emissions and discharges; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare
The Water (Prevention and Control of Pollution) Act, 1974 The Water (Prevention and Control of Pollution Amendment) Act, 1988	Represents India's first attempts to comprehensively deal with environmental issues. Conforms closely with the EPA, 1986 above. This was amended in 1988 to allow citizens to take actions under the Water Act. Also provided for more stringent penalties under Sec. 41.
The Water (Prevention and Control of Pollution) Cess Act, 1977 The Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003	Provides for the levy and collection of a cess on water consumed by persons operating and carrying on certain types of industrial activities. This cess is collected with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974. The Act was last amended in 2003.
The Air (Prevention and Control of Pollution) Act, 1981 The Air (Prevention and Control of Pollution Amendment) Act, 1987	Means for the control and abatement of air pollution. The amendment in 1987 brought into the act's purview, noise, as an air pollutant.
Biological Diversity Act (2002) Biological Diversity (Amendment) Act, 2023	Conservation of biological resources and associated knowledge as well as facilitating access to them in a sustainable manner and through a just process. The 2023 bill advocates for the utilization of indigenous medicinal practices, streamlines the process of patent applications for research, and encourages the cultivation of wild medicinal plants. The amendments seek to exempt registered AYUSH medical practitioners from intimating biodiversity boards before accessing biological resources, ease compliance burdens, boost investment and simplifying patent application processes. The benefit sharing aspect is also no longer clearly defined in this amendment.
Wetlands (Conservation and Management) Rules, 2010 Wetlands (Conservation and Management) Rules 2017	Better conservation and management and to prevent degradation of existing wetlands in India. The 2017 amendment moved the management of wetlands away from a central body and toward state-level organisations. It also removed protection from backwaters, lagoons, creeks, and estuaries.
Green India Mission, 2014	Afforestation of six million hectares of degraded forest lands and expanding forest cover from 23 to 33 percent of India's territory.

Legislation / Policy / Strategy	How it relates to Biodiversity
National Mission for Sustainable Agriculture, 2014	Climate adaptation in agriculture. The main goal is to increase agricultural productivity, particularly in rainfed regions, by emphasizing integrated farming, efficient water use, managing soil health, and coordinating resource conservation.
National Solar Mission, 2010	Aimed at harnessing the abundant solar energy potential of the country. Seeks to promote the rapid adoption and deployment of solar power as a sustainable and clean energy source.
National Mission for Enhanced Energy Efficiency, 2011	Seeks to reduce energy consumption, enhance energy efficiency measures and promote the use of renewable energy sources to achieve sustainable development goals.
National Mission on Sustainable Habitat, 2010	Addresses the challenges posed by rapid urbanization and ensure the development of sustainable and environment friendly habitats across the country.
National Water Mission, 2011	Addresses the challenges posed by water scarcity, pollution and climate change in the country. Aims to enhance water security through the development of infrastructure for rainwater harvesting, groundwater recharge and wastewater treatment.
Long Term Low Carbon Development Strategy, 2022	Formulate and communicate long-term low greenhouse gas emission development strategies by creating low-carbon development pathway focusing on net-zero production by 2070.
Agriculture Infrastructure Fund Scheme, 2020	The scheme was proposed to address issues like agri-infrastructure facilities, wasteland development, minor irrigation and provide all around financial support to the farmers, agri-entrepreneurs and farmer groups.
National Mission on Strategic Knowledge for Climate Change, 2010	Aims to enhance the understanding of climate dynamics, impacts and vulnerability while also promoting the development and deployment of innovative solutions.
Amrit Dharohar, 2023	Aims to protect and optimize use of wetlands in India by increasing biodiversity and carbon stock in wetlands, promoting ecotourism opportunities and income generation for local communities
Mission Sahbhagita, 2022	Adopts a society ownership approach with communities leading wetland conservation.
Nagar Van/Vatika Yojana (NVY), 2020	A modified version of the Nagar Van Udyan Scheme launched in 2015, this scheme recognises the value of urban forests in an urban landscape. It aims at developing 400 Nagar Vans and 200 Nagar Vatikas with the objective to significantly enhance the tree outside forests and improve green cover in cities.
Sub-National	
Uttar Pradesh Forest Act, 1976	Provides for the conservation, management and development of forests and the protection of wildlife in Uttar Pradesh.
The Uttar Pradesh Air (Prevention and Control of Pollution) Rules, 1983	Provides a comprehensive framework for regulating various aspects of air pollution, including the establishment of air pollution control areas, identification of pollution sources, emission standards for industries and vehicles and monitoring and enforcement of pollution control measures.
Uttar Pradesh Protection of Trees on Private Lands Act, 1976	Aims to prevent the indiscriminate felling of trees and encourages their conservation for the overall benefit of the environment.
Uttar Pradesh Poultry Development Policy 2022	Promotes establishment of commercial layer farm and broiler parent farm at subsidised interest rates. Dedicated portal and database management and project facilitation centre for monitoring.
Uttar Pradesh Ground Water (Management and Regulation) Act, 2019	Focuses on the management and regulation of groundwater resources in Uttar Pradesh. It seeks to control and prevent overexploitation of groundwater and promote sustainable water management practices.

Legislation / Policy / Strategy	How it relates to Biodiversity
Uttar Pradesh Solar Energy Policy, 2022	Promotes the development and utilization of solar energy in Uttar Pradesh. It outlines incentives, subsidies and provisions for the installation and operation of solar power projects.
Uttar Pradesh Water Supply and Sewerage Act, 1975	Provides for the establishment of a corporation, authorities and organisations for the development and regulation of water supply and sewerage services.
Uttar Pradesh Agricultural Credit Act, 1973	To make provisions to facilitate adequate flow of credit for agricultural production and development through banks.
Uttar Pradesh Village Forests Joint Management Rules, 1997	Encourages the active participation of local communities in the decision-making processes regarding the protection, utilization, and regeneration of village forests.
Uttar Pradesh Forest Policy, 2017	Recognizes the crucial role of forests in maintaining ecological balance, conserving biodiversity and providing livelihood opportunities to local communities.
Uttar Pradesh State Biological Diversity Rules, 2010	Contribute to the protection of biodiversity and the preservation of traditional knowledge, while promoting sustainable development and the well-being of local communities in the state.
Uttar Pradesh Groundwater (Management and Regulation) Rules, 2020	Aim to promote sustainable management and efficient use of groundwater resources while safeguarding the interests of the local communities dependent on it.
Uttar Pradesh Agriculture Export Policy, 2019	Aims to boost agricultural productivity, enhance value addition and provide a competitive edge to Uttar Pradesh's agricultural sector in the global market.
Uttar Pradesh Dairy Development Policy, 2022	Establishment of cattle feed and cattle nutritional products and units for value added products of milk like cheese, ice cream by creating MSME units.
Local	
Environment and Quality Policy	The city of Noida continually aims to improve its environmental and quality performances through monitoring of environmental targets.
Uttar Pradesh Industrial Area Development Act, 1976	Provides for the constitution of an Authority for the development of certain areas in the State into industrial and urban township. Encourages environmental upkeep of the place.

4.4. Institutional Environment in Noida

Environment, Forest and Climate Change Department: This State department headed by the Principal Secretary is responsible for conservation of forests and biodiversity, carrying out large scale plantation for increasing the green cover and implementing sustainable harvesting of goods and services from biological resources. For more information, please visit: <http://upforest.gov.in/web/forestnew/default.aspx>

Uttar Pradesh State Biodiversity Board: The State Biodiversity Board is formed with the purpose of implementing the aims and missions as prescribed in Biological Diversity Act, 2002 including regulation of access to biological resources of the country with the purpose of securing equitable share in benefits, conservation and sustainable use of biodiversity, to safeguard traditional knowledge and information relating to the use of biological resources and protection of endangered and threatened species. For more information, please visit: <https://upsbdb.org/>

New Okhla Industrial Development Authority: The authority was established under the U.P. Industrial Area Development Act, 1976. Since its inception, it is responsible for the development of the city, urban planning and architecture. For more information, please visit: <https://noidaauthorityonline.in/>

4.5. Status of the NBSAP and SBSAP

4.5.1. NBSAP

In 1999, India released its National Policy and Macro Level Action Strategy on Biodiversity, in response to becoming a Party to the Convention on Biological Diversity (Ministry of Environment and Forests, 1999). This document was meant to provide the framework for preparing detailed action programmes at the micro level for conservation and sustainable use of biodiversity in the country. Between 2000 and 2003, as part of an externally funded Global Environment Facility (GEF) project, the Ministry of Environment and Forests (MoEF) initiated the development of the National Biodiversity Strategy and Action Plan (NBSAP) (TPCG & Kalpavriksh, 2005). The exercise was considered one of the largest participatory exercises in the country under which 33 state level, 10 eco-region level, 18 local level and 13 thematic action plans were prepared. The NBSAP was released as a final technical report in 2004. During this time the Biological Diversity Act was enacted in 2002 (Ministry of Environment and Forests, 2002) and the rules notified in 2004. In 2006, India adopted its National Environment Policy, as a result of which in 2008, the National Biodiversity Action Plan (NBAP) was developed (Ministry of Environment and Forests, 2008). As the NBAP of 2008 was drafted prior to the CBD Strategic Plan for Biodiversity 2011-2020, it was updated in 2014 with an addendum (Ministry of Environment Forest and Climate Change, 2014). The NBAP Addendum primarily comprises of 12 National Biodiversity Targets (NBTs) which link with the Aichi Biodiversity Targets. The NBTs were also crafted to crosslink with the 175 actions of the NBAP 2008 allowing for monitoring and reporting at a national level and contributing at an international level to Aichi targets. More information on India's NBTs and NBAP can be found in Annexure 8.1.

While the NBAP provides good overview of the state of biodiversity and the issues at hand, it reads more like a broad strategy paper and lacks decisive and well formulated action plans to address the issues. The plans for sustainable use and benefit sharing are missing and the new developments as a result of the Forest Rights Act, 2006 are not incorporated (Faizi, 2013). In order to impede the monitoring of the NBTs, timelines within the plans are flexible and objectives of the plan can only be enforced through schemes and programs of the relevant ministries. So far in India, mainstreaming of biodiversity has achieved some success in the forestry sector which is directly under the control of the MoEFCC, however in sectors such as agriculture, and water resources it is proving to be more challenging (CBD, 2013).

With the 10th Conference of Parties calling for the development of second generation NBSAPs, India needs set the focus of its strategy on the implementation mechanism, measurable targets and the incorporation of the biodiversity-poverty reduction linkage. Mainstreaming of biodiversity can be improved by focusing on improving sectoral ownership at the central and state level and increasing vertical cooperation. Furthermore, by reaching out to NGOs and the civil society to contribute to the process, enhanced implementation of the NBTs and a more comprehensive NBSAP will be possible (CBD, 2016).

The Kunming-Montreal Global Biodiversity Framework, adopted at the 15th Conference of Parties to the UN Convention on Biological Diversity in December 2022 (CBD, 2022) calls for countries to revise their NBSAPs in close alignment to its goals and targets. The framework aims to ensure the utility of NBSAPs in the enhanced implementation, monitoring, reporting and review mechanism towards addressing each of its goals and targets, which include, halting biodiversity loss, restoring ecosystems and increasing the benefits that people derive from nature. Since, the Framework further recognises NBSAPs as the main instrument for implementation of the Convention on Biological Diversity at the national level, it emphasises its role in involving governments and stakeholders at all levels, including indigenous people and local communities, women and youth across society, to ensure that actions and expected outcomes are well-coordinated. Most importantly, the framework stresses that the NBSAP process should gather high-level political support, ensure interministerial coordination and facilitate implementation. India is currently in the process of updating its National Biodiversity Targets (Table 3) to align with the new framework.

Table 3: National Biodiversity Targets upto 2020

	TARGET 1: By 2020 a significant proportion of the country's population, especially the youth, is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
	TARGET 2: By 2020 values of biodiversity are integrated in national and state planning processes, development programmes and poverty alleviation strategies.
	TARGET 3: Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are finalised and actions put in place by 2020 for environmental amelioration and human well-being.
	TARGET 4: By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritised invasive alien species are managed.
	TARGET 5: By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries.
	TARGET 6: Ecologically representative areas under terrestrial and inland water, and coastal and marine zones, especially those of particular importance for species, biodiversity and ecosystem services and conserved effectively and equitably, based on protected area designation and management and other area-based conservation measures are integrated into the wider landscapes and seascapes, covering over 20 % of the geographic area of the country by 2020.
	TARGET 7: By 2020, genetic diversity of cultivated plants, farm livestock and their wild relatives, including other socio-economically as well as culturally valuable species, is maintained and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.
	TARGET 8: By 2020, ecosystem services, especially those relating to water, human health, livelihoods and well-being are enumerated and measures to safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections.
	TARGET 9: By 2015, Access to Genetic Resources and the Fair and Equitable Sharing of benefits arising from their utilization as per the Nagoya protocol are operational, consistent with national legislations.
	TARGET 10: By 2020, an effective, participatory and updated national biodiversity action plan is made operational at different levels of governance.
	TARGET 11: By 2020, national initiatives using communities' knowledge relating to biodiversity are strengthened, with the view to protecting this knowledge in accordance with national legislations and international obligations.
	TARGET 12: By 2020, opportunities to increase the availability of financial, human and technical resources to facilitate effective implementation of the Strategic Plan for Biodiversity 2011-2020 and the national targets are identified and the strategy for resource mobilization is adopted.

(Source: Ministry of Environment, Forest and Climate Change, 2014)

At the CBD COP15 held in Montreal Canada in December 2022, the Kunming-Montreal Global Biodiversity Framework (GBF) was adopted by 188 governments including India. The GBF consists of four global goals and 23 targets to protect nature and halt extinction by 2030 (SCBD, 2022). India will need to revise its NBTs to align with the new framework, the agreed upon goals and the targets within the new 2030 timeframe.

4.5.2. SBSAP

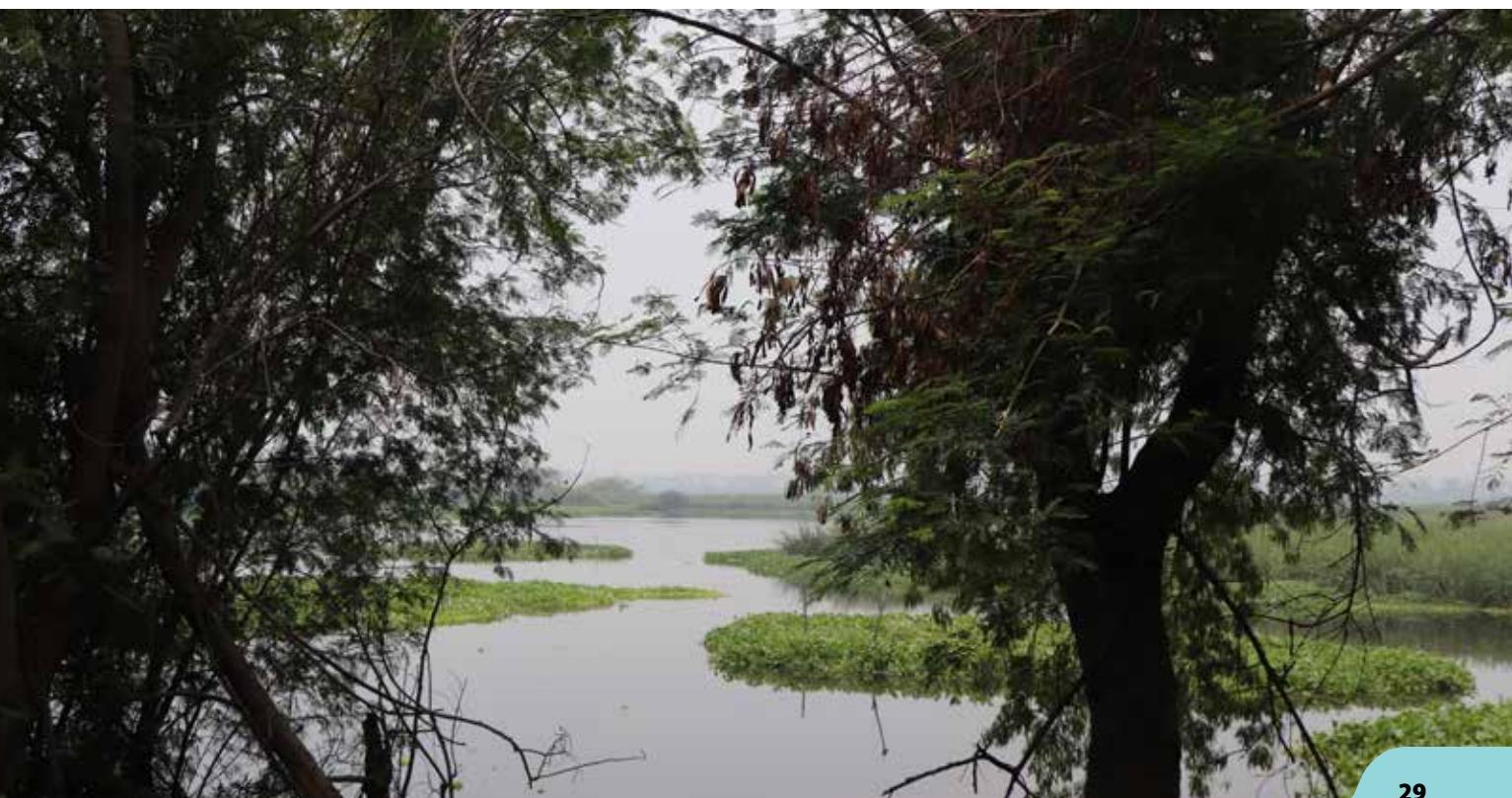
The Uttar Pradesh State Biodiversity Strategy and Action Plan (2021-2030) (Badola et al., 2022) is an ambitious plan that recognizes the critical need to address the various challenges faced by Uttar Pradesh in terms of biodiversity conservation and sustainable development. The action plan aims to safeguard the state's rich biodiversity, which encompasses diverse ecosystems, flora, and fauna, by implementing a range of targeted actions over the next decade.

The plan encompasses a multifaceted approach that includes enhancing awareness and understanding of biodiversity among various stakeholders, including local communities, policymakers, and the general public. It emphasizes the importance of integrating traditional knowledge and practices into biodiversity conservation efforts, recognizing the valuable insights that indigenous communities possess. The plan also emphasizes the significance of scientific research, data collection, and monitoring to inform evidence-based decision-making and effective management strategies.

One of the key aspects of the action plan is the promotion of sustainable development practices that harmonize economic growth with environmental protection. It recognizes the importance of mainstreaming biodiversity considerations into key sectors such as agriculture, forestry, fisheries, tourism, and urban planning. By incorporating biodiversity considerations into these sectors, the plan aims to minimize negative impacts on ecosystems while ensuring the sustainable use of natural resources.

The strategy plan also highlights the need to strengthen the management of protected areas and forests, as they play a crucial role in preserving biodiversity hotspots and providing habitats for numerous plant and animal species. It focuses on enhancing the capacity of protected area managers, improving infrastructure, and implementing effective conservation measures.

The collaboration between the Uttar Pradesh State Biodiversity Board and the Wildlife Institute of India has ensured that the strategy is based on the latest scientific knowledge and expertise. The plan also acknowledges the importance of partnerships and collaborations with various stakeholders, including government agencies, NGOs, research institutions, and local communities. It encourages the active involvement of these stakeholders in the implementation of the action plan, fostering a sense of ownership and responsibility for biodiversity conservation.



5. Local Biodiversity Strategy And Action Plan for Noida

This section encompasses the overarching vision, guiding principles and goals as well as detailed action plan for achieving each goal.

The overarching strategy for a LBSAP (Figure 4) consists of a 'Vision' and clearly defined 'Focus Areas'. The Vision is a short descriptive statement of the desired future state of biodiversity within the local municipality. The Vision is intended to provide direction to the plan as well as provide inspiration and motivation. It ideally articulates an optimal future scenario to strive towards and should be both concise and ambitious yet realistic and achievable. A compelling vision can provide a powerful means to galvanize city-wide cross-sectoral support for an LBSAP objectives to achieve the vision.

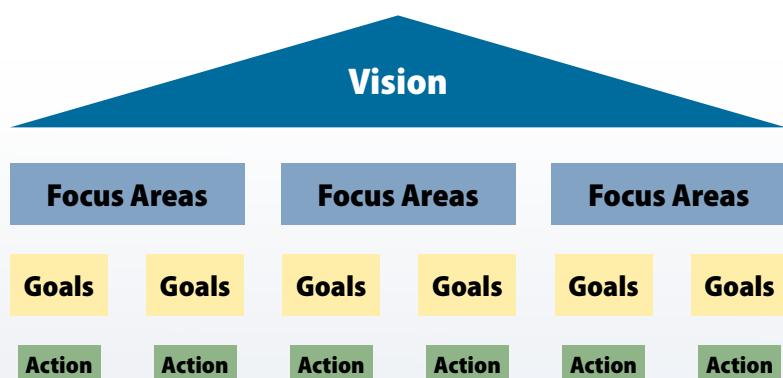


Figure 4: Key elements of a Strategy and Action Plan

5.1. Vision

The city of Noida has developed the following vision for the LBSAP

Vision of Noida for LBSAP

"Noida envisions a future where ecological conservation is seamlessly integrated with economic growth, creating an inclusive, sustainable and resilient city that fosters prosperity for all its inhabitants, prioritising holistic protection and restoration of ecosystems."

5.2. Guiding Principles

The guiding principles for achieving the vision are:

1. The existing natural ecological spaces should be maintained in their natural condition, remain intact and function optimally. These are valuable spaces that provide ecological goods and services to the city.
2. Biodiversity conservation activities should be aligned with existing plans and initiatives being undertaken by the city.
3. The city management should adopt innovative approaches for protecting and integrating biodiversity conservation into city planning.
4. Local communities should be engaged for the conservation and management of the remaining natural resources, which will help to harness existing local and traditional knowledge as well as raise awareness on biodiversity issues.

5.3. Focus Areas

LBSAP Focus Areas are intended to be planned, deliberated and focused efforts that are required to achieve the Vision. Most importantly, the Focus Areas established should reflect the priorities of the stakeholders, within the context of the established vision to help to create a common sense of purpose. The 7 key Focus Areas for the LBSAP of Noida are outlined in Table 4. Unlike some other LBSAPs from cities across the world, this LBSAP used important ecosystems as Focus Areas instead of developing new defined areas for action. These ecosystems are the ones which are reported to be under serious threat of biodiversity loss due to various developmental and anthropogenic activities in the city. The goals and action plans were developed based on these threats, identified in consultation with various stakeholders in the city.



Table 4: Noida LBSAP Focus Areas

Sl. No.	Focus Areas
1	Avenue Trees
2	Rivers and their Flood Plains
3	Parks and Gardens
4	Agriculture
5	Ponds
6	Okhla Bird Sanctuary
7	Urban Forests

5.4. Biodiversity Goals

LBSAP Goals refer to well defined targeted statements that give clarity, direction and focus to the LBSAP. These goals constitute the core LBSAP and are closely aligned with the National Biodiversity Action Plan, and ultimately the Aichi Biodiversity Targets. The 15 goals for the Noida LBSAP which fall under 7 Focus Areas, along with guiding notes to provide further context for the selected goals, are outlined below. The time frame set for achieving the goals in this LBSAP is five years, that is by the year 2029. This LBSAP should be revised after 2029.

Biodiversity Goals

Focus Area 1: Avenue Trees	<p>Goal 1.1: Maintenance and protection of the existing avenue trees</p> <p>Guiding Notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Geotagging of all avenue trees in the city and preparation of lane specific registers of avenue trees 2. Development and maintenance of annual health cards for all avenue trees for regular monitoring of each tree 3. Involvement of citizens and NGOs through citizen science platforms or adopt a tree scheme
	<p>Goal 1.2: Developing a compendium of avenue trees and ecosystem services provided by them</p> <p>Guiding Notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Development of GIS based map of existing avenue trees 2. Development of species inventory of existing avenue trees 3. Analysis of ecosystem services provided by avenue trees
	<p>Goal 1.3: Increasing the avenue tree cover in the city and developing policy support for the same</p> <p>Guiding Notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Undertaking scientifically informed plantations and maintenance of the same 2. Establishment of city level nurseries of native trees 3. Development of a city specific policy on urban greening 4. City ratification of the above policy
Focus Area 2: Rivers and their Flood Plains	<p>Goal 2.1: Improving management of the rivers and flood plains</p> <p>Guiding Notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Development of geo-referenced map of the rivers, their streams and catchment areas 2. Assessment of ecosystem services provided by the rivers and the flood plains 3. Assessment and delination of geo-hydrological aquifers 4. Development of an action plan for effective management of rivers and flood plains 5. City ratification of the above action plan

Biodiversity Goals	
	<p>Goal 2.2: Restoration of rivers and flood plains</p> <p>Guiding Notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Desilting, dewatering and use of Nature based Solutions for river restoration 2. Prevention of sewage discharge into the rivers and their associated canals, through the establishment of decentralised sewage treatment plants at various hotspots 3. Prevention of solid waste disposal in the rivers and their associated canals through household level segregated waste collection and establishment of decentralised organic waste treatment, supplemented with targeted awareness programmes 4. Prevention of discharge of industrial effluents into the rivers and their associated canals by establishment of waste water treatment facilities within the industries 5. Regulation and monitoring of construction activities on the flood plains 6. Assessment and control of invasive species in the rivers and along the flood plains 7. Assessment of the levels of degradation in the flood plains 8. Afforestation along the flood plains through use of native species
Focus Area 3: Parks and Gardens	<p>Goal 3.1: Improving health and biodiversity of parks and gardens</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Undertaking plantations of native species and maintenance of the same 2. Establishment of city level nurseries for saplings of native species 3. Development of a city specific policy on urban greening 4. City ratification of the above policy
	<p>Goal 3.2: Promoting investment in green space development and maintenance</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Development of green space management plan (including business cases for private sector investment) 2. Promoting private sector investment in development and maintenance of parks and gardens
Focus Area 4: Agriculture	<p>Goal 4.1: Mapping the existing extent of agriculture within the city limits and documenting the crops and practices</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 3. Development of a GIS based map of existing agricultural land in the city 4. Documentation of the crops sown, practices followed for cultivation and post-harvest processing 1. Analysis of the change in agricultural area over time, and periodic monitoring of the same

Biodiversity Goals

	<p>Goal 4.2: Promotion of agriculture through organic farming and other biodiversity friendly methods of cultivation</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Promoting home gardens, terrace gardens, kitchen gardens through revisions in existing building bye laws 2. Awareness generation on existing schemes and subsidies relevant to urban farming 3. Providing policy support for urban agriculture, including crop insurance, incentives 4. Awareness generation in schools, colleges and residential complexes on need and significance of urban agriculture and use of locally grown crops and vegetables
<p>Focus Area 5: Ponds</p>	<p>Goal 5.1: Mapping the existing pond network within the city and their health status</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Development of a GIS based map of the existing pond network 2. Identification of the health of each pond and the drivers of degradation and threats for each pond
<p>Focus Area 5: Ponds</p>	<p>Goal 5.2: Undertaking pond restoration through community participation</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Development and implementation of action plans for revival and restoration of ponds, with inputs from community members, traditional knowledge holders and subject matter experts 2. Plantation of native species around existing ponds and establishing waste free zones around the ponds 3. Awareness generation among citizens on significance of ponds, through techniques like community walks around ponds 4. Formation of neighbourhood-based pond associations in appropriate ward (s) for regular monitoring of pond health
<p>Focus Area 6: Okhla Bird Sanctuary</p>	<p>Goal 6.1: Documenting the present condition of Okhla Bird Sanctuary</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Assessing the health status of the Sanctuary and the threats to the same 2. Mapping the invasive species and their spread 3. Valuing the ecosystem services provided by the Sanctuary <p>Goal 6.2: Restoring and conserving Okhla Bird Sanctuary</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Developing and implementing an eco-restoration plan for the Sanctuary using Nature based Solutions 2. Awareness generation among students about the significance of the Sanctuary through mandatory visits to the Sanctuary 3. Training local youth as nature guides 4. Development of a state-of-the-art Nature Interpretation Centre and other tourist facilities for promoting eco-tourism

Biodiversity Goals	
Focus Area 7: Urban Forests	<p>Goal 7.1: Mapping the existing urban forests and their benefits</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Developing a GIS based map of the existing urban forests within the city limits 2. Documenting the biodiversity in the existing forests 3. Assessing the health of each urban forest and the drivers of degradation 4. Estimating the ecosystem services provided by each urban forest and economic value of the same
	<p>Goal 7.2: Promoting development of biodiversity friendly urban forests through ecological restoration</p> <p>Guiding notes: This goal aims at:</p> <ol style="list-style-type: none"> 1. Identification of degraded land parcels for development of urban forests 2. Development and implementation of site-specific plan for development of urban forest through the process of ecological restoration 3. Development of nurseries for saplings of native species 4. Promoting private sector investment in ecological restoration of degraded lands through development and maintenance of urban forests

5.5. Actions Supporting the Goals

The Actions included in this LBSAP directly link to the Biodiversity Goals outlined above. Actions defined herein factors in (1) what steps need to be taken to reach the goal and how to get there (2) who is responsible for the actions; (3) broad timeframe for the completion of each action; and (4) impact of the action.

Table 5: Actions linked with the biodiversity goals for Noida

Focus Areas and Goals	Key Actions	Key Stakeholders	Time Frame	Impact (Short / Medium / Long term)
Focus Area 1: Avenue Trees				
Goal 1.1: Maintenance and protection of the existing avenue trees	1. Geotagging of all avenue trees in the city and preparation of lane specific registers of avenue trees	NGOs, Noida Authority, State Biodiversity Board, Biodiversity Management Committee, Schools, Colleges, Universities, State Horticulture Department, Resident Welfare Associations	One Year	Long
	2. Development and maintenance of annual health cards for all avenue trees for regular monitoring of each tree	Noida Authority, Biodiversity Management Committee, Research Institutions	One Year	Long
	3. Involvement of citizens and NGOs through citizen science platforms or adopt a tree scheme	Noida Authority, State Biodiversity Board, Resident Welfare Associations, State Horticulture Department, Biodiversity Management Committee	One Year	Medium

Focus Areas and Goals	Key Actions	Key Stakeholders	Time Frame	Impact (Short / Medium / Long term)
Goal 1.2: Developing a compendium of avenue trees and ecosystem services provided by them	1. Development of GIS based map of existing avenue trees	NGOs, Noida Authority, Research Institutions, State Horticulture Department, Biodiversity Management Committee	Six Months	Short
	2. Development of species inventory of existing avenue trees	Research Institutions, NGOs, Subject Matter Experts, Noida Authority, Biodiversity Management Committee	One Year	Long
	3. Analysis of ecosystem services provided by avenue trees	Biodiversity Management Committee, Subject Matter Experts, Research Institutions, NGOs, Resident Welfare Associations	One Year	Long
Goal 1.3: Increasing the avenue tree cover in the city and developing policy support for the same	Undertaking scientifically informed plantations and maintenance of the same	Research Institutions, Subject Matter Experts, Biodiversity Management Committee, NGOs, Resident Welfare Associations, Schools and Colleges	One Year	Short
	Establishment of city level nurseries of native trees	Noida Authority, State Horticulture Department, Biodiversity Management Committee	One Year	Long
	Development of a city specific policy on urban greening	Noida Authority, State Horticulture Department, State Forest Department, Subject Matter Experts	One Year	Long
	City ratification of the above policy	Noida Authority, Biodiversity Management Committee	Six Months	Long

Focus Area 2: Rivers and their Flood Plains

Goal 2.1: Improving management of the rivers and flood plains	Development of geo-referenced map of the rivers, their streams and catchment areas	Noida Authority, Research Institutions, Subject Matter Experts, NGOs	Six Months	Short
	Assessment of ecosystem services provided by the rivers and the flood plains	Noida Authority, Research Institutions, Subject Matter Experts, NGOs, Biodiversity Management Committee	One Year	Medium
	Assessment and delination of geo-hydrological aquifers	Noida Authority, PWD, PHED, Research Institutions, Subject Matter Experts, Biodiversity Management Committee	One Year	Medium
	Development of an action plan for effective management of rivers and flood plains	Noida Authority, State Water Resources Department, Biodiversity Management Committee, NGOs, Research Institutions	Two Years	Long
	City ratification of the above action plan	Noida Authority, Biodiversity Management Committee	Six Months	Long

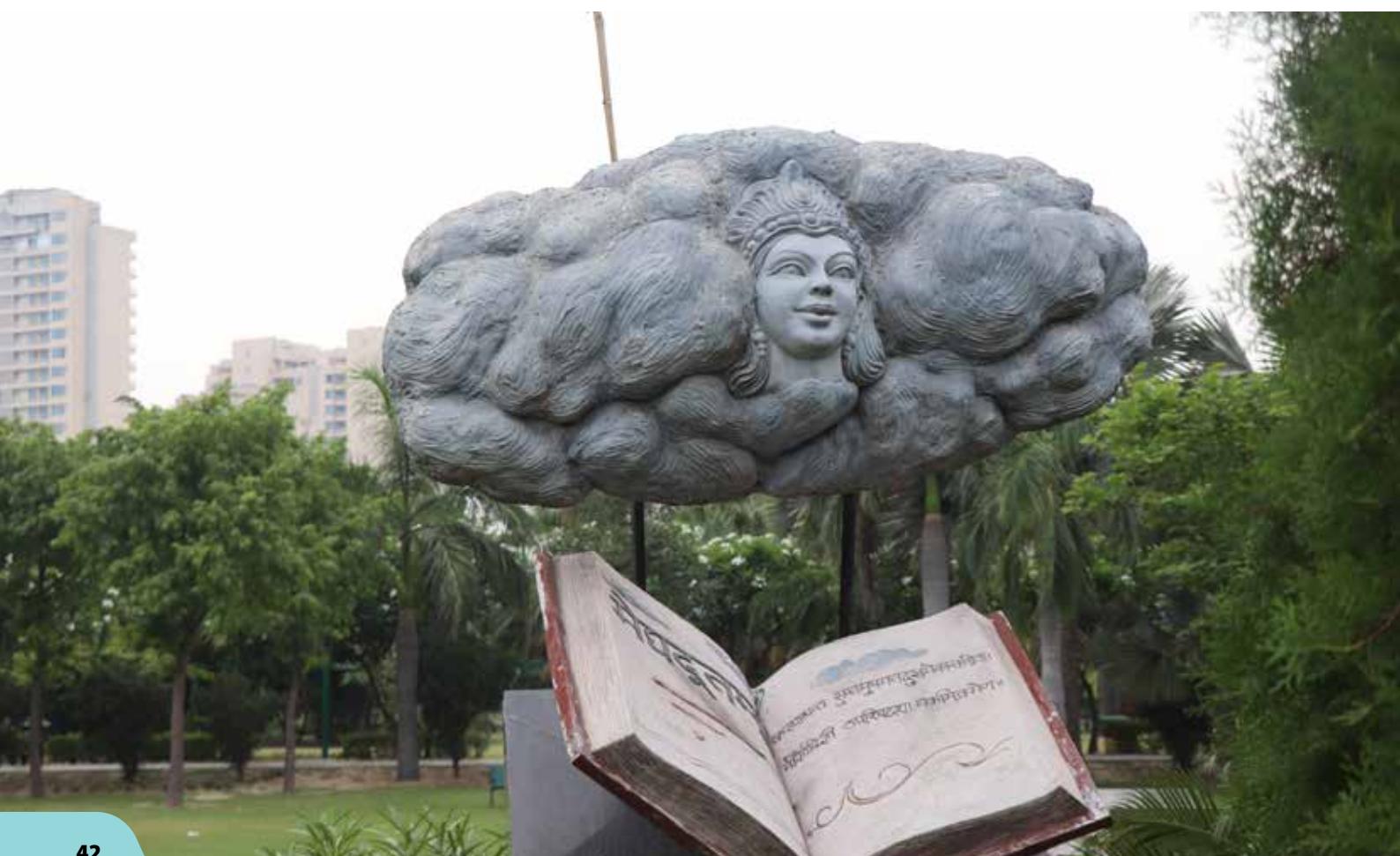
Focus Areas and Goals	Key Actions	Key Stakeholders	Time Frame	Impact (Short / Medium / Long term)
Goal 2.2: Restoration of rivers and flood plains	Desilting, dewatering and use of Nature based Solutions for river restoration	Noida Authority, State Urban Development Department, Biodiversity Management Committee, State Water Resources Department, Research Institutions	Continuous	Short-Medium
	Prevention of sewage discharge into the rivers and their associated canals, through the establishment of decentralised sewage treatment plants at various hotspots	Noida Authority, State Water Resources Department, Resident Welfare Associations, NGOs	Two Years	Long
	Prevention of solid waste disposal in the rivers and their associated canals through household level segregated waste collection and establishment of decentralised organic waste treatment, supplemented with targeted awareness programmes	Noida Authority, State Water Resources Department, Resident Welfare Associations, NGOs	Two Years	Long
	Prevention of discharge of industrial effluents into the rivers and their associated canals by establishment of waste water treatment facilities within the industries	Noida Authority, State Pollution Control Board, Industries, NGOs	Two Years	Long
	Regulation and monitoring of construction activities on the flood plains	Noida Authority, State Urban Development Department, Biodiversity Management Committee, State Water Resources Department, Research Institutions	Continuous	Long
	Assessment and control of invasive species in the rivers and along the flood plains	Noida Authority, Biodiversity Management Committee, Subject Matter Experts, NGOs, State Water Resources Department, State Water Resources Department	Two Years	Long
	Assessment of the levels of degradation in the flood plains	Noida Authority, State Urban Development Department, Biodiversity Management Committee, State Water Resources Department, Research Institutions	One Year	Short
	Afforestation along the flood plains through use of native species	Biodiversity Management Committee, State Urban Development Department, Noida Authority, State Water Resources Department, NGOs, Subject Matter Experts	One Year	Long

Focus Areas and Goals	Key Actions	Key Stakeholders	Time Frame	Impact (Short / Medium / Long term)
Focus Area 3: Parks and Gardens				
Goal 3.1: Improving health and biodiversity of parks and gardens	Undertaking plantations of native species and maintenance of the same	Noida Authority, Biodiversity Management Committee, Resident Welfare Associations, Schools, Colleges, Subject Matter Experts, State Biodiversity Board, State Horticulture Department	Continuous	Long
	Establishment of city level nurseries for saplings of native species	Noida Authority, Biodiversity Management Committee, NGOs	One Year	Medium
	Development of a city specific policy on urban greening	Noida Authority, State Horticulture Department, State Forest Department, Subject Matter Experts	One Year	Long
	City ratification of the above policy	Noida Authority, Biodiversity Management Committee	Six Months	Long
Goal 3.2: Promoting investment in green space development and maintenance	Development of green space management plan (including business cases for private sector investment)	Noida Authority, NGOs, Biodiversity Management Committee, Subject Matter Experts, Research Institutions	One Year	Long
	Promoting private sector investment in development and maintenance of parks and gardens	Noida Authority, Corporates, NGOs, Biodiversity Management Committee	Two Years	Medium
Focus Area 4: Agriculture				
Goal 4.1: Mapping the existing extent of agriculture within the city limits and documenting the crops and practices	Development of a GIS based map of existing agricultural land in the city	Noida Authority, Biodiversity Management Committee, NGOs, Research Institutions, State Agriculture Department	Six Months	Short
	Documentation of the crops sown, practices followed for cultivation and post-harvest processing	Noida Authority, Biodiversity Management Committee, NGOs, Research Institutions, State Agriculture Department	One Year	Short
	Analysis of the change in agricultural area over time, and periodic monitoring of the same	Research Institutions, NGOs, Noida Authority, Biodiversity Management Committee	Six months for initial change analysis, followed by continuous change monitoring	Long

Focus Areas and Goals	Key Actions	Key Stakeholders	Time Frame	Impact (Short / Medium / Long term)
Goal 4.2: Promotion of agriculture through organic farming and other biodiversity friendly methods of cultivation	Promoting home gardens, terrace gardens, kitchen gardens through revisions in existing building bye laws	Noida Authority, State Urban Development Department, State Agriculture Department, Resident Welfare Associations, Biodiversity Management Committee	One Year	Medium
	Awareness generation on existing schemes and subsidies relevant to urban farming	Noida Authority, State Urban Development Department, State Agriculture Department, Resident Welfare Associations, Biodiversity Management Committee, Farmers, NGOs, School and College Students	Continuous	Short
	Providing policy support for urban agriculture, including crop insurance, incentives	Noida Authority, Banks, Micro-finance Institutions, State Agriculture Department, NGOs	One Year	Long
	Awareness generation in schools, colleges and residential complexes on need and significance of urban agriculture and use of locally grown crops and vegetables	Noida Authority, NGOs, Schools, Colleges, Resident Welfare Associations, Biodiversity Management Committee	Continuous	Long
Focus Area 5: Ponds				
Goal 5.1: Mapping the existing pond network within the city and their health status	Development of a GIS based map of the existing pond network	Noida Authority, Research Institutions, Biodiversity Management Committee, State Ground Water Department	One Year	Long
	Identification of the health of each pond and the drivers of degradation and threats for each pond	Biodiversity Management Committee, NGOs, Noida Authority	One Year	Short
Goal 5.2: Undertaking pond restoration through community participation	Development and implementation of action plans for revival and restoration of ponds, with inputs from community members, traditional knowledge holders and subject matter experts	Noida Authority, Corporates, NGOs, Subject Matter Experts, Traditional Knowledge Holders, Resident Welfare Associations, Students	Five Years	Long
	Plantation of native species around existing ponds and establishing waste free zones around the ponds	Noida Authority, Biodiversity Management Committee, NGOs, Corporates, Resident Welfare Associations	One Year	Long
	Awareness generation among citizens on significance of ponds, through techniques like community walks around ponds	NGOs, Schools, Colleges, Resident Welfare Associations, Subject Matter Experts	Continuous	Medium
	Formation of neighbourhood-based pond associations in appropriate ward (s) for regular monitoring of pond health	Biodiversity Management Committee, Research Institutions, Noida Authority, Subject Matter Experts, Resident Welfare Associations	One Year	Long

Focus Areas and Goals	Key Actions	Key Stakeholders	Time Frame	Impact (Short / Medium / Long term)
Focus Area 6: Okhla Bird Sanctuary				
Goal 6.1: Documenting the present condition of Okhla Bird Sanctuary	Assessing the health status of the Sanctuary and the threats to the same	Subject Matter Experts, Research Institutions, Noida Authority, State Forest Department	One Year	Short
	Mapping the invasive species and their spread	State Forest Department, Botanical Survey of India, Zoological Survey of India, Research Institutions, Subject Matter Experts, Noida Authority, State Biodiversity Board, Biodiversity Management Committee	One Year	Short
	Valuing the ecosystem services provided by the Sanctuary	State Forest Department, Subject Matter Experts, Research Institutions, Noida Authority, Biodiversity Management Committee	One Year	Short
Goal 6.2: Restoring and conserving Okhla Bird Sanctuary	Developing and implementing an eco-restoration plan for the Sanctuary using Nature based Solutions	Subject Matter Experts (Restoration Ecologists), Noida Authority, Biodiversity Management Committee, NGOs, Delhi Government, State Forest Department, Corporates	Five Years	Long
	Awareness generation among students about the significance of the Sanctuary through mandatory visits to the Sanctuary	State Forest Department, Noida Authority, Schools, State Education Department, NGOs	Continuous	Medium
	Training local youth as nature guides	State Forest Department, NGOs, Noida Authority, Corporates	Two Years	Long
	Development of a state-of-the-art Nature Interpretation Centre and other tourist facilities for promoting eco-tourism	State Forest Department, Noida Authority, Corporates, NGOs	Two Years	Long
Focus Area 7: Urban Forests				
Goal 7.1: Mapping the existing urban forests and their benefits	Developing a GIS based map of the existing urban forests within the city limits	Noida Authority, Research Institutions, Biodiversity Management Committee, NGOs	One Year	Short
	Documenting the biodiversity in the existing forests	Noida Authority, Research Institutions, Biodiversity Management Committee, NGOs	One Year	Short
	Assessing the health of each urban forest and the drivers of degradation	Noida Authority, Research Institutions, Biodiversity Management Committee, NGOs, Subject Matter Experts	One Year	Short

Focus Areas and Goals	Key Actions	Key Stakeholders	Time Frame	Impact (Short / Medium / Long term)
	Estimating the ecosystem services provided by each urban forest and economic value of the same	Noida Authority, Research Institutions, Biodiversity Management Committee, NGOs, Subject Matter Experts	One Year	Short
Goal 7.2: Promoting development of biodiversity friendly urban forests through ecological restoration	Identification of degraded land parcels for development of urban forests	Noida Authority, Research Institutions, Biodiversity Management Committee, NGOs, State Urban Development Department	One Year	Short
	Development and implementation of site-specific plan for development of urban forest through the process of ecological restoration	Subject Matter Experts (Restoration Ecologists), NGOs, Resident Welfare Associations, Research Institutions, Biodiversity Management Committee, Noida Authority, Corporates	Five Years	Long
	Development of nurseries for saplings of native species	Noida Authority, Biodiversity Management Committee, Corporates, NGOs	One Year	Medium
	Promoting private sector investment in ecological restoration of degraded lands through development and maintenance of urban forests	Noida Authority, Corporates, NGOs, Biodiversity Management Committee	Two Years	Medium



6. Tools to Support Implementation of LBSAP

This section provides links to various tools that can support the implementation of LBSAP of New Okhla Industrial Development Authority (NOIDA). The tools provided in this section are limited. We encourage the implementers to make use of various other tools that would help to deal with the local issues.

6.1. Natural Asset Map

ICLEI South Asia has developed the Natural Asset Map of Noida city with support from HCL Foundation. This map shows the blue-green infrastructure of the city on the Geographic Information Systems (GIS) platform. In order to communicate the significance of the ecosystems in the city to the citizens, an illustrated natural asset map has also been developed for Noida. The infrastructure mapped includes the urban green areas like Avenue tree cover, urban forests, river, Okhla Bird Sanctuary, open green spaces, marshes, ponds and tree patches. By providing a visual interpretation of the existing urban ecosystems, the map will help the city to plan better and include biodiversity conservation into consideration while planning developmental activities.

6.2. NBSAP - LBSAP Guidelines

The LBSAP is the local-level version of National Biodiversity Strategy and Action Plans (NBSAPs), the principal instrument used by national governments for implementing the Convention on Biological Diversity. Guidelines for development and implementation of National, Sub National and Local Biodiversity Strategies and Action Plans is a recently developed toolkit by ICLEI. It comprises of guidelines for development of Biodiversity Strategy and Action Plans at National, Sub National and Local levels. These guidelines have been accepted by the Secretariat of the Convention on Biological Diversity. For more details please visit: <https://cbc.iclei.org/tools/>

6.3. NBSAP of India

The NBSAP is an important instrument for implementing the Convention on Biological Diversity at the national level. Following the CBD mandate, the government of India prepared a macro-level statement of policies and strategies for conservation and sustainable use of biodiversity. Following this the MoEFCC implemented the externally aided NBSAP project from 2000-2004. Later by updating the macro level statement of policies document and by using the final technical report of the NBSAP project and the National Environmental Policy (NEP), Government of India prepared a National Biodiversity Action Plan (NBAP) in 2008 and Addendum in 2014. The NBAP 2008 identifies threats and constraints in biodiversity conservation taking into cognizance the existing legislations, implementation mechanisms, strategies, plans and programmes, based on which action points have been designed. For more details please visit: <https://tinyurl.com/y9w3unal>

6.4. SBSAP of Uttar Pradesh

The Uttar Pradesh State Biodiversity Strategy and Action Plan (2021-2030) (Badola et al., 2022) is an ambitious plan that recognizes the critical need to address the various challenges faced by Uttar Pradesh in terms of biodiversity conservation and sustainable development. The action plan aims to safeguard the state's rich biodiversity, which encompasses diverse ecosystems, flora, and fauna, by implementing a range of targeted actions over the next decade.

The plan encompasses a multifaceted approach that includes enhancing awareness and understanding of biodiversity among various stakeholders, including local communities, policymakers, and the general public. It emphasizes the importance of integrating traditional knowledge and practices into biodiversity conservation efforts, recognizing the valuable insights that indigenous communities possess. The plan also emphasizes the significance of scientific research, data collection, and monitoring to inform evidence-based decision-making and effective management strategies.

One of the key aspects of the action plan is the promotion of sustainable development practices that harmonize economic growth with environmental protection. It recognizes the importance of mainstreaming biodiversity considerations into key sectors such as agriculture, forestry, fisheries, tourism, and urban planning. By incorporating biodiversity considerations into these sectors, the plan aims to minimize negative impacts on ecosystems while ensuring the sustainable use of natural resources.

Furthermore, the strategy plan also highlights the need to strengthen the management of protected areas and forests, as they play a crucial role in preserving biodiversity hotspots and providing habitats for numerous plant and animal species. It focuses on enhancing the capacity of protected area managers, improving infrastructure, and implementing effective conservation measures.

The collaboration between the Uttar Pradesh State Biodiversity Board and the Wildlife Institute of India has ensured that the strategy is based on the latest scientific knowledge and expertise. The plan also acknowledges the importance of partnerships and collaborations with various stakeholders, including government agencies, NGOs, research institutions, and local communities. It encourages the active involvement of these stakeholders in the implementation of the action plan, fostering a sense of ownership and responsibility for biodiversity conservation.

6.5. TEEB Manual

The Economics of Ecosystems and Biodiversity (TEEB) Manual for Cities was prepared based on the TEEB reports and ICLEI and IUCN's Local Action for Biodiversity Project. The manual has information tailored specifically for cities, which highlights how a focus on ecosystem services and their valuation can create direct benefits for cities. It also provides specific case studies and stepwise guidance on how to do this. For more details please visit: <https://tinyurl.com/on5w9um>

6.6. Kunming-Montreal Global Biodiversity Framework

The Global Biodiversity Framework (GBF) builds on the Strategic Plan 2011-2020 and Aichi targets to guide global action on nature through until 2030. The framework is said to be more inclusive, SMART and complex in its addressal of biodiversity loss, restoration of ecosystems and protection of indigenous rights. This will be achieved through four goals to be achieved by 2050 and 23 targets to be met by 2030 (SCBD, 2022).

The Goals which align with the vision for 2050 are:

GOAL A

The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050; Human induced extinction of known threatened species is halted, and, by 2050, extinction rate and risk of all species are reduced tenfold and the abundance of native wild species is increased to healthy and resilient levels;

The genetic diversity within populations of wild and domesticated species, is maintained, safeguarding their adaptive potential.

GOAL B

Biodiversity is sustainably used and managed and nature's contributions to people, including ecosystem functions and services, are valued, maintained and enhanced, with those currently in decline being restored, supporting the achievement of sustainable development for the benefit of present and future generations by 2050.

GOAL C

The monetary and non-monetary benefits from the utilization of genetic resources, and digital sequence information on genetic resources, and of traditional knowledge associated with genetic resources, as applicable, are shared fairly and equitably, including, as appropriate with indigenous peoples and local communities, and substantially increased by 2050, while ensuring traditional knowledge associated with genetic resources is appropriately protected, thereby contributing to the conservation and sustainable use of biodiversity, in accordance with internationally agreed access and benefit-sharing instruments.

GOAL D

Adequate means of implementation, including financial resources, capacity-building, technical and scientific cooperation, and access to and transfer of technology to fully implement the Kunming-Montreal global biodiversity framework are secured and equitably accessible to all Parties, especially developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition, progressively closing the biodiversity finance gap of 700 billion dollars per year, and aligning financial flows with the Kunming-Montreal Global Biodiversity Framework and the 2050 Vision for Biodiversity.

Table 6: Kunming-Montreal Global Biodiversity Framework 23 targets

TARGET 1
Ensure that all areas are under participatory integrated biodiversity inclusive spatial planning and/or effective management processes addressing land and sea use change, to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of indigenous peoples and local communities.
TARGET 2
Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity.
TARGET 3
Ensure and enable that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of indigenous peoples and local communities including over their traditional territories.
TARGET 4
Ensure urgent management actions, to halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species, to significantly reduce extinction risk, as well as to maintain and restore the genetic diversity within and between populations of native, wild and domesticated species to maintain their adaptive potential, including through in situ and ex situ conservation and sustainable management practices, and effectively manage human-wildlife interactions to minimize human-wildlife conflict for coexistence.
TARGET 5
Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal, preventing overexploitation, minimizing impacts on non-target species and ecosystems, and reducing the risk of pathogen spill-over, applying the ecosystem approach, while respecting and protecting customary sustainable use by indigenous peoples and local communities.
TARGET 6
Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 percent, by 2030, eradicating or controlling invasive alien species especially in priority sites, such as islands .
TARGET 7
Reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including: reducing excess nutrients lost to the environment by at least half including through more efficient nutrient cycling and use; reducing the overall risk from pesticides and highly hazardous chemicals by at least half including through integrated pest management, based on science, taking into account food security and livelihoods; and also preventing, reducing, and working towards eliminating plastic pollution.
TARGET 8

Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solution and/or ecosystem-based approaches, while minimizing negative and fostering positive impacts of climate action on biodiversity.

TARGET 9

Ensure that the management and use of wild species are sustainable, thereby providing social, economic and environmental benefits for people, especially those in vulnerable situations and those most dependent on biodiversity, including through sustainable biodiversity-based activities, products and services that enhance biodiversity, and protecting and encouraging customary sustainable use by indigenous peoples and local communities.

TARGET 10

Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches contributing to the resilience and long-term efficiency and productivity of these production systems and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services.

TARGET 11

Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services, such as regulation of air, water, and climate, soil health, pollination and reduction of disease risk, as well as protection from natural hazards and disasters, through nature-based solutions and ecosystem-based approaches for the benefit of all people and nature.

TARGET 12

Significantly increase the area and quality and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably, by mainstreaming the conservation and sustainable use of biodiversity, and ensure biodiversity-inclusive urban planning, enhancing native biodiversity, ecological connectivity and integrity, and improving human health and well-being and connection to nature and contributing to inclusive and sustainable urbanization and the provision of ecosystem functions and services.

TARGET 13

Take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits that arise from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources, and facilitating appropriate access to genetic resources, and by 2030 facilitating a significant increase of the benefits shared, in accordance with applicable international access and benefit-sharing instruments.

TARGET 14

Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors, in particular those with significant impacts on biodiversity, progressively aligning all relevant public and private activities, fiscal and financial flows with the goals and targets of this framework.

TARGET 15

Take legal, administrative or policy measures to encourage and enable business, and in particular to ensure that large and transnational companies and financial institutions:

- (a) Regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity including with requirements for all large as well as transnational companies and financial institutions along their operations, supply and value chains and portfolios;
- (b) Provide information needed to consumers to promote sustainable consumption patterns;
- (c) Report on compliance with access and benefit-sharing regulations and measures, as applicable;

in order to progressively reduce negative impacts on biodiversity, increase positive impacts, reduce biodiversity-related risks to business and financial institutions, and promote actions to ensure sustainable patterns of production.

TARGET 16

Ensure that people are encouraged and enabled to make sustainable consumption choices including by establishing supportive policy, legislative or regulatory frameworks, improving education and access to relevant and accurate information and alternatives, and by 2030, reduce the global footprint of consumption in an equitable manner, halve global food waste, significantly reduce overconsumption and substantially reduce waste generation, in order for all people to live well in harmony with Mother Earth.

TARGET 17

Establish, strengthen capacity for, and implement in all countries in biosafety measures as set out in Article 8(g) of the Convention on Biological Diversity and measures for the handling of biotechnology and distribution of its benefits as set out in Article 19 of the Convention.

TARGET 18

Identify by 2025, and eliminate, phase out or reform incentives, including subsidies harmful for biodiversity, in a proportionate, just, fair, effective and equitable way, while substantially and progressively reducing them by at least 500 billion United States dollars per year by 2030, starting with the most harmful incentives, and scale up positive incentives for the conservation and sustainable use of biodiversity.

TARGET 19

Substantially and progressively increase the level of financial resources from all sources, in an effective, timely and easily accessible manner, including domestic, international, public and private resources, in accordance with Article 20 of the Convention, to implement national biodiversity strategies and action plans, by 2030 mobilizing at least 200 billion United States dollars per year, including by:

- (a) Increasing total biodiversity related international financial resources from developed countries, including official development assistance, and from countries that voluntarily assume obligations of developed country Parties, to developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition, to at least US\$ 20 billion per year by 2025, and to at least US\$ 30 billion per year by 2030;
- (b) Significantly increasing domestic resource mobilization, facilitated by the preparation and implementation of national biodiversity finance plans or similar instruments according to national needs, priorities and circumstances
- (c) Leveraging private finance, promoting blended finance, implementing strategies for raising new and additional resources, and encouraging the private sector to invest in biodiversity, including through impact funds and other instruments;
- (d) Stimulating innovative schemes such as payment for ecosystem services, green bonds, biodiversity offsets and credits, benefit-sharing mechanisms, with environmental and social safeguards
- (e) Optimizing co-benefits and synergies of finance targeting the biodiversity and climate crises,
- (f) Enhancing the role of collective actions, including by indigenous peoples and local communities, Mother Earth centric actions and non-market-based approaches including community based natural resource management and civil society cooperation and solidarity aimed at the conservation of biodiversity
- (g) Enhancing the effectiveness, efficiency and transparency of resource provision and use;

TARGET 20

Ensure that the best available data, information and knowledge, are accessible to decision makers, practitioners and the public to guide effective and equitable governance, integrated and participatory management of biodiversity, and to strengthen communication, awareness-raising, education, monitoring, research and knowledge management and, also in this context, traditional knowledge, innovations, practices and technologies of indigenous peoples and local communities should only be accessed with their free, prior and informed consent, in accordance with national legislation.

TARGET 21

Ensure the full, equitable, inclusive, effective and gender-responsive representation and participation in decision-making, and access to justice and information related to biodiversity by indigenous peoples and local communities, respecting their cultures and their rights over lands, territories, resources, and traditional knowledge, as well as by women and girls, children and youth, and persons with disabilities and ensure the full protection of environmental human rights defenders.

TARGET 22

Ensure gender equality in the implementation of the framework through a gender-responsive approach where all women and girls have equal opportunity and capacity to contribute to the three objectives of the Convention, including by recognizing their equal rights and access to land and natural resources and their full, equitable, meaningful and informed participation and leadership at all levels of action, engagement, policy and decision-making related to biodiversity.

TARGET 23

By 2030, determine cross-sectoral goals and sector-specific goals for sustainable use, and put in place effective legal and policy measures to achieve them, based on ecosystem approaches, environmental principles and close cooperation with users of biodiversity in order to produce gains for biodiversity and human health and well-being

The framework will be implemented primarily through the development of national and local level goals and targets, formulation of regional biodiversity strategies and action plans such as LBSAPs as well as facilitation of periodic review and monitoring of progress at the global scale.

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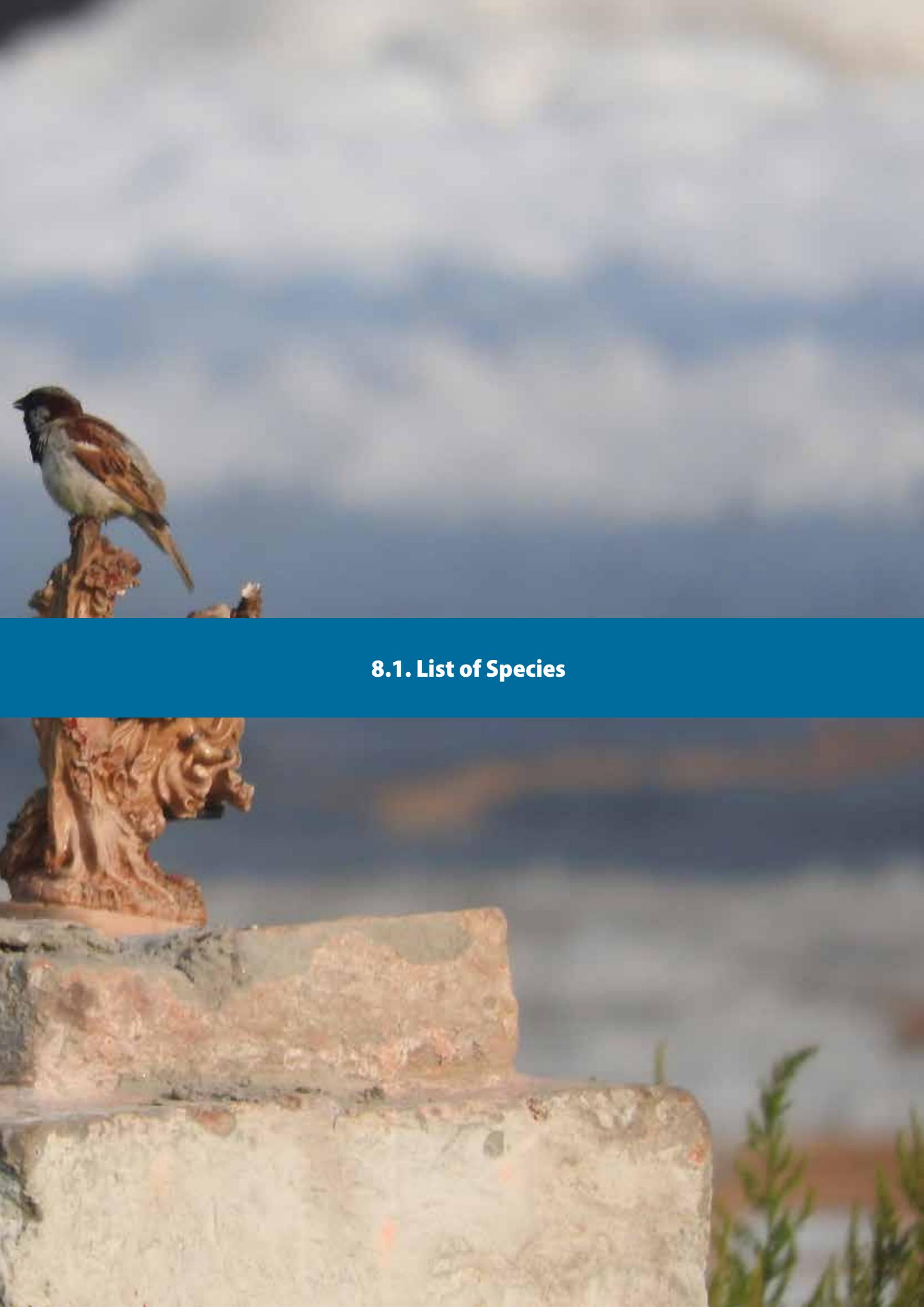
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8. Annexures





8.1. List of Species

Table 1: List of Plants

Sl. No.	Family	Scientific Name	Habit	Nativity
1.	Acanthaceae	<i>Blepharis maderaspatensis</i>	Herb	Native
2.	Acanthaceae	<i>Dicliptera paniculata</i>	Herb	Native
3.	Acanthaceae	<i>Peristrophe paniculata</i>	Herb	Native
4.	Acanthaceae	<i>Rungia pectinata</i>	Herb	Native
5.	Amaranthaceae	<i>Achyranthes aspera</i>	Herb	Native
6.	Amaranthaceae	<i>Alternanthera paronychioides</i>	Herb	Invasive alien
7.	Amaranthaceae	<i>Alternanthera pungens</i>	Herb	Invasive alien
8.	Amaranthaceae	<i>Alternanthera sessilis</i>	Herb	Invasive alien
9.	Amaranthaceae	<i>Amaranthus tricolor</i>	Herb	Native
10.	Amaranthaceae	<i>Amaranthus viridis</i>	Herb	Introduced
11.	Amaranthaceae	<i>Chenopodium album</i>	Herb	Invasive alien
12.	Amaranthaceae	<i>Dysphania ambrosioides</i>	Herb	Introduced
13.	Amaranthaceae	<i>Chenopodium murale</i>	Herb	Invasive alien
14.	Amaranthaceae	<i>Gomphrena celosioides</i>	Herb	Invasive alien
15.	Amaranthaceae	<i>Pupalia lappacea</i>	Herb	Native
16.	Amaranthaceae	<i>Suaeda maritima</i>	Herb	Native
17.	Amaranthaceae	<i>Chenopodium album</i>	Herb	Native
18.	Amaranthaceae	<i>Alternanthera philoxeroides</i>	Herb	Invasive alien
19.	Anacardiaceae	<i>Spondias pinnata</i>	Tree	Native
20.	Anacardiaceae	<i>Mangifera indica</i>	Tree	Introduced
21.	Anacardiaceae	<i>Lannea coromandelica</i>	Tree	Native
22.	Annonaceae	<i>Annona squamosa</i>	Tree	Introduced
23.	Annonaceae	<i>Polyalthia longifolia</i>	Tree	Native
24.	Apiaceae	<i>Centella asiatica</i>	Herb	Native
25.	Apiaceae	<i>Hydrocotyle sibthorpioides</i>	Herb	Native
26.	Apiaceae	<i>Oenanthe javanica</i>	Herb	Native
27.	Apiaceae	<i>Oenanthe javanica</i>	Herb	Introduced
28.	Apocynaceae	<i>Alstonia scholaris</i>	Tree	Native
29.	Apocynaceae	<i>Calotropis gigantea</i>	Tree	Invasive alien
30.	Apocynaceae	<i>Cascabela thevetia</i>	Shrub	Introduced
31.	Apocynaceae	<i>Dregea volubilis</i>	Herb	Native
32.	Apocynaceae	<i>Oxystelma secamone</i>	Climber	Introduced
33.	Apocynaceae	<i>Pergularia daemia</i>	Climber	Native
34.	Apocynaceae	<i>Tabernaemontana divaricata</i>	Climber	Native
35.	Apocynaceae	<i>Thevetia peruviana</i>	Tree	Introduced
36.	Araceae	<i>Lemna perpusilla</i>	Herb	Introduced
37.	Araceae	<i>Spirodela polyrrhiza</i>	Herb	Native
38.	Araceae	<i>Pistia stratiotes</i>	Herb	Invasive alien
39.	Arecaceae	<i>Phoenix sylvestris</i>	Tree	Native
40.	Aristolochiaceae	<i>Aristolochia indica</i>	Tree	Native
41.	Asparagaceae	<i>Asparagus racemosus</i>	Shrub	Native
42.	Asteraceae	<i>Ageratum conyzoides</i>	Herb	Invasive alien
43.	Asteraceae	<i>Cirsium arvense</i>	Herb	Native
44.	Asteraceae	<i>Conyza canadensis</i>	Herb	Introduced
45.	Asteraceae	<i>Cotula hemisphaerica</i>	Herb	Native
46.	Asteraceae	<i>Eclipta prostrata</i>	Herb	Invasive alien
47.	Asteraceae	<i>Enydra fluctuans</i>	Herb	Introduced

Sl. No.	Family	Scientific Name	Habit	Nativity
48.	Asteraceae	<i>Gnaphalium pensylvanicum</i>	Herb	Introduced
49.	Asteraceae	<i>Laggera aurita</i>	Herb	Native
50.	Asteraceae	<i>Launaea nudicaulis</i>	Herb	Native
51.	Asteraceae	<i>Pulicaria crispa</i>	Herb	Native
52.	Asteraceae	<i>Soliva anthemifolia</i>	Herb	Introduced
53.	Asteraceae	<i>Sonchus arvensis</i>	Herb	Introduced
54.	Asteraceae	<i>Tridax procumbens</i>	Herb	Invasive alien
55.	Asteraceae	<i>Vernonia cinerea</i>	Herb	Native
56.	Asteraceae	<i>Xanthium strumarium</i>	Herb	Invasive alien
57.	Asteraceae	<i>Youngia japonica</i>	Herb	Native
58.	Asteraceae	<i>Gnaphalium purpureum</i>	Herb	Invasive alien
59.	Asteraceae	<i>Launea nudicaulis</i>	Herb	Native
60.	Asteraceae	<i>Parthenium hysterophorus</i>	Herb	Invasive alien
61.	Basellaceae	<i>Basella rubra</i>	Climber	Native
62.	Bignoniaceae	<i>Kigelia africana</i>	Tree	Introduced
63.	Bignoniaceae	<i>Tecomella undulata</i>	Shrub	Native
64.	Bignoniaceae	<i>Tabebuia aurea</i>	Tree	Introduced
65.	Bignoniaceae	<i>Kigelia pinnata</i>	Tree	Introduced
66.	Bignoniaceae	<i>Tecoma stans</i>	Tree	Introduced
67.	Bignoniaceae	<i>Fernandoa adenophyllum</i>	Tree	Native
68.	Bignoniaceae	<i>Stereospermum chelonoides</i>	Tree	Native
69.	Bignoniaceae	<i>Spathodea campanulata</i>	Tree	Introduced
70.	Boraginaceae	<i>Cordia dichotoma</i>	Tree	Native
71.	Boraginaceae	<i>Ehretia laevis</i>	Tree	Native
72.	Brassicaceae	<i>Coronopus didymus</i>	Herb	Introduced
73.	Brassicaceae	<i>Rorippa nasturtium-aquaticum</i>	Herb	Introduced
74.	Caesalpiniaceae	<i>Hardwickia binata</i>	Tree	Native
75.	Cannabinaceae	<i>Cannabis sativa</i>	Herb	Introduced
76.	Cleomaceae	<i>Cleome viscosa</i>	Herb	Invasive alien
77.	Combretaceae	<i>Terminalia arjuna</i>	Tree	Native
78.	Combretaceae	<i>Terminalia bellerica</i>	Tree	Native
79.	Combretaceae	<i>Anogeissus latifolia</i>	Tree	Native
80.	Commelinaceae	<i>Commelina benghalensis</i>	Herb	Native
81.	Commelinaceae	<i>Commelina forskalaei</i>	Herb	Native
82.	Commelinaceae	<i>Commelina undulata</i>	Herb	Native
83.	Commelinaceae	<i>Commelina kurzii</i>	Herb	Native
84.	Convolvulaceae	<i>Cuscuta reflexa</i>	Herb	Invasive alien
85.	Convolvulaceae	<i>Ipomoea aquatica</i>	Herb	Native
86.	Convolvulaceae	<i>Ipomoea arachnosperma</i>	Climber	Native
87.	Convolvulaceae	<i>Ipomoea cairica</i>	Climber	Native
88.	Convolvulaceae	<i>Ipomoea fistulosa</i>	Shrub	Introduced
89.	Convolvulaceae	<i>Ipomoea indica</i>	Herb	Introduced
90.	Convolvulaceae	<i>Ipomoea sindica</i>	Climber	Native
91.	Convolvulaceae	<i>Merremia aegyptia</i>	Herb	Introduced
92.	Convolvulaceae	<i>Ipomoea aquatica</i>	Herb	Native
93.	Convolvulaceae	<i>Ipomoea carnea</i>	Shrub	Invasive alien
94.	Cucurbitaceae	<i>Mukia maderaspatana</i>	Climber	Native

Sl. No.	Family	Scientific Name	Habit	Nativity
95.	Cucurbitaceae	<i>Trichosanthes cucumerina</i>	Climber	Native
96.	Cyperaceae	<i>Carex alopecuroides</i>	Sedge	Native (to Himalayas)
97.	Cyperaceae	<i>Cyperus bulbosus</i>	Sedge	Native
98.	Cyperaceae	<i>Cyperus compressus</i>	Sedge	Native
99.	Cyperaceae	<i>Cyperus iria</i>	Sedge	Invasive alien
100.	Cyperaceae	<i>Cyperus kyllingia</i>	Sedge	Native
101.	Cyperaceae	<i>Cyperus nutans</i>	Sedge	Native
102.	Cyperaceae	<i>Cyperus dubius</i>	Sedge	Native
103.	Cyperaceae	<i>Eleocharis palustris</i>	Sedge	Introduced
104.	Cyperaceae	<i>Fimbristylis cymosa</i>	Sedge	Native
105.	Cyperaceae	<i>Fimbristylis dichotoma</i>	Sedge	Native
106.	Cyperaceae	<i>Fimbristylis ferruginea</i>	Sedge	Native
107.	Cyperaceae	<i>Fimbristylis quinquangularis</i>	Sedge	Native
108.	Cyperaceae	<i>Rhynchospora colorata</i>	Sedge	Introduced
109.	Cyperaceae	<i>Schoenoplectiella roylei</i>	Sedge	Native
110.	Cyperaceae	<i>Scirpus littoralis</i>	Sedge	Introduced
111.	Euphorbiaceae	<i>Acalypha indica</i>	Herb	Native
112.	Euphorbiaceae	<i>Croton bonplandianus</i>	Herb	Invasive alien
113.	Euphorbiaceae	<i>Euphorbia heterophylla</i>	Herb	Invasive alien
114.	Euphorbiaceae	<i>Euphorbia granulata</i>	Herb	Native
115.	Euphorbiaceae	<i>Euphorbia hirta</i>	Herb	Invasive alien
116.	Euphorbiaceae	<i>Kirganelia reticulata</i>	Shrub	Native
117.	Euphorbiaceae	<i>Ricinus communis</i>	Herb	Invasive alien
118.	Euphorbiaceae	<i>Jatropha curcas</i>	Shrub	Introduced
119.	Euphorbiaceae	<i>Jatropha integerrima</i>	Tree	Introduced
120.	Fabaceae	<i>Acacia nilotica</i>	Herb	Native
121.	Fabaceae	<i>Albizia lebbeck</i>	Herb	Native
122.	Fabaceae	<i>Alhagi pseudalhagi</i>	Tree	Introduced
123.	Fabaceae	<i>Alysicarpus vaginalis</i>	Herb	Native
124.	Fabaceae	<i>Bauhinia purpurea</i>	Tree	Native
125.	Fabaceae	<i>Cassia tora</i>	Herb	Native
126.	Fabaceae	<i>Cassia occidentalis</i>	Herb	Native
127.	Fabaceae	<i>Dalbergia sissoo</i>	Herb	Native
128.	Fabaceae	<i>Delonix regia</i>	Herb	Introduced
129.	Fabaceae	<i>Desmodium triflorum</i>	Tree	Native
130.	Fabaceae	<i>Enterolobium barinense</i>	Tree	Invasive alien
131.	Fabaceae	<i>Erythrina variegata</i>	Climber	Native
132.	Fabaceae	<i>Indigofera hochstetteri</i>	Herb	Native
133.	Fabaceae	<i>Indigofera linnaei</i>	Herb	Invasive alien
134.	Fabaceae	<i>Leucaena leucocephala</i>	Herb	Invasive alien
135.	Fabaceae	<i>Melilotus alba</i>	Tree	Invasive alien
136.	Fabaceae	<i>Melilotus indica</i>	Herb	Native
137.	Fabaceae	<i>Parkinsonia aculeata</i>	Herb	Introduced
138.	Fabaceae	<i>Pithecellobium dulce</i>	Tree	Introduced
139.	Fabaceae	<i>Pongamia pinnata</i>	Tree	Native
140.	Fabaceae	<i>Prosopis cineraria</i>	Tree	Native
141.	Fabaceae	<i>Prosopis juliflora</i>	Tree	Invasive alien

Sl. No.	Family	Scientific Name	Habit	Nativity
142.	<i>Fabaceae</i>	<i>Rhynchosia minima</i>	Tree	Native
143.	<i>Fabaceae</i>	<i>Tamarindus indica</i>	Tree	Introduced
144.	<i>Fabaceae</i>	<i>Tephrosia pumila</i>	Tree	Native
145.	<i>Fabaceae</i>	<i>Tephrosia purpurea</i>	Tree	Native
146.	<i>Fabaceae</i>	<i>Tephrosia villosa</i>	Tree	Native
147.	<i>Fabaceae</i>	<i>Abrus precatorius</i>	Climber	Native
148.	<i>Fabaceae</i>	<i>Acacia catechu</i>	Tree	Native
149.	<i>Fabaceae</i>	<i>Cassia fistula</i>	Tree	Native
150.	<i>Fabaceae</i>	<i>Clitoria ternata</i>	Herb	Native
151.	<i>Fabaceae</i>	<i>Dalbergia latifolia</i>	Tree	Native
152.	<i>Fabaceae</i>	<i>Desmodium gangeticum</i>	Climber	Native
153.	<i>Fabaceae</i>	<i>Desmodium oojeinesis</i>	Tree	Native
154.	<i>Fabaceae</i>	<i>Guilandina bonduc</i>	Shrub	Native
155.	<i>Fabaceae</i>	<i>Milletia pinnata</i>	Tree	Native
156.	<i>Fabaceae</i>	<i>Albizia procera</i>	Tree	Native
157.	<i>Fabaceae</i>	<i>Butea monosperma</i>	Tree	Native
158.	<i>Fabaceae</i>	<i>Calliandra haematocephala</i>	Tree	Introduced
159.	<i>Fabaceae</i>	<i>Cassia siamea</i>	Tree	Introduced
160.	<i>Fabaceae</i>	<i>Pongamia glabra</i>	Tree	Native
161.	<i>Fabaceae</i>	<i>Senegalalia rugata</i>	Tree	Native
162.	<i>Fabaceae</i>	<i>Pterocarpus marsupium</i>	Tree	Native
163.	<i>Fabaceae</i>	<i>Bauhinia forficata</i>	Tree	Introduced
164.	<i>Lamaceae</i>	<i>Ocimum gratissimum</i>	Herb	Native
165.	<i>Lamaceae</i>	<i>Ocimum tenuiflorum</i>	Herb	Native
166.	<i>Lamiaceae</i>	<i>Mentha spicata</i>	Herb	Introduced
167.	<i>Lamiaceae</i>	<i>Gmelina arborea</i>	Tree	Native
168.	<i>Loganiaceae</i>	<i>Strychnos nux-vomica</i>	Tree	Native
169.	<i>Lythraceae</i>	<i>Lagerstroemia parviflora</i>	Tree	Introduced
170.	<i>Lythraceae</i>	<i>Lagerstroemia speciosa</i>	Tree	Introduced
171.	<i>Lythraceae</i>	<i>Punica granatum</i>	Tree	Introduced
172.	<i>Malvaceae</i>	<i>Abutilon indicum</i>	Shrub	Native
173.	<i>Malvaceae</i>	<i>Bombax ceiba</i>	Tree	Native
174.	<i>Malvaceae</i>	<i>Hibiscus micranthus</i>	Herb	Native
175.	<i>Malvaceae</i>	<i>Malva parviflora</i>	Herb	Introduced
176.	<i>Malvaceae</i>	<i>Malvastrum coromandelianum</i>	Herb	Invasive alien
177.	<i>Malvaceae</i>	<i>Sida acuta</i>	Herb	Invasive alien
178.	<i>Malvaceae</i>	<i>Sida cordifolia</i>	Herb	Native
179.	<i>Malvaceae</i>	<i>Sida rhombifolia</i>	Herb	Native
180.	<i>Malvaceae</i>	<i>Urena lobata</i>	Herb	Invasive alien
181.	<i>Malvaceae</i>	<i>Ceiba pentandra</i>	Tree	Introduced
182.	<i>Malvaceae</i>	<i>Guazuma ulmifolia</i>	Tree	Introduced
183.	<i>Malvaceae</i>	<i>Helicteres isora</i>	Tree	Native
184.	<i>Malvaceae</i>	<i>Sterculia urens</i>	Tree	Native
185.	<i>Malvaceae</i>	<i>Pterospermum acerifolium</i>	Tree	Native
186.	<i>Malvaceae</i>	<i>Grewia tiliifolia</i>	Tree	Native
187.	<i>Malvaceae</i>	<i>Hildegardia populifolia</i>	Tree	Native
188.	<i>Meliaceae</i>	<i>Azadirachta indica</i>	Tree	Introduced

Sl. No.	Family	Scientific Name	Habit	Nativity
189.	Meliaceae	<i>Melia azedarach</i>	Tree	Introduced
190.	Menispermaceae	<i>Tinospora sinensis</i>	Climber	Native
191.	Moraceae	<i>Ficus benghalensis</i>	Tree	Native
192.	Moraceae	<i>Ficus benjamina</i>	Tree	Native
193.	Moraceae	<i>Ficus palmata</i>	Shrub	Native
194.	Moraceae	<i>Ficus racemosa</i>	Tree	Native
195.	Moraceae	<i>Ficus religiosa</i>	Tree	Native
196.	Moraceae	<i>Morus alba</i>	Tree	Native
197.	Moraceae	<i>Ficus carica</i>	Tree	Introduced
198.	Moraceae	<i>Ficus racemosa</i>	Tree	Native
199.	Moraceae	<i>Ficus virens</i>	Tree	Native
200.	Myrtaceae	<i>Syzygium cumini</i>	Tree	Native
201.	Myrtaceae	<i>Psidium guajava</i>	Tree	Introduced
202.	Myrtaceae	<i>Melaleuca virinalis</i>	Tree	Introduced
203.	Myrtaceae	<i>Callistemon lanceolatus</i>	Tree	Introduced
204.	Myrtaceae	<i>Corymbia torelliana</i>	Tree	Introduced
205.	Nelumbonaceae	<i>Nelumbo nucifera</i>	Herb	Native
206.	Nyctaginaceae	<i>Boerhavia diffusa</i>	Herb	Native
207.	Oxalidaceae	<i>Oxalis corniculata</i>	Herb	Invasive alien
208.	Papaveraceae	<i>Argemone mexicana</i>	Herb	Invasive alien
209.	Papaveraceae	<i>Argemone ochroleuca</i>	Herb	Introduced
210.	Phyllanthaceae	<i>Phyllanthus emblica</i>	Tree	Native
211.	Piperaceae	<i>Piper longum</i>	Climber	Introduced
212.	Poaceae	<i>Arundo donax</i>	Grass	Native
213.	Poaceae	<i>Avena sterilis</i>	Grass	Introduced
214.	Poaceae	<i>Brachiaria distachya</i>	Grass	Native
215.	Poaceae	<i>Brachiaria ramosa</i>	Grass	Native
216.	Poaceae	<i>Cenchrus ciliaris</i>	Grass	Native
217.	Poaceae	<i>Cynodon dactylon</i>	Grass	Native
218.	Poaceae	<i>Dactyloctenium aegyptium</i>	Grass	Native
219.	Poaceae	<i>Dichanthium annulatum</i>	Grass	Native
220.	Poaceae	<i>Eragrostis pilosa</i>	Grass	Native
221.	Poaceae	<i>Imperata cylindrica</i>	Grass	Invasive alien
222.	Poaceae	<i>Ischaemum indicum</i>	Grass	Native
223.	Poaceae	<i>Oplismenus burmannii</i>	Grass	Introduced
224.	Poaceae	<i>Paspalum distichum</i>	Grass	Introduced
225.	Poaceae	<i>Pennisetum glaucum</i>	Grass	Introduced
226.	Poaceae	<i>Phragmites karka</i>	Grass	Native
227.	Poaceae	<i>Polypogon fugax</i>	Grass	Native
228.	Poaceae	<i>Saccharum bengalense</i>	Grass	Native
229.	Poaceae	<i>Saccharum spontaneum</i>	Grass	Invasive alien
230.	Poaceae	<i>Vetiveria zizanioides</i>	Grass	Native
231.	Poaceae	<i>Coix lachryma-jobi</i>	Grass	Introduced
232.	Poaceae	<i>Cymbopogon citratus</i>	Grass	Native
233.	Poaceae	<i>Cymbopogon martini</i>	Grass	Native
234.	Poaceae	<i>Dicanthium annulatum</i>	Herb	Native
235.	Poaceae	<i>Elesine indica</i>	Herb	Native

Sl. No.	Family	Scientific Name	Habit	Nativity
236.	Poaceae	<i>Saccharum spontaneum</i>	Grass	Invasive alien
237.	Polygonaceae	<i>Persicaria barbata</i>	Herb	Native
238.	Polygonaceae	<i>Polygonum glabrum</i>	Herb	Introduced
239.	Polygonaceae	<i>Polygonum hydropiper</i>	Herb	Native
240.	Polygonaceae	<i>Polygonum lapathifolia</i>	Herb	Native
241.	Polygonaceae	<i>Polygonum plebeium</i>	Herb	Native
242.	Polygonaceae	<i>Rumex dentatus</i>	Herb	Native
243.	Pontederiaceae	<i>Eichhornia crassipes</i>	Herb	Invasive alien
244.	Portulacaceae	<i>Portulaca oleracea</i>	Herb	Invasive alien
245.	Primulaceae	<i>Anagallis arvensis</i>	Herb	Invasive alien
246.	Primulaceae	<i>Anagallis arvensis</i>	Herb	Native
247.	Proteaceae	<i>Grevillea robusta</i>	Tree	Introduced
248.	Putranjivaceae	<i>Putranjiva roxburghii</i>	Tree	Native
249.	Ranunculaceae	<i>Ranunculus sceleratus</i>	Herb	Native
250.	Rhamnaceae	<i>Zizyphus mauritiana</i>	Tree	Native
251.	Rhamnaceae	<i>Zizyphus nummularia</i>	Shrub	Native
252.	Rhamnaceae	<i>Ziziphus mauritiana</i>	Tree	Native
253.	Rhamnaceae	<i>Ziziphus nummularia</i>	Shrub	Native
254.	Rubiaceae	<i>Oldenlandia corymbosa</i>	Herb	Native
255.	Rubiaceae	<i>Mitragyna parviflora</i>	Tree	Native
256.	Rubiaceae	<i>Neolamarckia cadamba</i>	Tree	Native
257.	Rubiaceae	<i>Guettarda speciosa</i>	Shrub	Native
258.	Rutaceae	<i>Glycosmis pentaphylla</i>	Climber	Native
259.	Rutaceae	<i>Aegle marmelos</i>	Tree	Native
260.	Rutaceae	<i>Murraya paniculata</i>	Tree	Native
261.	Salvadoraceae	<i>Salvadora oleoides</i>	Shrub	Native
262.	Salviniaceae	<i>Azolla pinnata</i>	Fern	Native
263.	Salviniaceae	<i>Salvinia auriculata</i>	Fern	Introduced
264.	Sapindaceae	<i>Dodonea viscosa</i>	Shrub	Introduced
265.	Sapindaceae	<i>Schleichera oleosa</i>	Tree	Native
266.	Sapotaceae	<i>Mimusops elengi</i>	Tree	Native
267.	Sapotaceae	<i>Madhuca nerifolia</i>	Tree	Native
268.	Sapotaceae	<i>Madhuca longifolia</i>	Tree	Native
269.	Sapotaceae	<i>Manilkara hexandra</i>	Tree	Native
270.	Scrophulariaceae	<i>Kickxia ramosissima</i>	Herb	Native
271.	Scrophulariaceae	<i>Mazus pumilus</i>	Herb	Native
272.	Simaroubaceae	<i>Ailanthus excelsa</i>	Tree	Native
273.	Solanaceae	<i>Datura metel</i>	Herb	Introduced
274.	Solanaceae	<i>Nicotiana plumbaginifolia</i>	Herb	Invasive alien
275.	Solanaceae	<i>Solanum nigrum</i>	Herb	Native
276.	Solanaceae	<i>Solanum surattense</i>	Herb	Native
277.	Solanaceae	<i>Withania somnifera</i>	Herb	Native
278.	Tamaricaceae	<i>Tamarix dioica</i>	Shrub	Native
279.	Typhaceae	<i>Typha angustifolia</i>	Herb	Native
280.	Typhaceae	<i>Typha elephantina</i>	Herb	Native
281.	Typhaceae	<i>Typha angustata</i>	Herb	Invasive alien
282.	Ulmaceae	<i>Holoptelea integrifolia</i>	Tree	Native

Sl. No.	Family	Scientific Name	Habit	Nativity
283.	Verbenaceae	<i>Phyla nodiflora</i>	Herb	Native
284.	Verbenaceae	<i>Clerodendrum indicum</i>	Shrub	Native
285.	Verbenaceae	<i>Duranta repens</i>	Shrub	Introduced
286.	Verbenaceae	<i>Tectona grandis</i>	Tree	Native
287.	Verbenaceae	<i>Lantana camara</i>	Shrub	Invasive alien

Table 2: List of Fish

Sl. No.	Name of species	Family
1.	<i>Acanthocobitis botia</i>	Nemacheilidae
2.	<i>Ailia coila</i>	Ailiidae
3.	<i>Amblypharyngodon mola</i>	Cyprinidae
4.	<i>Anabas testudineus</i>	Anabantidae
5.	<i>Aspidoparia jaya</i>	Cyprinidae
6.	<i>Bagarius bagarius</i>	Sisoridae
7.	<i>Bangana dero</i>	Cyprinidae
8.	<i>Barilius barila</i>	Cyprinidae
9.	<i>Botia lohachata</i>	Botiidae
10.	<i>Cabdio morar</i>	Cyprinidae
11.	<i>Catla catla</i>	Cyprinidae
12.	<i>Chagunius chagunio</i>	Cyprinidae
13.	<i>Chanda nama</i>	Ambassidae
14.	<i>Channa marulius</i>	Channidae
15.	<i>Channa punctata</i>	Channidae
16.	<i>Channa striata</i>	Channidae
17.	<i>Chitala chitala</i>	Notopteridae
18.	<i>Cirrhinus mrigala</i>	Cyprinidae
19.	<i>Cirrhinus reba</i>	Cyprinidae
20.	<i>Clarias batrachus</i>	Clariidae
21.	<i>Clarias gariepinus</i>	Heteropneustidae
22.	<i>Clarias garua</i>	Schilbeidae
23.	<i>Crossocheilus latius</i>	Cyprinidae
24.	<i>Ctenopharyngodon idella</i>	Cyprinidae
25.	<i>Cyprinus carpio</i>	Cyprinidae
26.	<i>Esomus danicus</i>	Cyprinidae
27.	<i>Eutropiichthys murius</i>	Schilbeidae
28.	<i>Eutropiichthys vacha</i>	Schilbeidae
29.	<i>Gagata cenia</i>	Sisoridae
30.	<i>Glossogobius giuris</i>	Tetraodontidae
31.	<i>Gogangra viridescens</i>	Sisoridae
32.	<i>Gonialosa manmina</i>	Engraulidae
33.	<i>Gudusia chapra</i>	Clupeidae
34.	<i>Heteropneustes fossilis</i>	Schilbeidae
35.	<i>Hypophthalmichthys molitrix</i>	Cyprinidae
36.	<i>Hypophthalmichthys nobilis</i>	Cyprinidae
37.	<i>Johnius coitor</i>	Nandidae



Sl. No.	Name of species	Family
38.	<i>Labeo angra</i>	Cyprinidae
39.	<i>Labeo bata</i>	Cyprinidae
40.	<i>Labeo calbasu</i>	Cyprinidae
41.	<i>Labeo dyocheilus</i>	Cyprinidae
42.	<i>Labeo gonius</i>	Cyprinidae
43.	<i>Labeo pangusia</i>	Cyprinidae
44.	<i>Labeo rohita</i>	Cyprinidae
45.	<i>Leiodon cutcutia</i>	Mastacembelidae
46.	<i>Macrognathus aral</i>	Mastacembelidae
47.	<i>Mastacembelus armatus</i>	Mastacembelidae
48.	<i>Mastacembelus pancalus</i>	Mastacembelidae
49.	<i>Mystus bleekeri</i>	Bagridae
50.	<i>Mystus cavasius</i>	Bagridae
51.	<i>Mystus tengara</i>	Bagridae
52.	<i>Mystus vittatus</i>	Bagridae
53.	<i>Nandus nandus</i>	Nandidae
54.	<i>Neotropius atherinoides</i>	Schilbeidae
55.	<i>Notopterus notopterus</i>	Notopteridae
56.	<i>Ompok bimaculatus</i>	Siluridae
57.	<i>Ompok pabda</i>	Siluridae
58.	<i>Oreochromis niloticus</i>	Anabantidae
59.	<i>Osteobrama cotio cotio</i>	Cyprinidae
60.	<i>Oxygaster bacaila</i>	Cyprinidae
61.	<i>Pangasius pangasius</i>	Pangasiidae
62.	<i>Parambassis ranga</i>	Ambassidae
63.	<i>Pethia conchonius</i>	Cyprinidae
64.	<i>Pethia ticto</i>	Cyprinidae
65.	<i>Puntius sophore</i>	Cyprinidae
66.	<i>Raiamas bola</i>	Cyprinidae
67.	<i>Rasbora daniconius</i>	Cyprinidae
68.	<i>Rhinomugil corsula</i>	Mugilidae
69.	<i>Rita rita</i>	Claridae
70.	<i>Salmophasia bacaila</i>	Cyprinidae
71.	<i>Securicula gora</i>	Cobitidae
72.	<i>Setipinna phasa</i>	Cyprinidae
73.	<i>Sicamugil cascasia</i>	Belonidae
74.	<i>Silonia silondia</i>	Pangasiidae
75.	<i>Sperata aor</i>	Bagridae
76.	<i>Sperata seenghala</i>	Bagridae
77.	<i>Systemus sarana</i>	Cyprinidae
78.	<i>Trichogaster fasciata</i>	Osphronemidae
79.	<i>Trichogaster lalius</i>	Channidae
80.	<i>Wallago attu</i>	Siluridae
81.	<i>Xenentodon cancila</i>	Ambassidae

Table 3: List of Butterflies

Sl. No.	Scientific Name	Common Name
1.	<i>Acraea terpsicore</i>	Tawny Coster
2.	<i>Aglais kaschmirensis</i>	Indian Tortoiseshell
3.	<i>Agonopterix argillacea</i>	Tortricid Moth
4.	<i>Altha subnotata</i>	Slug Moth
5.	<i>Amyna punctum</i>	Amynna Moth
6.	<i>Antheraea mylitta</i>	Tussar Silk Moth
7.	<i>Argynnis hyperbium</i>	Indian Fritillary
8.	<i>Ariadne ariadne</i>	Angled Castor
9.	<i>Ariadne merione</i>	Common Castor
10.	<i>Azanus ubaldus</i>	Bright Babul Blue
11.	<i>Belenois aurota</i>	Indian Pioneer
12.	<i>Callopistria maillardi</i>	Callopistria Moth
13.	<i>Catochrysops strabo</i>	Forget Me Not Butterfly
14.	<i>Catopsilia pomona</i>	Lemon Emigrant
15.	<i>Catopsilia pyranthe</i>	Mottled Emigrant
16.	<i>Chilades pandava</i>	Oriental Plains Cupid
17.	<i>Chrysodeixis acuta</i>	Tunbridge Wells
18.	<i>Cnaphalocrocis medinalis</i>	Rice Leaf
19.	<i>Colotis amata</i>	Desert Small Salmon Arab
20.	<i>Condica illecta</i>	Groundling Moth
21.	<i>Creatonotos gangis</i>	Aarctiine Moth
22.	<i>Danaus chrysippus</i>	Plain Tiger Butterfly
23.	<i>Daphnis nerii</i>	Oleander Hawk Moth
24.	<i>Delias eucharis</i>	Common Jezebel
25.	<i>Eretmocera impactella</i>	Gelechia Moth
26.	<i>Euchrysops cneus</i>	Gram Blue
27.	<i>Eurema brigitta</i>	Redline Small Grass Yellow
28.	<i>Eurema hecabe</i>	Common Grass Yellow
29.	<i>Fissicrambus mutabilis</i>	Veneer Moth
30.	<i>Graphium doson</i>	Common Jay
31.	<i>Graphium policenes</i>	Common Swordtail
32.	<i>Hasora chromus</i>	Common Banded Awl
33.	<i>Helicoverpa armigera</i>	Cotton Bollworm Moth
34.	<i>Hyperythra lutea</i>	Geometrid Moth
35.	<i>Hypolimnas bolina</i>	Oriental Great Eggfly
36.	<i>Hypolimnas misippus</i>	Daniad Eggfly
37.	<i>Ixias pyrene</i>	Yellow Orange Tip
38.	<i>Junonia almana</i>	Peacock Pansy
39.	<i>Junonia hierta</i>	Yellow Pansy
40.	<i>Junonia lemonias</i>	Lemon Pansy
41.	<i>Junonia orithya</i>	Blue Pansy
42.	<i>Lepisma saccharinum</i>	Common Silverfish
43.	<i>Leptotes plinius</i>	Zebra Blue
44.	<i>Luthrodes pandava</i>	Plains Cupid

Sl. No.	Scientific Name	Common Name
45.	<i>Melanitis leda</i>	Common Evening Brown
46.	<i>Omiodes accepta</i>	Sugarcane Leaf Roller
47.	<i>Ophiusa tirhaca</i>	Green Drab
48.	<i>Orphanostigma abruptalis</i>	
49.	<i>Pachliopta aristolochiae</i>	Common Rose
50.	<i>Papilio demoleus</i>	Lime Swallowtail
51.	<i>Papilio polytes</i>	Common Mormon
52.	<i>Paraponyx fluctuosalis</i>	Rice Case Worm
53.	<i>Pelopidas mathias</i>	Dakhan Small Branded Swift
54.	<i>Phalanta phalantha</i>	Common Leopard Butterfly
55.	<i>Pieris canidia</i>	Indian Cabbage White
56.	<i>Pieris rapae</i>	Small White
57.	<i>Pseudozizeeria maha</i>	Pale Grass Blue
58.	<i>Scirpophaga incertulas</i>	Rice Yellow Stem Borer
59.	<i>Sdania genutia</i>	Striped Tiger
60.	<i>Spindasis vulcanus</i>	Common Silverline
61.	<i>Spoladria recurvalis</i>	Beet Webworm Moth
62.	<i>Suastus gremius</i>	Indian Palm Bob
63.	<i>Syntomoides imao</i>	Handmaiden moth
64.	<i>Tarucus nara</i>	Striped Pierrot
65.	<i>Telicota colon</i>	Pale Palm Dart
66.	<i>Tirumala Limniace</i>	Blue Tiger
67.	<i>Trigonodes hyppasia</i>	Triangles or Semi-Looper
68.	<i>Utethesia pulchelloides</i>	Heliotrope Moth
69.	<i>Vanessa cardui</i>	Painted Lady
70.	<i>Westermannia superba</i>	
71.	<i>Zizeeria karsandra</i>	Dark Grass Blue
72.	<i>Zizula hylax</i>	Tiny Grass Blue

Table 4: List of Insects

Sl. No.	Scientific Name	Common Name
1	<i>Acherontia styx</i>	Eastern Death's Head hawk
2	<i>Apis dorsata</i>	Giant Honey Bee
3	<i>Apis florea</i>	Red Dwarf-Honey Bee
4	<i>Asian Honey Bee</i>	<i>Apis cerana</i>
5	<i>Aulacophora indica</i>	Cucurbit beetle
6	<i>Bagrada hilaris</i>	Bagrada Bug
7	<i>Bicolored Shield Ant</i>	<i>Meranoplus bicolor</i>
8	<i>Camponotus compressus</i>	Indian Black Ant
9	<i>Campsomeriella collaris</i>	Scoliid wasp
10	<i>Daphnis nerii</i>	Oleander Hawkmoth
11	<i>Dysedercus sp.</i>	Cotton Stainer Bug
12	<i>Eristalinus megacephalus</i>	Big-headed Lagoon Fly
13	<i>Euborellia annulipes</i>	Ring-legged Earwig
14	<i>Gametis versicolor</i>	Indian Flower Chafer

Sl. No.	Scientific Name	Common Name
15	<i>Hycleus biundulatus</i>	Blister beetle
16	<i>Orthetrum pruinosum</i>	Crimson-tailed Marsh Hawk
17	<i>Pantala flavescens</i>	Wandering Glider
18	<i>Plexippus paykulli</i>	Pantropical Jumping Spider
19	<i>Poekilocerus pictus</i>	Painted Grasshopper
20	<i>Polistes stigma</i>	Tropical Paper Wasp
21	<i>Rhodothemis rufa</i>	Rufous Marsh Glider

Table 5: List of Mammals

Sl. No.	Local Name	Scientific Name	Family
1	Five-striped palm Squirrel	<i>Funambulus pennantii</i>	Sciuridae
2	House Rat	<i>Rattus rattus</i>	Muridae
3	House Shrew	<i>Suncus murinus</i>	Soricidae
4	Indian Bush Rat	<i>Golunda ellioti</i>	Muridae
5	Indian Flying Fox	<i>Pteropus giganteus</i>	Pteropodidae
6	Indian Hare	<i>Lepus nigricollis</i>	Leporidae
7	Indian Porcupine	<i>Hystrix indica</i>	Hystricidae
8	Large Bandicoot Rat	<i>Bandicota indica</i>	Muridae
9	Lesser Bandicoot Rat	<i>Bandicota bengalensis</i>	Muridae
10	Little Indian Field Mouse	<i>Mus booduga</i>	Muridae
11	Nilgai	<i>Boselaphus tragocamelus</i>	Bovidae
12	Small Indian Mongoose	<i>Herpestes ja vanicus</i>	Herpestidae

Table 6: List of Reptiles

Sl. No.	Scientific Name	Common Name
1	<i>Python molurus</i>	Indian Python
2	<i>Calotes versicolor</i>	Oriental Garden Lizard
3	<i>Naja naja</i>	Spectacled Cobra
4	<i>Varanus bengalensis</i>	Bengal Monitor Lizard
5	<i>Eryx conicus</i>	Common Sand Boa
6	<i>Ptyas mucosa</i>	Indian Rat Snake

Table 7: List of Aquatic Flora and Fauna

Sl. No.	Scientific Name	Vernacular Name
Introduced		
Aquatic Plants		
1	<i>Nelumbo nucifera</i>	Kamal
2	<i>Nymphaea caerulea</i>	Blue Kumud
3	<i>Nymphaea colorata</i>	Violet Kumud
4	<i>Nymphaea mexicana</i>	Yellow Kumud
5	<i>Nymphaea pubescens</i>	White Kumud
6	<i>Nymphaea rubra</i>	Red Kumud
7	<i>Victoria amazonica</i>	Victoria

Sl. No.	Scientific Name	Vernacular Name
Fauna		
1	<i>Labeo catla</i>	Catla
2	<i>Labeo rohita</i>	Rohu
Naturally Occurring		
Flora: Phytoplankton		
1	<i>Chlamydomonas reinhardtii</i>	Chlamydomonas
2	<i>Chlorella vulgaris</i>	Chlorella
3	<i>Closterium ehrenbergii</i>	Closterium
4	<i>Eudorina elegans</i>	Eudorina
5	<i>Fragilaria sp.</i>	Fragilaria
6	<i>Navicula cryptocephala</i>	Navicula
7	<i>Pediastrum simplex</i>	Pediastrum
8	<i>Phacus longicauda</i>	Phacus
9	<i>Scenedesmus quadricauda</i>	Scenedesmus
10	<i>Spirogyra sp.</i>	Spirogyra
11	<i>Zygnema sp.</i>	Zygnema
Macro-algae		
1	<i>Chara sp.</i>	Chara
Macrophytes		
1	<i>Ceratophyllum demersum</i>	Hornwort
2	<i>Hydrilla verticillata</i>	Water thyme
3	<i>Potamogeton crispus</i>	Curled pondweed
4	<i>Potamogeton nodosus</i>	Long leaf pond weed
5	<i>Vallisneria spiralis</i>	Vallisneria
Fauna: Zooplankton		
1	<i>Chironomids</i>	Chironomids
2	<i>Cybister sp. Larvae</i>	Cybister
3	<i>Cyclops bicuspidatus</i>	Cyclops
4	<i>Cyclops sp.</i>	Nauplius larva
5	<i>Daphnia magna</i>	Daphnia
6	<i>Gerris sp.</i>	Pond Skater
7	<i>Moina macrocopa</i>	Moina
8	<i>Ranatra sp.</i>	Water stick insect
9	<i>Tubifex tubifex</i>	Sludge worm



Table 8: List of Birds

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident
Waterfowl				
1	Lesser Whistling-Duck	<i>Dendrocygna javanica</i>	Anseriformes	Resident
2	Bar-headed Goose	<i>Anser indicus</i>	Anseriformes	Migrant
3	Greylag Goose	<i>Anser anser</i>	Anseriformes	Migrant
4	Greater White-fronted Goose	<i>Anser albifrons</i>	Anseriformes	Migrant
5	Knob-billed Duck (Comb Duck)	<i>Sarkidiornis melanotos</i>	Anseriformes	Resident
6	Ruddy Shelduck (Brahminy Duck)	<i>Tadorna ferruginea</i>	Anseriformes	Migrant
7	Common Shelduck	<i>Tadorna tadorna</i>	Anseriformes	Migrant
8	Cotton Pygmy-Goose (Cotton Teal)	<i>Nettapus coromandelianus</i>	Anseriformes	Resident
9	Garganey	<i>Spatula querquedula</i>	Anseriformes	Migrant
10	Northern Shoveler	<i>Spatula clypeata</i>	Anseriformes	Migrant
11	Gadwall	<i>Mareca strepera</i>	Anseriformes	Migrant
12	Falcated Duck	<i>Mareca falcata</i>	Anseriformes	Migrant
13	Eurasian Wigeon	<i>Mareca penelope</i>	Anseriformes	Migrant
14	Indian Spot-billed Duck	<i>Anas poecilorhyncha</i>	Anseriformes	Resident
15	Mallard	<i>Anas platyrhynchos</i>	Anseriformes	Migrant
16	Northern Pintail	<i>Anas acuta</i>	Anseriformes	Migrant
17	Green-winged Teal (Common Teal)	<i>Anas crecca</i>	Anseriformes	Migrant
18	Red-crested Pochard	<i>Netta rufina</i>	Anseriformes	Migrant
19	Common Pochard	<i>Aythya ferina</i>	Anseriformes	Migrant
20	Ferruginous Duck (Ferruginous Pochard)	<i>Aythya nyroca</i>	Anseriformes	Migrant
21	Tufted Duck	<i>Aythya fuligula</i>	Anseriformes	Migrant
22	Greater Scaup	<i>Aythya marila</i>	Anseriformes	Migrant
Grouse, Quail, and Allies				
23	Indian Peafowl	<i>Pavo cristatus</i>	Phasianidae	Resident
24	Grey Francolin	<i>Ortygornis pondicerianus</i>	Phasianidae	Resident
25	Black Francolin	<i>Francolinus francolinus</i>	Phasianidae	Resident
26	Common Quail	<i>Coturnix coturnix</i>	Phasianidae	Migrant
27	Rain Quail	<i>Coturnix coromandelica</i>	Phasianidae	Resident
Flamingos				
28	Greater Flamingo	<i>Phoenicopterus roseus</i>	Phoenicopteridae	Migrant
	Grebes			
29	Little Grebe	<i>Tachybaptus ruficollis</i>	Podicipedidae	Resident
30	Great Crested Grebe	<i>Podiceps cristatus</i>	Podicipedidae	Migrant
31	Eared Grebe (Black-necked Grebe)	<i>Podiceps nigricollis</i>	Podicipedidae	Migrant
Pigeons and Doves				
32	Rock Pigeon (Blue Rock Pigeon)	<i>Columba livia</i>	Columbidae	Resident
33	Oriental Turtle-Dove	<i>Streptopelia orientalis</i>	Columbidae	Migrant
34	Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	Columbidae	Resident
35	Red Collared-Dove (Red Turtle-Dove)	<i>Streptopelia tranquebarica</i>	Columbidae	Resident
36	Spotted Dove	<i>Spilopelia chinensis</i>	Columbidae	Migrant
37	Laughing Dove (Little Brown Dove)	<i>Spilopelia senegalensis</i>	Columbidae	Resident
38	Orange-breasted Green-Pigeon	<i>Treron bicinctus</i>	Columbidae	Migrant
39	Yellow-footed Green-Pigeon	<i>Treron phoenicopterus</i>	Columbidae	Resident
Sandgrouse				
40	Chestnut-bellied Sandgrouse	<i>Pterocles exustus</i>	Pteroclidae	Resident

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident
	Cuckoos			
41	Greater Coucal	<i>Centropus sinensis</i>	Cuculidae	Resident
42	Pied Cuckoo (Jacobin Cuckoo)	<i>Clamator jacobinus</i>	Cuculidae	Migrant
43	Asian Koel	<i>Eudynamys scolopaceus</i>	Cuculidae	Resident
44	Grey-bellied Cuckoo	<i>Cacomantis passerinus</i>	Cuculidae	Migrant
45	Common Hawk-Cuckoo	<i>Hierococcyx varius</i>	Cuculidae	Resident
46	Common Cuckoo	<i>Cuculus canorus</i>	Cuculidae	Migrant
Nightjars				
47	Savanna Nightjar	<i>Caprimulgus affinis</i>	Caprimulgidae	Migrant
Swifts				
48	Alpine Swift	<i>Apus melba</i>	Apodidae	Migrant
49	Little Swift (Indian House Swift)	<i>Apus affinis</i>	Apodidae	Resident
50	Asian Palm Swift	<i>Cypsiurus balasiensis</i>	Apodidae	Resident
Rails, Gallinules, and Allies				
51	Eurasian Moorhen	<i>Gallinula chloropus</i>	Rallidae	Resident
52	Eurasian Coot	<i>Fulica atra</i>	Rallidae	Resident
53	Grey-headed Swamphen (Purple Swamphen)	<i>Porphyrio poliocephalus</i>	Rallidae	Resident
54	Watercock	<i>Gallicrex cinerea</i>	Rallidae	Migrant
55	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	Rallidae	Resident
56	Ruddy-breasted Crake	<i>Zapornia fusca</i>	Rallidae	Migrant
57	Brown Crake	<i>Zapornia akool</i>	Rallidae	Resident
58	Baillon's Crake	<i>Zapornia pusilla</i>	Rallidae	Migrant
Cranes				
59	Demoiselle Crane	<i>Anthropoides virgo</i>	Gruidae	Migrant
60	Sarus Crane	<i>Antigone antigone</i>	Gruidae	Resident
61	Common Crane	<i>Grus grus</i>	Gruidae	Migrant
Shorebirds				
62	Indian Thick-knee (Indian Stone-curlew)	<i>Burhinus indicus</i>	Burhinidae	Resident
63	Black-winged Stilt	<i>Himantopus himantopus</i>	Recurvirostridae	Resident
64	Pied Avocet	<i>Recurvirostra avosetta</i>	Recurvirostridae	Migrant
65	Black-bellied Plover (Grey Plover)	<i>Pluvialis squatarola</i>	Charadriidae	Migrant
66	Pacific Golden-Plover	<i>Pluvialis fulva</i>	Charadriidae	Migrant
67	Northern Lapwing	<i>Vanellus vanellus</i>	Charadriidae	Migrant
68	River Lapwing	<i>Vanellus duvaucelii</i>	Charadriidae	Resident
69	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>	Charadriidae	Resident
70	Grey-headed Lapwing	<i>Vanellus cinereus</i>	Charadriidae	Migrant
71	Red-wattled Lapwing	<i>Vanellus indicus</i>	Charadriidae	Resident
72	White-tailed Lapwing	<i>Vanellus leucurus</i>	Charadriidae	Migrant
73	Lesser Sand-Plover	<i>Charadrius mongolus</i>	Charadriidae	Migrant
74	Kentish Plover	<i>Charadrius alexandrinus</i>	Charadriidae	Migrant
75	Common Ringed Plover	<i>Charadrius hiaticula</i>	Charadriidae	Migrant
76	Little Ringed Plover	<i>Charadrius dubius</i>	Charadriidae	Resident
77	Greater Painted-Snipe	<i>Rostratula benghalensis</i>	Rostratulidae	Resident
78	Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	Jacanidae	Resident
79	Bronze-winged Jacana	<i>Metopidius indicus</i>	Jacanidae	Resident

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident
80	Eurasian Curlew	<i>Numenius arquata</i>	Scolopacidae	Migrant
81	Black-tailed Godwit	<i>Limosa limosa</i>	Scolopacidae	Migrant
82	Ruff	<i>Calidris pugnax</i>	Scolopacidae	Migrant
83	Curlew Sandpiper	<i>Calidris ferruginea</i>	Scolopacidae	Migrant
84	Temminck's Stint	<i>Calidris temminckii</i>	Scolopacidae	Migrant
85	Dunlin	<i>Calidris alpina</i>	Scolopacidae	Migrant
86	Little Stint	<i>Calidris minuta</i>	Scolopacidae	Migrant
87	Jack Snipe	<i>Lymnocryptes minimus</i>	Scolopacidae	Migrant
88	Common Snipe	<i>Gallinago gallinago</i>	Scolopacidae	Migrant
89	Common Sandpiper	<i>Actitis hypoleucos</i>	Scolopacidae	Migrant
90	Green Sandpiper	<i>Tringa ochropus</i>	Scolopacidae	Migrant
91	Spotted Redshank	<i>Tringa erythropus</i>	Scolopacidae	Migrant
92	Common Greenshank	<i>Tringa nebularia</i>	Scolopacidae	Migrant
93	Marsh Sandpiper	<i>Tringa stagnatilis</i>	Scolopacidae	Migrant
94	Wood Sandpiper	<i>Tringa glareola</i>	Scolopacidae	Migrant
95	Common Redshank	<i>Tringa totanus</i>	Scolopacidae	Migrant
96	Barred Buttonquail	<i>Turnix suscitator</i>	Turnicidae	Resident
97	Oriental Pratincole	<i>Glareola maldivarum</i>	Glareolidae	Migrant
98	Small Pratincole	<i>Glareola lactea</i>	Glareolidae	Resident
Gulls, Terns, and Skimmers				
99	Slender-billed Gull	<i>Chroicocephalus genei</i>	Laridae	Migrant
100	Black-headed Gull	<i>Chroicocephalus ridibundus</i>	Laridae	Migrant
101	Brown-headed Gull	<i>Chroicocephalus brunnicephalus</i>	Laridae	Migrant
102	Little Gull	<i>Hydrocoloeus minutus</i>	Laridae	Migrant
103	Pallas's Gull	<i>Ichthyaetus ichthyaetus</i>	Laridae	Migrant
104	Caspian Gull	<i>Larus cachinnans</i>	Laridae	Migrant
105	Lesser Black-backed Gull	<i>Larus fuscus</i>	Laridae	Migrant
106	Little Tern	<i>Sternula albifrons</i>	Laridae	Migrant
107	Gull-billed Tern	<i>Gelochelidon nilotica</i>	Laridae	Migrant
108	White-winged Tern	<i>Chlidonias leucopterus</i>	Laridae	Migrant
109	Whiskered Tern	<i>Chlidonias hybrida</i>	Laridae	Migrant
110	Black-bellied Tern	<i>Sterna acuticauda</i>	Laridae	Resident
111	River Tern	<i>Sterna aurantia</i>	Laridae	Resident
112	Indian Skimmer	<i>Rynchops albicollis</i>	Laridae	Resident
Storks				
113	Asian Openbill	<i>Anastomus oscitans</i>	Ciconiidae	Resident
114	Black Stork	<i>Ciconia nigra</i>	Ciconiidae	Migrant
115	Asian Woolly-necked Stork	<i>Ciconia episcopus</i>	Ciconiidae	Resident
116	White Stork	<i>Ciconia ciconia</i>	Ciconiidae	Migrant
117	Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	Ciconiidae	Resident
118	Painted Stork	<i>Mycteria leucocephala</i>	Ciconiidae	Resident
Cormorants and Anhingas				
119	Oriental Darter	<i>Anhinga melanogaster</i>	Anhingidae	Resident
120	Little Cormorant	<i>Microcarbo niger</i>	Phalacrocoracidae	Resident
121	Great Cormorant	<i>Phalacrocorax carbo</i>	Phalacrocoracidae	Resident
122	Indian Cormorant (Indian Shag)	<i>Phalacrocorax fuscicollis</i>	Phalacrocoracidae	Resident

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Pelicans				
123	Great White Pelican (Rosy Pelican)	<i>Pelecanus onocrotalus</i>	Pelecanidae	Migrant
Herons, Ibis, and Allies				
124	Great Bittern	<i>Botaurus stellaris</i>	Ardeidae	Migrant
125	Yellow Bittern	<i>Ixobrychus sinensis</i>	Ardeidae	Migrant
126	Little Bittern	<i>Ixobrychus minutus</i>	Ardeidae	Migrant
127	Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	Ardeidae	Migrant
128	Black Bittern	<i>Ixobrychus flavicollis</i>	Ardeidae	Migrant
129	Grey Heron	<i>Ardea cinerea</i>	Ardeidae	Resident
130	Purple Heron	<i>Ardea purpurea</i>	Ardeidae	Resident
131	Great Egret	<i>Ardea alba</i>	Ardeidae	Resident
132	Intermediate Egret	<i>Ardea intermedia</i>	Ardeidae	Resident
133	Little Egret	<i>Egretta garzetta</i>	Ardeidae	Resident
134	Cattle Egret	<i>Bubulcus ibis</i>	Ardeidae	Resident
135	Indian Pond-Heron	<i>Ardeola grayii</i>	Ardeidae	Resident
136	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Ardeidae	Resident
137	Striated Heron (Little Heron)	<i>Butorides striata</i>	Ardeidae	Resident
138	Glossy Ibis	<i>Plegadis falcinellus</i>	Threskiornithidae	Resident
139	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	Threskiornithidae	Resident
140	Red-naped Ibis (Indian Black Ibis)	<i>Pseudibis papillosa</i>	Threskiornithidae	Resident
141	Eurasian Spoonbill	<i>Platalea leucorodia</i>	Threskiornithidae	Migrant
Vultures, Hawks, and Allies				
142	Osprey	<i>Pandion haliaetus</i>	Pandionidae	Migrant
143	Black-winged Kite (Black-shouldered Kite)	<i>Elanus caeruleus</i>	Accipitridae	Resident
144	Egyptian Vulture	<i>Neophron percnopterus</i>	Accipitridae	Resident
145	Oriental Honey-buzzard (Crested Honey Buzzard)	<i>Pernis ptilorhynchus</i>	Accipitridae	Resident
146	Red-headed Vulture	<i>Sarcogyps calvus</i>	Accipitridae	Migrant
147	White-backed Vulture	<i>Gyps africanus</i>	Accipitridae	Migrant
148	White-rumped Vulture	<i>Gyps bengalensis</i>	Accipitridae	Migrant
149	Indian Vulture (Indian Long-billed Vulture)	<i>Gyps indicus</i>	Accipitridae	Migrant
150	Himalayan Griffon (Himalayan Vulture)	<i>Gyps himalayensis</i>	Accipitridae	Migrant
151	Eurasian Griffon (Griffon Vulture)	<i>Gyps fulvus</i>	Accipitridae	Migrant
152	Crested Serpent-Eagle	<i>Spilornis cheela</i>	Accipitridae	Migrant
153	Short-toed Snake-Eagle	<i>Circaetus gallicus</i>	Accipitridae	Resident
154	Indian Spotted Eagle	<i>Clanga hastata</i>	Accipitridae	Resident
155	Greater Spotted Eagle	<i>Clanga clanga</i>	Accipitridae	Migrant
156	Booted Eagle	<i>Hieraetus pennatus</i>	Accipitridae	Migrant
157	Steppe Eagle	<i>Aquila nipalensis</i>	Accipitridae	Migrant
158	Imperial Eagle	<i>Aquila heliaca</i>	Accipitridae	Migrant
159	Bonelli's Eagle	<i>Aquila fasciata</i>	Accipitridae	Resident
160	White-eyed Buzzard	<i>Butastur teesa</i>	Accipitridae	Migrant
161	Eurasian Marsh-Harrier	<i>Circus aeruginosus</i>	Accipitridae	Migrant
162	Pallid Harrier	<i>Circus macrourus</i>	Accipitridae	Migrant
163	Shikra	<i>Accipiter badius</i>	Accipitridae	Resident
164	Eurasian Sparrowhawk	<i>Accipiter nisus</i>	Accipitridae	Migrant

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165	Black Kite	<i>Milvus migrans</i>	Accipitridae	Resident
166	Brahminy Kite	<i>Haliastur indus</i>	Accipitridae	Migrant
167	White-tailed Eagle	<i>Haliaeetus albicilla</i>	Accipitridae	Migrant
168	Lesser Fish-Eagle	<i>Haliaeetus humilis</i>	Accipitridae	Migrant
170	Common Buzzard	<i>Buteo buteo</i>	Accipitridae	Migrant
171	Long-legged Buzzard	<i>Buteo rufinus</i>	Accipitridae	Migrant
Owls				
172	Barn Owl	<i>Tyto alba</i>	Tytonidae	Resident
173	Indian Scops-Owl (Collared Scops-Owl)	<i>Otus bakkamoena</i>	Strigidae	Resident
174	Pallid Scops-Owl	<i>Otus brucei</i>	Strigidae	Migrant
175	Spotted Owlet	<i>Athene brama</i>	Strigidae	Resident
176	Short-eared Owl	<i>Asio flammeus</i>	Strigidae	Migrant
Hoopoes				
177	Eurasian Hoopoe	<i>Upupa epops</i>	Upupidae	Resident
Hornbills				
178	Indian Grey Hornbill	<i>Ocyceros birostris</i>	Bucerotidae	Resident
179	Oriental Pied-Hornbill	<i>Anthracoceros albirostris</i>	Bucerotidae	Migrant
180	Common Kingfisher (Small Blue Kingfisher)	<i>Alcedo atthis</i>	Alcedinidae	Migrant
181	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	Alcedinidae	Resident
182	Pied Kingfisher	<i>Ceryle rudis</i>	Alcedinidae	Resident
Bee-eaters, Rollers, and Allies				
183	Asian Green Bee-eater	<i>Merops orientalis</i>	Meropidae	Resident
184	Blue-cheeked Bee-eater	<i>Merops persicus</i>	Meropidae	Migrant
185	Blue-tailed Bee-eater	<i>Merops philippinus</i>	Meropidae	Migrant
186	Chestnut-headed Bee-eater	<i>Merops leschenaulti</i>	Meropidae	Migrant
187	European Roller	<i>Coracias garrulus</i>	Coraciidae	Migrant
188	Indian Roller	<i>Coracias benghalensis</i>	Coraciidae	Resident
Barbets and Toucans				
189	Coppersmith Barbet	<i>Psilopogon haemacephalus</i>	Megalaimidae	Resident
190	Brown-headed Barbet (Large Green Barbet)	<i>Psilopogon zeylanicus</i>	Megalaimidae	Resident
Woodpeckers				
191	Eurasian Wryneck	<i>Jynx torquilla</i>	Picidae	Migrant
192	Yellow-crowned Woodpecker	<i>Leiopicus mahrattensis</i>	Picidae	Resident
193	White-naped Woodpecker	<i>Chrysocolaptes festivus</i>	Picidae	Migrant
194	Black-rumped Flameback (Lesser Goldenbacked Woodpecker)	<i>Dinopium benghalense</i>	Picidae	Resident
Falcons and Caracaras				
195	Eurasian Kestrel (Common Kestrel)	<i>Falco tinnunculus</i>	Falconidae	Migrant
196	Red-necked Falcon	<i>Falco chicquera</i>	Falconidae	Resident
197	Eurasian Hobby	<i>Falco subbuteo</i>	Falconidae	Migrant
198	Laggar Falcon	<i>Falco jugger</i>	Falconidae	Resident
199	Peregrine Falcon	<i>Falco peregrinus</i>	Falconidae	Migrant
Parrots, Parakeets, and Allies				
200	Alexandrine Parakeet	<i>Psittacula eupatria</i>	Psittacidae	Resident
201	Rose-ringed Parakeet	<i>Psittacula krameri</i>	Psittacidae	Resident

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202	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	Psittacidae	Resident
203	Budgerigar	<i>Melopsittacus undulatus</i>	Psittacidae	Pet escapee
Cuckooshrikes				
204	Small Minivet	<i>Pericrocotus cinnamomeus</i>	Campephagidae	Resident
205	Long-tailed Minivet	<i>Pericrocotus ethologus</i>	Campephagidae	Migrant
206	Large Cuckooshrike	<i>Coracina macei</i>	Campephagidae	Resident
Old World Orioles				
207	Indian Golden Oriole	<i>Oriolus kundoo</i>	Oriolidae	Resident
208	Black-hooded Oriole	<i>Oriolus xanthornus</i>	Oriolidae	Migrant
Vangas, Helmetshrikes, and Allies				
209	Common Woodshrike	<i>Tephrodornis pondicerianus</i>	Vangidae	Resident
Fantails				
210	White-browed Fantail	<i>Rhipidura aureola</i>	Rhipiduridae	Resident
Drongos				
211	Black Drongo	<i>Dicrurus macrocercus</i>	Dicruridae	Resident
212	Ashy Drongo	<i>Dicrurus leucophaeus</i>	Dicruridae	Migrant
213	White-bellied Drongo	<i>Dicrurus caerulescens</i>	Dicruridae	Resident
214	Hair-crested Drongo (Spangled Drongo)	<i>Dicrurus hottentottus</i>	Dicruridae	Migrant
Monarch Flycatchers				
215	Indian Paradise-Flycatcher	<i>Terpsiphone paradisi</i>	Monarchidae	Migrant
Shrikes				
216	Isabelline Shrike	<i>Lanius isabellinus</i>	Laniidae	Migrant
217	Brown Shrike	<i>Lanius cristatus</i>	Laniidae	Migrant
218	Bay-backed Shrike	<i>Lanius vittatus</i>	Laniidae	Resident
219	Long-tailed Shrike	<i>Lanius schach</i>	Laniidae	Resident
Jays, Magpies, Crows, and Ravens				
221	Rufous Treepie	<i>Dendrocitta vagabunda</i>	Corvidae	Resident
222	House Crow	<i>Corvus splendens</i>	Corvidae	Resident
223	Large-billed Crow	<i>Corvus macrorhynchos</i>	Corvidae	Resident
Fairy Flycatchers				
224	Grey-headed Canary-Flycatcher	<i>Culicicapa ceylonensis</i>	Stenostiridae	Migrant
Tits, Chickadees, and Titmice				
225	Cinereous Tit (Great Tit)	<i>Parus cinereus</i>	Paridae	Resident
Penduline-Tits and Verdin				
226	White-crowned Penduline-Tit	<i>Remiz coronatus</i>	Remizidae	Migrant
Larks				
227	Ashy-crowned Sparrow-Lark (Ashy-crowned Finch-Lark)	<i>Eremopterix griseus</i>	Alaudidae	Resident
228	Bengal Bushlark	<i>Mirafra assamica</i>	Alaudidae	Resident
229	Indian Bushlark (Red-winged Bushlark)	<i>Mirafra erythroptera</i>	Alaudidae	Resident
230	Greater Short-toed Lark	<i>Calandrella brachydactyla</i>	Alaudidae	Migrant
231	Bimaculated Lark	<i>Melanocorypha bimaculata</i>	Alaudidae	Migrant
232	Sand Lark	<i>Alaudala raytal</i>	Alaudidae	Resident
233	Oriental Skylark	<i>Alauda gulgula</i>	Alaudidae	Resident
234	Crested Lark	<i>Galerida cristata</i>	Alaudidae	Resident
235	Hume's Lark (Hume's Short-toed Lark)	<i>Calandrella acutirostris</i>	Alaudidae	Migrant

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Cisticolas and Allies				
236	Common Tailorbird	<i>Orthotomus sutorius</i>	Cisticolidae	Resident
237	Rufous-fronted Prinia	<i>Prinia burchanami</i>	Cisticolidae	Resident
238	Grey-breasted Prinia	<i>Prinia hodgsonii</i>	Cisticolidae	Resident
239	Delicate Prinia (Indian Graceful Prinia)	<i>Prinia lepida</i>	Cisticolidae	Resident
240	Jungle Prinia	<i>Prinia sylvatica</i>	Cisticolidae	Resident
241	Yellow-bellied Prinia	<i>Prinia flaviventris</i>	Cisticolidae	Resident
242	Ashy Prinia	<i>Prinia socialis</i>	Cisticolidae	Resident
243	Plain Prinia	<i>Prinia inornata</i>	Cisticolidae	Resident
244	Zitting Cisticola	<i>Cisticola juncidis</i>	Cisticolidae	Resident
Reed Warblers and Allies				
245	Booted Warbler	<i>Iduna caligata</i>	Acrocephalidae	Migrant
246	Sykes's Warbler	<i>Iduna rama</i>	Acrocephalidae	Migrant
247	Moustached Warbler	<i>Acrocephalus melanopogon</i>	Acrocephalidae	Migrant
248	Paddyfield Warbler	<i>Acrocephalus agricola</i>	Acrocephalidae	Migrant
249	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	Acrocephalidae	Migrant
250	Clamorous Reed Warbler (Indian Great Reed Warbler)	<i>Acrocephalus stentoreus</i>	Acrocephalidae	Migrant
Grassbirds and Allies				
251	Striated Grassbird	<i>Cincloramphus palustris</i>	Locustellidae	Migrant
252	Bristled Grassbird	<i>Schoenicola striatus</i>	Locustellidae	Resident
Martins and Swallows				
253	Grey-throated Martin (Plain Martin)	<i>Riparia chinensis</i>	Hirundinidae	Resident
254	Bank Swallow (Sand Martin)	<i>Riparia riparia</i>	Hirundinidae	Migrant
255	Pale Sand Martin (Pale Martin)	<i>Riparia diluta</i>	Hirundinidae	Migrant
256	Dusky Crag-Martin	<i>Ptyonoprogne concolor</i>	Hirundinidae	Resident
257	Barn Swallow	<i>Hirundo rustica</i>	Hirundinidae	Migrant
258	Wire-tailed Swallow	<i>Hirundo smithii</i>	Hirundinidae	Resident
259	Red-rumped Swallow	<i>Cecropis daurica</i>	Hirundinidae	Resident
260	Streak-throated Swallow	<i>Petrochelidon fluvicola</i>	Hirundinidae	Resident
261	Common House-Martin (Northern House-Martin)	<i>Delichon urbicum</i>	Hirundinidae	Migrant
Bulbuls				
262	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Pycnonotidae	Resident
263	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	Pycnonotidae	Resident
264	White-eared Bulbul	<i>Pycnonotus leucotis</i>	Pycnonotidae	Resident
Leaf Warblers				
265	Hume's Warbler	<i>Phylloscopus humei</i>	Phylloscopidae	Migrant
266	Brooks's Leaf Warbler	<i>Phylloscopus subviridis</i>	Phylloscopidae	Migrant
267	Sulphur-bellied Warbler	<i>Phylloscopus griseolus</i>	Phylloscopidae	Migrant
268	Tickell's Leaf Warbler	<i>Phylloscopus affinis</i>	Phylloscopidae	Migrant
269	Dusky Warbler	<i>Phylloscopus fuscatus</i>	Phylloscopidae	Migrant
270	Common Chiffchaff	<i>Phylloscopus collybita</i>	Phylloscopidae	Migrant
271	Green Warbler	<i>Phylloscopus nitidus</i>	Phylloscopidae	Migrant
272	Greenish Warbler	<i>Phylloscopus trochiloides</i>	Phylloscopidae	Migrant
273	Western Crowned Warbler	<i>Phylloscopus occipitalis</i>	Phylloscopidae	Migrant

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Bush Warblers and Allies				
274	Cetti's Warbler	<i>Cettia cetti</i>	Cettiidae	Migrant
Sylviid Warblers				
275	Lesser Whitethroat	<i>Curruca curruca</i>	Sylviidae	Migrant
276	Eastern Orphean Warbler	<i>Curruca crassirostris</i>	Sylviidae	Migrant
Parrotbills, Wrentit, and Allies				
277	Yellow-eyed Babbler	<i>Chrysomma sinense</i>	Paradoxornithidae	Resident
White-eyes, Yuhinas, and Allies				
278	Indian White-eye (Oriental White-eye)	<i>Zosterops palpebrosus</i>	Zosteropidae	Resident
Laughing Thrushes and Allies				
279	Large Grey Babbler	<i>Argya malcolmi</i>	Leiothrichidae	Resident
280	Jungle Babbler	<i>Argya striata</i>	Leiothrichidae	Resident
281	Common Babbler	<i>Argya caudata</i>	Leiothrichidae	Resident
282	Striated Babbler	<i>Argya earlei</i>	Leiothrichidae	Resident
Starlings and Mynas				
283	European Starling (Common Starling)	<i>Sturnus vulgaris</i>	Sturnidae	Migrant
284	Rosy Starling	<i>Pastor roseus</i>	Sturnidae	Migrant
285	Indian Pied Starling (Pied Myna)	<i>Gracupica contra</i>	Sturnidae	Resident
286	Brahminy Starling	<i>Sturnia pagodarum</i>	Sturnidae	Resident
287	Chestnut-tailed Starling	<i>Sturnia malabarica</i>	Sturnidae	Resident
288	Common Myna	<i>Acridotheres tristis</i>	Sturnidae	Resident
289	Bank Myna	<i>Acridotheres ginginianus</i>	Sturnidae	Resident
Thrushes				
290	Orange-headed Thrush	<i>Geokichla citrina</i>	Turdidae	Migrant
291	Grey-winged Blackbird	<i>Turdus boulboul</i>	Turdidae	Migrant
292	Tickell's Thrush	<i>Turdus unicolor</i>	Turdidae	Migrant
293	Black-throated Thrush	<i>Turdus atrogularis</i>	Turdidae	Migrant
294	Dusky Thrush	<i>Turdus eunomus</i>	Turdidae	Migrant
Old World Flycatchers				
295	Asian Brown Flycatcher	<i>Muscicapa dauurica</i>	Muscicapidae	Migrant
296	Indian Robin	<i>Copsychus fulicatus</i>	Muscicapidae	Resident
297	Oriental Magpie-Robin	<i>Copsychus saularis</i>	Muscicapidae	Resident
298	Verditer Flycatcher	<i>Eumyias thalassinus</i>	Muscicapidae	Migrant
299	Bluethroat	<i>Luscinia svecica</i>	Muscicapidae	Migrant
300	Ultramarine Flycatcher	<i>Ficedula superciliaris</i>	Muscicapidae	Migrant
301	Taiga Flycatcher (Red-throated Flycatcher)	<i>Ficedula albicilla</i>	Muscicapidae	Migrant
302	Red-breasted Flycatcher	<i>Ficedula parva</i>	Muscicapidae	Migrant
303	Black Redstart	<i>Phoenicurus ochruros</i>	Muscicapidae	Migrant
304	Blue-capped Rock-Thrush	<i>Monticola cinclorhyncha</i>	Muscicapidae	Migrant
305	Blue Rock-Thrush	<i>Monticola solitarius</i>	Muscicapidae	Migrant
306	Siberian Stonechat (Common Stonechat)	<i>Saxicola maurus</i>	Muscicapidae	Migrant
307	White-tailed Stonechat	<i>Saxicola leucurus</i>	Muscicapidae	Migrant
308	Pied Bushchat	<i>Saxicola caprata</i>	Muscicapidae	Resident
309	Grey Bushchat	<i>Saxicola ferreus</i>	Muscicapidae	Migrant
310	Desert Wheatear	<i>Oenanthe deserti</i>	Muscicapidae	Migrant
311	Brown Rock Chat (Indian Chat)	<i>Oenanthe fusca</i>	Muscicapidae	Resident

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident
312	Variable Wheatear	<i>Oenanthe picata</i>	Muscicapidae	Migrant
Sunbirds and Spiderhunters				
313	Purple Sunbird	<i>Cinnyris asiaticus</i>	Nectariniidae	Resident
Weavers and Allies				
314	Streaked Weaver	<i>Ploceus manyar</i>	Ploceidae	Resident
315	Baya Weaver	<i>Ploceus philippinus</i>	Ploceidae	Resident
316	Black-breasted Weaver (Bengal Weaver)	<i>Ploceus benghalensis</i>	Ploceidae	Resident
Estrildids				
317	Indian Silverbill (White-throated Munia)	<i>Euodice malabarica</i>	Estrildidae	Resident
318	Scaly-breasted Munia (Spotted Munia)	<i>Lonchura punctulata</i>	Estrildidae	Resident
319	Tricolored Munia (Black-headed Munia)	<i>Lonchura malacca</i>	Estrildidae	Resident
320	Chestnut Munia	<i>Lonchura atricapilla</i>	Estrildidae	Migrant
321	Red Avadavat	<i>Amandava amandava</i>	Estrildidae	Resident
Old World Sparrows				
322	House Sparrow	<i>Passer domesticus</i>	Passeridae	Resident
323	Spanish Sparrow	<i>Passer hispaniolensis</i>	Passeridae	Migrant
324	Yellow-throated Sparrow (Chestnut-shouldered Petronia)	<i>Gymnoris xanthocollis</i>	Passeridae	Resident
Wagtails and Pipits				
325	Forest Wagtail	<i>Dendronanthus indicus</i>	Motacillidae	Migrant
326	Grey Wagtail	<i>Motacilla cinerea</i>	Motacillidae	Migrant
327	Western Yellow Wagtail	<i>Motacilla flava</i>	Motacillidae	Migrant
328	Citrine Wagtail	<i>Motacilla citreola</i>	Motacillidae	Migrant
329	White-browed Wagtail (Large Pied Wagtail)	<i>Motacilla maderaspatensis</i>	Motacillidae	Resident
330	White Wagtail	<i>Motacilla alba</i>	Motacillidae	Migrant
331	Richard's Pipit	<i>Anthus richardi</i>	Motacillidae	Migrant
332	Paddyfield Pipit	<i>Anthus rufulus</i>	Motacillidae	Resident
333	Long-billed Pipit	<i>Anthus similis</i>	Motacillidae	Migrant
334	Tawny Pipit	<i>Anthus campestris</i>	Motacillidae	Migrant
335	Rosy Pipit	<i>Anthus roseatus</i>	Motacillidae	Migrant
336	Tree Pipit	<i>Anthus trivialis</i>	Motacillidae	Migrant
337	Olive-backed Pipit	<i>Anthus hodgsoni</i>	Motacillidae	Migrant
338	Red-throated Pipit	<i>Anthus cervinus</i>	Motacillidae	Migrant
339	Water Pipit	<i>Anthus spinoletta</i>	Motacillidae	Migrant
Finches, Euphonias, and Allies				
340	Common Rosefinch	<i>Carpodacus erythrinus</i>	Fringillidae	Migrant
Old World Buntings				
341	Crested Bunting	<i>Emberiza lathami</i>	Emberizidae	Migrant
342	Black-headed Bunting	<i>Emberiza melanocephala</i>	Emberizidae	Migrant
343	Red-headed Bunting	<i>Emberiza bruniceps</i>	Emberizidae	Migrant
344	White-capped Bunting (Chestnut-breasted Bunting)	<i>Emberiza stewarti</i>	Emberizidae	Migrant
345	Grey-necked Bunting (Grey-hooded Bunting)	<i>Emberiza buchanani</i>	Emberizidae	Migrant
Flowerpeckers				
346	Thick-billed Flowerpecker	<i>Dicaeum agile</i>	Dicaeidae	Migrant

Table 9: List of Amphibians

Sl. No.	Common Name	Scientific Name	Family
1	Common Toad	<i>Bufo melanostictus</i>	Bufonidae
2	Green Pond Frog	<i>Euphlyctishex adactylus</i>	Dicroglossidae
3	Indian Bull Frog	<i>Hoplobatrachus tigerinus</i>	Dicroglossidae
4	Marbled Toad	<i>Bufo maticus</i>	Bufonidae
5	Skittering Frog	<i>Euphlyctis cynoaphylctis</i>	Dicroglossidae







8.2. National Biodiversity Action Plan (NBAP)





NATIONAL BIODIVERSITY ACTION PLAN (NBAP)



ADDENDUM
2014
TO NBAP
2008



Ministry of Environment,
Forests & Climate Change
Government of India

NATIONAL
BIODIVERSITY
ACTION
PLAN (NBAP)

**ADDENDUM 2014
TO NBAP 2008**



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Government of India, 2014

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FOREWORD



India is a megadiverse country that harbours 7-8% of all recorded species, including over 45,000 species of plants and 91,000 species of animals, on only 2.4% of the world's land area. Biodiversity forms the cornerstone of ecosystem functions and services that support millions of livelihoods in the country. India has been persevering in its efforts to conserve this vital biodiversity and ecosystems. As a Party to the Convention on Biological Diversity (CBD) that mandates parties to prepare a national biodiversity strategy and action plan for implementing the Convention at the national level, India developed a National Policy and Macrolevel Action Strategy on Biodiversity in 1999. Subsequent to the adoption of the National Environment Policy (NEP) in 2006, a National Biodiversity Action Plan (NBAP) was developed through a comprehensive inter-ministerial process in 2008. India's NBAP is broadly aligned to the global Strategic Plan for Biodiversity 2011-2020 adopted under the aegis of CBD in 2010. Using the Strategic Plan as a framework, India has now developed 12 National Biodiversity Targets through extensive stakeholder consultations and public outreach. I am pleased to note that India is among the select countries that have now developed their own National Biodiversity Targets, which now form an Addendum to the NBAP 2008. This document together with the NBAP 2008 forms the blueprint for biodiversity conservation in the country.

Implementing the NBAP will be a challenging task and calls for active involvement of several other Ministries. Stewardship at the highest level of governance will be a key ingredient to success. People's participation will remain central to its successful implementation with active support at the individual level of citizens throughout the country.

I congratulate all those who were involved in this task which has been undertaken with support from a Global Environment Facility project implemented by the National Biodiversity Authority (NBA). I wish to place on the record my deep appreciation for the overall supervision provided by Dr R. Rajagopalan, Secretary, the guidance and support of Shri Hem Pande, Additional Secretary and Chairman, NBA, and the diligent efforts put in by Dr Sujata Arora, Director, Ministry of Environment, Forests, & Climate Change, in this endeavor. I also appreciate the efforts put in by Dr V.B. Mathur, Director, Wildlife Institute of India (WII) and his project team in preparing this document during India's Presidency of the eleventh Conference of the Parties to the CBD.

(Prakash Javadekar)

Minister of State (Independent Charge)
Environment, Forests and Climate Change
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This exercise would have been incomplete if the funds allocated to States and Union Territories for biodiversity conservation was not looked into. We thank the Planning Commission for providing us detailed information regarding the funds allocated for the States and Union Territories for activities related to biodiversity conservation.

We are also grateful to all the State Biodiversity Boards who have participated with great enthusiasm in all the national stakeholder consultations and contributed by providing relevant information and suggestions.

The NBAP team

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LIST OF ABBREVIATIONS

ASEAN	Association of Southeast Asian Network
AYUSH	Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy
BHS	Biodiversity Heritage Site
BMCs	Biodiversity Management Committees
BNHS	Bombay Natural History Society
BSI	Botanical Survey of India
CAs	Chartered Accountants
CBD	Convention on Biological Diversity
CEE	Centre for Environment Education
CMFRI	Central Marine Fisheries Research Institute
CMLRE	Centre For Marine Living Resources & Ecology
CMS	Centre for Media Studies
CoP	Conference of Parties
CPCB	Central Pollution Control Board
CPREEC	C.P.R. Environmental Education Centre
CSIR	Council for Scientific and Industrial Research
DNA	Deoxyribonucleic Acid
DoS	Department of Space
EIA	Environment Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
FRA	Forest Right Act
FRCs	Forest Right Committees
FRI	Forest Research Institute
FSI	Forest Survey of India / Fishery Survey of India
GEF	Global Environment Facility
GIM	Green India Mission
GoI	Government of India
GSPC	Global Strategy for Plant Protection
IBAs	Important Bird Areas
ICAR	Indian Council of Agriculture Research
ICFRE	Indian Council of Forest Research and Education
IEG	Institute for Economic Growth
IGIDR	Indira Gandhi Institute for Development Research
IIFM	Indian Institute of Forest Management
IUCN	International Union for Conservation of Nature
JFM	Joint Forest Management

JFMCs	Joint Forest Management Committees
LMOs	Living Modified Organism
MDF	Moderately Dense Forests
MDGs	Millennium Development Goals
MLAs	Member of Legislative Assembly
MoA	Ministry of Agriculture
MoC	Ministry of Coal
MoCF	Ministry of Chemical and Fertilizers
MoCI	Ministry of Commerce and Industry
MoCIT	Ministry of Communications and Information Technology
MoDWS	Ministry of Drinking Water and Sanitation
MoEF/ MoEFCC	Ministry of Environment and Forests/ Ministry of Environment, Forests & Climate Change
MoES	Ministry of Earth Science
MoHFW	Ministry of Health and Family Welfare
MoHRD	Ministry of Human Resources Department
MoNRE	Ministry of New and Renewable Energy
MoP	Ministry of Power
MoPNG	Ministry of Petroleum and Natural Gas
MoPR	Ministry of Panchayati Raj
MoRD	Ministry of Rural Development
MoS	Ministry of Shipping
MoSPI	Ministry of Statistics and Programme Implementation
MoST	Ministry of Science and Technology
MoT	Ministry of Tourism
MoTA	Ministry of Tribal Affairs
MoUD	Ministry of Urban Development
MoWR	Ministry of Water Resources
MoYAS	Ministry of Youth Affairs and Sports
MPs	Member of Parliament
NBA	National Biodiversity Authority
NBAGR	National Bureau of Animal Genetic Resources
NBAII	National Bureau of Agriculturally Important Insects
NBAIM	National Bureau of Agriculturally Important Microorganisms
NBAP	National Biodiversity Action Plan
NBFGR	National Bureau of Fish Genetic Resources
NBPGR	National Bureau of Plant Genetic Resources

NBSAP	National Biodiversity Strategic and Action Plan
NBSS&LUP	National Bureau of Soil Survey and Land Use Planning
NBTs	National Biodiversity Targets
NEP	National Environment Policy
NFDB	National Forest Development Board
NGO	Non-Government Organization
NMPB	National Medicinal Plant Board
NR5	Fifth National Report
NTFPs	Non Timber Forest Produce
OF	Open Forest
PA	Protected Area
PBR	People's Biodiversity Register
PoWPA	Programme of Work on Protected Areas
PRIs	Panchayati Raj Institutions
R&D	Research and Development
RFD	Result Framework Document
SAARC	South Asian Association for Regional Cooperation
SACON	Sálim Ali Centre for Ornithology and Natural History
SBAPs	State Biodiversity Action Plan
SBBs	State Biodiversity Boards
SFDs	State Forest Departments
SP	Strategic Plan for Biodiversity
SPCBs	State Pollution Control Boards
TK	Traditional Knowledge
TKDL	Traditional Knowledge Digital Library
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
UT	Union Territory
VDF	Very Dense Forest
VEDCs	Village Eco-development Committees
WII	Wildlife Institute of India
WWF	World- Wide Fund for Nature
ZSI	Zoological Survey of India
₹	Indian Rupee



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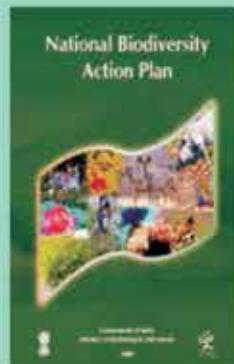
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BACKGROUND

NATIONAL BIODIVERSITY ACTION PLAN (NBAP)

India, a megadiverse country with only 2.4% of the world's land area, accounts for 7-8% of all recorded species, including over 45,000 species of plants and 91,000 species of animals. India's biodiversity underpins ecosystem functions and services that are of great human value. For millions of Indians, biodiversity supports their very livelihoods and ways of life.

The Convention on Biological Diversity (CBD) mandates each Party to prepare a National Biodiversity Strategy and Action Plan (NBSAP) or an equivalent instrument, and to ensure that this strategy is mainstreamed into relevant sectoral or cross-sectoral plans, programmes and policies. NBSAPs are the principal instruments for implementing the Convention at the national level. Accordingly, the Government of India developed a National Policy and Macrolevel Action Strategy on Biodiversity in 1999 (MoEF 1999) within five years of ratifying the CBD. This document, prepared through an extensive consultative process involving various stakeholders, is a macro-level statement of policies and strategies needed for conservation and sustainable use of biological diversity. Subsequently, the Ministry of Environment and Forests (MoEF) implemented an externally-aided project, the NBSAP, from 2000 to 2004. Following India's adoption of the National Environment Policy (NEP) in 2006, a National Biodiversity Action Plan (NBAP) was prepared by updating the 1999 document (MoEF 1999), and by using the final technical report of the NBSAP project, in order to achieve consonance between the NBAP and the NEP 2006. India's NBAP, formulated through a comprehensive interministerial process, was approved by Government of India (GoI) in 2008 (MoEF 2008, <http://nbaaindia.org/uploaded/Biodiversityindia/NBAP.pdf>). The NBAP draws from the principle in the NEP that human beings are at the centre of concerns for sustainable development and they are entitled to a healthy and productive life in harmony with nature. The NBAP-2008 identifies threats and constraints in biodiversity conservation taking into cognizance the existing legislations, implementation mechanisms, strategies, plans and programmes, based on which action points have been designed.



¹ The Ministry of Environment & Forests (MoEF) has been renamed as Ministry of Environment, Forest & Climate Change (MoEFCC) in June, 2014. The terms have been used interchangeably in the document.

ADDENDUM 2014
TO NBAP 2008

Even though the NBAP 2008 was prepared prior to the adoption of the Strategic Plan for Biodiversity (SP) 2011–2020 and its 20 Aichi Biodiversity Targets by the Conference of Parties (CoP) to the CBD in 2010 at Nagoya, Japan (Appendix 1), the NBAP is broadly aligned with the five Strategic Goals and the 20 Aichi Biodiversity Targets of SP. The CoP-10 to the CBD has urged Parties to develop national and regional targets, using SP and its targets as a flexible framework, in accordance with national priorities and capacities. Parties are also required to review, and as appropriate update and revise, their NBSAPs or equivalent instruments with the SP, by integrating their National Biodiversity Targets (NBTs) into their NBSAPs, and report thereon to CoP-12. Since India has prepared her second generation of NBAP in 2008, it was decided that the NBAP need not be completely overhauled or revised, but an exercise be undertaken of updating the NBAP by developing NBTs (Table 1), keeping in view the Aichi Biodiversity Targets as a framework. Accordingly, in pursuance to the decision of CoP-10, India has prepared 12 NBTs using the SP for Biodiversity 2011–2020 as the broad framework. These National Biodiversity Targets prepared through an extensive consultative process with all stakeholders, have also been included in India's Fifth National Report (NR5) to the CBD (MoEF 2014, <http://www.cbd.int/doc/world/in/in-nr-05-en.pdf>).



These 12 NBTs along with indicators and monitoring framework developed for these targets, are presented in this document, which is an Addendum to NBAP 2008. In addition, an exercise has been undertaken to highlight the synergies between NBAP 2008, 12 NBTs, Programme of Work on Protected Areas (PoWPA), and Global Strategy for Plant Conservation (GSPC). With a view to provide ready reference and continuity with NBAP 2008, the action points of India's NBAP 2008 along with action points of India's PoWPA have been reproduced in Sections 1.3 and 1.4, respectively.

BACKGROUND

02

PROCESS OF UPDATING NATIONAL BIODIVERSITY ACTION PLAN 2008

1.2

NATIONAL BIODIVERSITY ACTION PLAN (NBAP)

Considering the aforementioned need for updating the NBAP, 12 NBTs and associated indicators and monitoring framework (Table 1) that provide a road map for achieving the Aichi Biodiversity Targets have been developed. These NBTs are based on consultations with a range of stakeholders and a review of the programmes and activities being undertaken by Ministries/Departments in the GoI and by State Biodiversity Boards (SBBs). Icons for the NBTs have also been developed with a view to enhance their recall value and outreach (Table 1).

The process of preparing NBTs was initiated through a high level meeting with concerned Ministries/Departments in November 2011. This was followed by a series of inter-ministerial meetings and stakeholders consultations organized in April 2012 and July 2012. Thereafter, under the Global Environmental Facility (GEF) Direct Access project on 'Strengthening the Enabling Environment for Biodiversity Conservation and Management in India', consultations with stakeholders for preparation of NBS and updating of NBAP were continued. A National Stakeholder Consultation for discussing the contents of NBS and the proposed NBTs was held on 30 July 2013. Following further discussions, the revised draft was reviewed by a Technical Review Committee set up by MoEF for this purpose. The NBTs were identified based on an extensive review of Result Framework Documents (RFDs) of the 52 Ministries/Departments of the GoI, information available in annual reports/websites of Ministries/Departments and institutions, as well as discussions and written submissions provided by officials, scientists and other stakeholders at the individual level and a range of organizations in the country.

The NBTs were also discussed and communicated through an outreach and communication programme as part of the seventh CMS Vatavaran International Environment and Wildlife Film Festival and Forum, held between 30 January 2014 and 3 February 2014 at New Delhi, supported by the MoEF. Twelve sessions were conducted for each target over the period, wherein panel discussions and public outreach programmes were conducted to create awareness, deliberate upon and communicate to the public about the development of India's NBTs in harmony with the CBD's SP 2011–2020 and Aichi Biodiversity Targets.

While the 12 NBTs have been conceptualized now, the country has a long history of working for conservation of its unique biodiversity with multi-stakeholder participation. The fact that India harbours 7–8% of the world's known biological diversity in about 2.4% of the land area while supporting 18% of the human and 18% of the cattle population, is an eloquent testimony to her conservation ethos and commitment to conserving biodiversity and to realizing the vision of living in harmony with nature.



ACTION POINTS OF NATIONAL BIODIVERSITY ACTION PLAN 2008

1.3

ADDENDUM 2014
TO RBAP 2008

Strengthening and integration of *in situ*, on-farm and *ex situ* conservation

I

In situ conservation

1. Expand the Protected Area (PA) network of the country including Conservation and Community Reserves, to give fair representation to all biogeographic zones of the country. In doing so, develop norms for delineation of PAs in terms of the objectives and principles of the National Environment Policy. In particular, participation of local communities, concerned public agencies, and other stakeholders, who have direct and tangible stake in protection and conservation of wildlife, to harmonize ecological and physical features with needs of socio-economic development.
2. Establish self-sustaining monitoring system for overseeing the activities and effectiveness of the PA network.
3. Ensure that human activities on the fringe areas of PAs do not degrade the habitat or otherwise significantly disturb wildlife.
4. Mitigate man-animal conflicts.
5. Promote site-specific eco-development programmes in fringe areas of PAs, to restore livelihoods and access to forest produce by local communities, owing to access restrictions in PAs.
6. Promote voluntary relocation of villagers from critical habitats of PAs.
7. Devise effective management and conservation techniques for the forest preservation plots to ensure conservation of representative areas of different forest types.
8. Strengthen research work on PAs, biosphere reserves and fragile ecosystems by involving local research institutions and universities, so as to develop baseline data on biological and managerial parameters, and functional properties of ecosystems.
9. Strengthen the protection of areas of high endemism of genetic resources (biodiversity hotspots), while providing alternative livelihoods and access to resources to local communities who may be affected thereby.
10. Continue to promote inter-sectoral consultations and partnerships in strengthening biodiversity conservation activities.
11. Strengthen capacities and implement measures for captive breeding and release into the wild of identified endangered species.
12. Reintroduction and establishment of viable populations of threatened plant species.
13. Control poaching and illegal trade in wild animals and plant species.

ACTION POINTS OF NATIONAL
BIODIVERSITY ACTION PLAN 2008

04



14. Periodically revisit the norms, criteria and needs of data for placing particular species in different schedules of the Wildlife (Protection) Act.
15. Promote ecological and socially sensitive tourism and pilgrimage activities with emphasis on regulated and low impact tourism on a sustainable basis through adoption of best practice norms.
16. Formulate and implement partnerships for enhancement of wildlife habitat in Conservation Reserves and Community Reserves, on the lines of multi-stakeholder partnerships for afforestation, to derive both environmental and eco-tourism benefits.
17. Promote conservation of biodiversity outside the PA network, on private property, on common lands, water bodies and urban areas.
18. Formulate and implement programmes for conservation of endangered species outside PAs.
19. Ensure conservation of ecologically sensitive areas, which are prone to high risk of loss of biodiversity due to natural or anthropogenic factors.
20. Ensure that survey and bioprospecting of native economically important biological resources is undertaken on a priority basis.
21. Integrate conservation and wise use of wetlands and river basins involving all stakeholders, in particular local communities, to ensure maintenance of hydrological regimes and conservation of biodiversity.
22. Consider particular unique wetlands as entities of incomparable values, in developing strategies for their protection and formulate conservation and prudent use strategies for the identified wetlands with participation of local communities and other stakeholders.

On-farm conservation

23. Identify hotspots of agro-biodiversity under different agro-ecozones and cropping systems and promote on-farm conservation.
24. Provide economically feasible and socially acceptable incentives such as value addition and direct market access in the face of replacement by other economically remunerative cultivars.
25. Develop appropriate models for on-farm conservation of livestock herds maintained by different institutions and local communities.
26. Develop mutually supportive linkages between *in situ*, on-farm and *ex situ* conservation programmes.



Ex situ conservation

27. Promote *ex situ* conservation of rare, endangered, endemic and insufficiently known floristic and faunal components of natural habitats, through appropriate institutionalization and human resource capacity building. For example, pay immediate attention to conservation and multiplication of rare, endangered and endemic tree species through institutions such as Institute of Forest Genetics and Tree Breeding.
28. Focus on conservation of genetic diversity (*in situ, ex situ, in vitro*) of cultivated plants, domesticated animals and their wild relatives to support breeding programmes.
29. Strengthen national *ex situ* conservation system for crop and livestock diversity, including poultry, linking national gene banks, clonal repositories and field collections maintained by different research centres and universities.
30. Develop cost effective and situation specific technologies for medium and long term storage of seed samples collected by different institutions and organizations.
31. Undertake DNA profiling for assessment of genetic diversity in rare, endangered and endemic species to assist in developing their conservation programmes.
32. Develop a unified national database covering all *ex situ* conservation sites.
33. Consolidate, augment and strengthen the network of zoos, aquaria, etc., for *ex situ* conservation.
34. Develop networking of botanic gardens and consider establishing a 'Central Authority for Botanic Gardens' to secure their better management on the lines of Central Zoo Authority.
35. Provide for training of personnel and mobilize financial resources to strengthen captive breeding projects for endangered species of wild animals.
36. Strengthen basic research on reproduction biology of rare, endangered and endemic species to support reintroduction programmes.
37. Encourage cultivation of plants of economic value presently gathered from their natural populations to prevent their decline.
38. Promote inter-sectoral linkages and synergies to develop and realize full economic potential of *ex situ* conserved materials in crop and livestock improvement programmes.



II Augmentation of natural resource base and its sustainable utilization: Ensuring inter-and intra-generational equity

39. Secure integration of biodiversity concerns into inter-sectoral policies and programmes to identify elements having adverse impact on biodiversity and design policy guidelines to address such issues. Make valuation of biodiversity an integral part of pre-appraisal of projects and programmes to minimize adverse impacts on biodiversity.
40. Promote decentralized management of biological resources with emphasis on community participation.
41. Promote sustainable use of biodiversity in sectors such as agriculture, animal husbandry, dairy development, fisheries, apiculture, sericulture, forestry and industry.
42. Promote conservation, management and sustainable utilization of bamboos and canes, and establish bambusetum and canetum for maintaining species diversity and elite germplasm lines.
43. Promote best practices based on traditional sustainable uses of biodiversity and devise mechanisms for providing benefits to local communities.
44. Build and regularly update a database on NTFPs, monitor and rationalize use of NTFPs ensuring their sustainable availability to local communities.
45. Promote sustainable use of biological resources by supporting studies on traditional utilization of natural resources in selected areas to identify incentives and disincentives, and promote best practices.
46. Encourage cultivation of medicinal plants and culture of marine organisms exploited for drugs to prevent their unsustainable extraction from the wild.
47. Promote capacity building at grassroot level for participatory decision-making to ensure ecofriendly and sustainable use of natural resources.
48. Develop *sui generis* system for protection of traditional knowledge and related rights including intellectual property rights.
49. Encourage adoption of science-based, and traditional sustainable land use practices, through research and development, extension of knowledge, pilot scale demonstrations, and large scale dissemination including farmer's training, and where necessary, access to institutional finance.
50. Promote reclamation of wasteland and degraded forest land through formulation and adoption of multi-stakeholder partnerships involving the land owning agency, local communities, and investors.
51. Promote sustainable alternatives to shifting cultivation where it is no longer ecologically viable, ensuring that the culture and social fabric of the local people are not disrupted.
52. Encourage agro-forestry, organic farming, environmentally sustainable cropping patterns, and



adoption of efficient irrigation techniques.

53. Incorporate a special component in afforestation programmes for afforestation on the banks and catchments of rivers and reservoirs to prevent soil erosion and improve green cover.
54. Integrate wetland conservation, including conservation of village ponds and tanks, into sectoral development plans for poverty alleviation and livelihood improvement, and link efforts for conservation and sustainable use of wetlands with the ongoing rural infrastructure development and employment generation programmes.
55. Promote traditional techniques and practices for conserving village ponds.
56. Mainstream the sustainable management of mangroves into the forestry sector regulatory regime so as to ensure the protection of coastal belts and conservation of flora and fauna in those areas.
57. Disseminate available techniques for regeneration of coral reefs and support activities based on application of such techniques.
58. Adopt a comprehensive approach to integrated coastal management by addressing linkages between coastal areas, wetlands, and river systems, in relevant policies, regulations and programmes.

Regulation of introduction of invasive alien species and their management

59. Develop a unified national system for regulation of all introductions and carrying out rigorous quarantine checks.
60. Strengthen domestic quarantine measures to contain the spread of invasive species to neighbouring areas.
61. Promote intersectoral linkages to check unintended introductions and contain and manage the spread of invasive alien species.
62. Develop a national database on invasive alien species reported in India.
63. Develop appropriate early warning and awareness system in response to new sightings of invasive alien species.
64. Provide priority funding to basic research on managing invasive species.
65. Support capacity building for managing invasive alien species at different levels with priority on local area activities.
66. Promote restorative measures of degraded ecosystems using preferably locally adapted native species for this purpose.



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67. Promote regional cooperation in adoption of uniform quarantine measures and containment of invasive exotics.

IV

Assessment of vulnerability and adaptation to climate change, and desertification

68. Identify the key sectors of the country vulnerable to climate change, in particular impacts on water resources, agriculture, health, coastal areas and forests.
69. Promote research to develop methodologies for tracking changes and assessing impacts of climate change on glaciers, river flows and biodiversity.
70. Assess the need for adaptation to future impacts of climate change at national and local levels, and the scope for incorporating the outputs of such assessments in relevant programmes, including watershed management, coastal zone planning and regulation, agricultural technologies and practices, forestry management, and health programmes.
71. Explicitly consider vulnerability of coastal areas and their biodiversity to climate change and sealevel rise in coastal management plans, as well as infrastructure planning and construction norms.
72. Participate in voluntary partnerships with other countries both developed and developing, to address the challenges of sustainable development and climate change, consistent with the provisions of the UNFCCC.
73. Identify the most important gaps in knowledge that limit the national ability to develop and implement climate change adaptation strategies for species, and ecological processes and functions.
74. Enhance the capacity of climate modeling in the country substantially to get clear idea on the impacts of climate change on biodiversity at national and local levels.
75. Develop ecological criteria for identifying the species and ecosystems that are at great risk from climate change and identify their priority habitats.
76. Identify information requirements and priorities, through expert consultative processes, for long term monitoring of climate change impacts on biodiversity.
77. Establish a climate change and biodiversity website for decision makers concerned with national resource management to facilitate information exchange about the actual and potential impacts of climate change and relevant policies, strategies and programmes.
78. In view of the multidisciplinary nature of the subject, undertake an 'All India Coordinated Research Project on Impacts of Climate Change' on various facets of wild and agricultural biodiversity.
79. Integrate biodiversity concerns into measures for energy conservation and adoption of renewable

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energy technologies with a focus on local biomass resources and dissemination of improved fuelwood stoves, and solar cookers.

80. Strengthen efforts for partial substitution of fossil fuels by bio-fuels, through promotion of biofuel plantations, promoting relevant research and development, and streamlining regulatory certification of new technologies.
81. Strengthen and augment the existing programmes and activities of the Central and State Governments relating to drylands.
82. Prepare and implement thematic action plans incorporating watershed management strategies, for arresting and reversing desertification and expanding green cover.
83. Promote reclamation of wastelands by energy plantations for rural energy through multistakeholder partnerships involving the landowning agencies, local communities, and investors.

Integration of biodiversity concerns in economic and social development

84. Develop strong research base on impact assessment and conduct rigorous impact assessment of development projects, with a focus on biodiversity and habitats.
85. Integrate biodiversity concerns across development sectors (such as industry, infrastructure, power, mining, etc.) and promote use of clean technologies.
86. Accord priority to the potential impacts of development projects on biodiversity resources and natural heritage while undertaking EIA. In particular, ancient sacred groves and biodiversity hotspots should be treated as possessing incomparable values.
87. Take steps to adopt and institutionalize techniques for environmental assessment of sectoral policies and programmes to address any potential adverse impacts, and enhance potential favourable impacts.
88. Develop and integrate pre-project plans for reallocation and rehabilitation of local people likely to be displaced by development projects keeping in view their socio-cultural and livelihood needs.
89. Ensure that in all cases of diversion of forest land, the essential minimum needed land for the project or activity is permitted. Restrict the diversion of dense natural forests, particularly areas of high endemism of genetic resources, to non-forest purposes, only to site-specific cases of vital national interest.
90. Give priority to impact assessment of development projects on wetlands; in particular, ensuring that environmental services of wetlands are explicitly factored into cost-benefit analysis.

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91. Promote integrated approaches to management of river basins considering upstream and downstream inflows and withdrawals by season, pollution loads and natural regeneration capacities, in particular, for maintenance of in-stream ecological values.
92. Consider and mitigate the impacts on river and estuarine flora and fauna, and the resulting change in the resource base for livelihoods, of multipurpose river valley projects, power plants and industries.
93. Adopt best practice norms for infrastructure construction to avoid or minimize damage to sensitive ecosystems and despoiling of landscapes.
94. Support practices of rain water harvesting and revival of traditional methods for enhancing groundwater recharge.
95. Give due consideration to the quality and productivity of lands which are proposed to be converted for development activities, as part of the environmental clearance process.
96. Ensure provision for environmental restoration during commissioning and after decommissioning of industries. For example, in all approvals of mining plans, institutionalize a system of postmonitoring of projects to ensure safe disposal of tailings and ecosystem rehabilitation following the principles of ecological succession.
97. Promote, through incentives, removal of barriers and regulation, the beneficial utilization of wastes such as fly ash, bottom ash, red mud, and slag, minimizing thereby their adverse impacts on terrestrial and aquatic ecosystems.
98. Promote sustainable tourism through adoption of best practice norms for tourism facilities and conservation of natural resources while encouraging multistakeholder partnerships favouring local communities.
99. Develop and implement viable models of public-private partnerships for setting up and operating secure landfills, incinerators, and other appropriate techniques for the treatment and disposal of toxic and hazardous wastes, both industrial and biomedical, on payment by users, taking the concerns of local communities into account. The concerned local communities and State Governments must have clear entitlements to specified benefits from hosting such sites, if access is given to non-local users. Develop and implement strategies for clean-up of toxic and hazardous waste dump legacies, in particular in industrial areas, and abandoned mines, and reclamation of such lands for future, sustainable use.
100. Survey and develop a national inventory of toxic and hazardous waste dumps, and an online monitoring system for movement of hazardous wastes. Strengthen capacity of institutions responsible for monitoring and enforcement in respect of toxic and hazardous wastes.
101. Strengthen the legal arrangements and response measures for addressing emergencies arising out of transportation, handling and disposal of hazardous wastes as part of the chemical accidents regime.
102. Promote organic farming of traditional crop varieties through research in and dissemination of techniques for reclamation of land with prior exposure to agricultural chemicals, facilitating



marketing of organic produce in India and abroad, including by development of transparent, voluntary and science-based labeling schemes.

103. Develop and enforce regulations and guidelines for management of e-waste as part of the hazardous waste regime.
104. Promote, through incentives, removal of barriers, and regulations, the beneficial utilization of generally non-hazardous waste streams such as fly ash, bottom ash, red mud, and slag, including in cement and brick-making, and building railway and highway embankments.

Pollution impacts

VI

105. Minimise and eliminate activities leading to loss of biodiversity due to point and non-point sources of pollution and promote development of clean technologies.
106. Strengthen the monitoring and enforcement of emission standards for both point and non-point sources.
107. Develop location-specific work plans focusing on biodiversity conservation while managing pollution problems.
108. Treat and manage industrial effluents so as to minimize adverse impacts on terrestrial and aquatic biological resources.
109. Promote biodegradable and recyclable substitutes for non-biodegradable materials, and develop and implement strategies for their recycle, reuse, and final environmentally benign disposal, including through promotion of relevant technologies, and use of incentive based instruments.
110. Avoid excessive use of fertilizers, pesticides and insecticides while encouraging integrated pest management practices, and use of organic manures and biofertilisers.
111. Promote organic farming of locally adapted and traditional crop varieties through appropriate incentives, and direct access to markets duly supported by credible certification systems.
112. Develop a strategy for strengthening regulation, and addressing impacts, of ship-breaking activities on human health, coastal and near marine bioresources.
113. Accord priority to potential impacts on designated natural heritage sites in view of their incomparable values that merit stricter standards than in otherwise comparable situations.
114. Promote R&D on impacts of air, water and soil pollution on biodiversity and use of biological methods for pollution amelioration.

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VII

Development and integration of biodiversity databases

115. Develop an integrated national biodiversity information system with distributive linkages for easy storage, retrieval and dissemination including through augmentation of extant efforts of spatial mapping of natural resources and development of interactive databases at national level.
116. Intensify survey, identification and inventorization activities, involving local institutions and giving priority to hitherto unexplored areas.
117. Conduct regular surveys to monitor changes in populations of target species (wild and domesticated), using remote sensing and other updated tools and techniques.
118. Update list of endangered species of flora and fauna on priority, based on internationally accepted criteria.
119. Extend listing of keystone, umbrella and endemic species for conserving them on priority basis, and develop models/packages for their conservation.
120. Update database on sacred groves and sacred ponds documenting bio-resources and associated knowledge conserved at these sites.
121. Promote DNA fingerprinting, other molecular analytical techniques and studies on genetic diversity of critically endangered species to develop appropriate conservation strategies.
122. Expand area specific surveys of land races, traditional cultivars of crops, wild relatives of crop plants and breeds of domesticated animals *inter alia* through application of appropriate statistical techniques.
123. Use modern taxonomic methods for documentation/identification of species.
124. Strengthen and build capacity for taxonomy and biosystematics, particularly for groups of plants, animals and microorganisms which are as yet inadequately understood.

VIII

Strengthening implementation of policy, legislative and administrative measures for biodiversity conservation and management

125. Accelerate effective actions at the central, state and local levels to implement provisions under the Biological Diversity Act.
126. Review enabling policies to prevent transfer of prime agricultural land to non-agricultural purposes, and promote sustainability of agricultural lands.



127. Formulate suggestive policies for strengthening and supporting conservation and management of grasslands, pastoral lands, sacred groves and other areas significant for biodiversity conservation.
128. Support preparation of PBRs with technical help by the scientific institutions.
129. Strengthen systems for documentation, application and protection of biodiversity associated traditional knowledge, providing adequate protection to these knowledge systems while encouraging benefits to communities.
130. Revive and revitalize sustainable traditional practices and other folk uses of components of biodiversity and associated benefits to local communities with a view to promoting and strengthening traditional knowledge and practices.
131. Create public education and awareness about the need to conserve, protect and gainfully use traditional knowledge systems.
132. Identify emerging areas for new legislation, based on better scientific understanding, economic and social development, and development of multilateral environmental regimes, in line with the NEP.
133. Review the body of existing legislations relevant to biodiversity conservation to develop synergies among relevant statutes and regulations, eliminate obsolescence, and amalgamate provisions with similar objectives, in line with the NEP. Further, encourage and facilitate review of legislations at the level of state and local governments with a view to ensuring their consistency with this policy.
134. Review the regulatory processes for LMOs so that all relevant scientific knowledge is taken into account, and ecological, health, and economic concerns are adequately addressed.
135. Periodically review and update the national biosafety guidelines to ensure that these are based on current scientific knowledge.
136. Ensure conservation of biodiversity and human health while dealing with LMOs in transboundary movement in a manner consistent with the multilateral biosafety protocol.
137. Develop appropriate liability and redress mechanisms to internalize environment costs and address economic concerns in case of any damage to biodiversity.
138. Harmonise provisions concerning disclosure of source of biological material and associated knowledge used in the inventions under the Patents Act, Protection of Plant Varieties and Farmers' Rights Act, and Biological Diversity Act, to ensure sharing of benefits by the communities holding traditional knowledge, from such use.
139. Develop supportive regulatory regime for protection of identified wetlands and biosphere reserves.
140. Develop appropriate system and modalities for operationalizing provisions for prior informed consent and benefit sharing under the Biological Diversity Act, working towards greater congruence between these provisions and trade related aspects of intellectual property rights.



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IX

Building of national capacities for biodiversity conservation and appropriate use of new technologies

141. Develop consortium of lead institutions engaged in conservation providing linkages and networking across public and private sectors.
142. Outsource research and promote joint ventures on key conservation issues.
143. Promote application of biotechnology tools for conserving endangered species.
144. Encourage DNA profiling for assessment of genetic diversity in endangered species to assist conservation.
145. Develop DNA-probe based technology for tracking of LMOs.
146. Develop specific pilot gene banks for LMOs approved for undertaking research and commercial use.
147. Develop capacity for risk assessment, management and communication on LMOs.
148. Support pilot studies on use of biotechnology tools for conservation where appropriate.
149. Develop specific complimentary capacity building measures based on national needs and priorities for the formulation and implementation of national rules and procedures on liability and redress to strengthen the establishment of baseline information and monitoring of changes.
150. Develop protocols for monitoring products based on genetic use restriction technologies.
151. Strengthen participatory appraisal techniques and encourage formation of local institutional structures for planning and management of natural resources for ensuring participation of women.
152. Preserve and strengthen traditional, religious, ritualistic, ethical and cultural methods of conservation.
153. Promote livelihood diversification opportunities for making value added bioresource based products and building upon traditional as well as emerging environmental technologies customized at local/field level.
154. Strengthen manpower, infrastructure and other pertinent capacities including upgradation of skills of officials of the MoEF to enable it to address new and emerging requirements in the field of biodiversity conservation and management.
155. Strengthen capabilities of BSI and ZSI and promote their technical cooperation with SBBs and BMCs.
156. Augment human resource development and personnel management in forestry and wildlife sector.
157. Strengthen multidisciplinary R&D efforts on key areas pertaining to conservation and management of biological diversity.
158. Strengthen and support departments of biology, botany, zoology, sociology, anthropology and other



relevant disciplines in central, state and deemed universities/ colleges, with a view to raising the standard of research and producing faculty who could guide the process of environmental education in schools.

159. Promote both formal and non-formal means for environment education and biodiversity conservation.
160. Design and implement awareness programmes, particularly for rural women, and also benefit from their wisdom. Women's organizations such as women's councils and mahila mandals could be used for this purpose.
161. Incorporate modules on conservation and sustainable utilization of biodiversity in foundational and professional training courses for the officers of various services.
162. Promote and/or strengthen education, training, awareness and extension programmes on biodiversity issues for various stakeholders including all levels of students, professionals (such as engineers, doctors, lawyers, CAs, etc.), elected representatives (such as representatives of PRIs, MLAs, MPs, Majors, etc.), judiciary, NGOs, public and private sectors (e.g. corporate representatives, industrial associations etc.), defence and para military forces, customs, police, media, cultural, spiritual and religious institutions/ individuals.
163. Enhance public education and awareness for biodiversity conservation through audio, visual and print media.
164. Promote activities relating to animal welfare.

Valuation of goods and services provided by biodiversity, and use of economic instruments in decision making processes

165. Develop a system of natural resource accounting reflecting the ecological as well as economic values of biodiversity, with special attention to techniques of green accounting in national accounts and estimation of positive and negative externalities for use of various types of natural resources in the production processes as well as in household and government consumption.
166. Develop suitable valuation models for adoption at national, state and local levels.
167. Support projects and pilot studies aimed at validating methods of valuation of bioresources.
168. Identify key factors and indicators to assess effectiveness of valuation methods and models, taking into consideration the UN guidelines on monitoring and evaluation of socio-economic projects.
169. Assess the utility of traditional and innovative fiscal instruments for promoting conservation and sustainable utilization of biodiversity.



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170. Develop systems for partial ploughing back of the revenues generated in protected areas, zoological parks, botanical gardens, aquaria, etc., for improving their management.
171. Mobilize additional resources based on project formulation for biodiversity conservation.

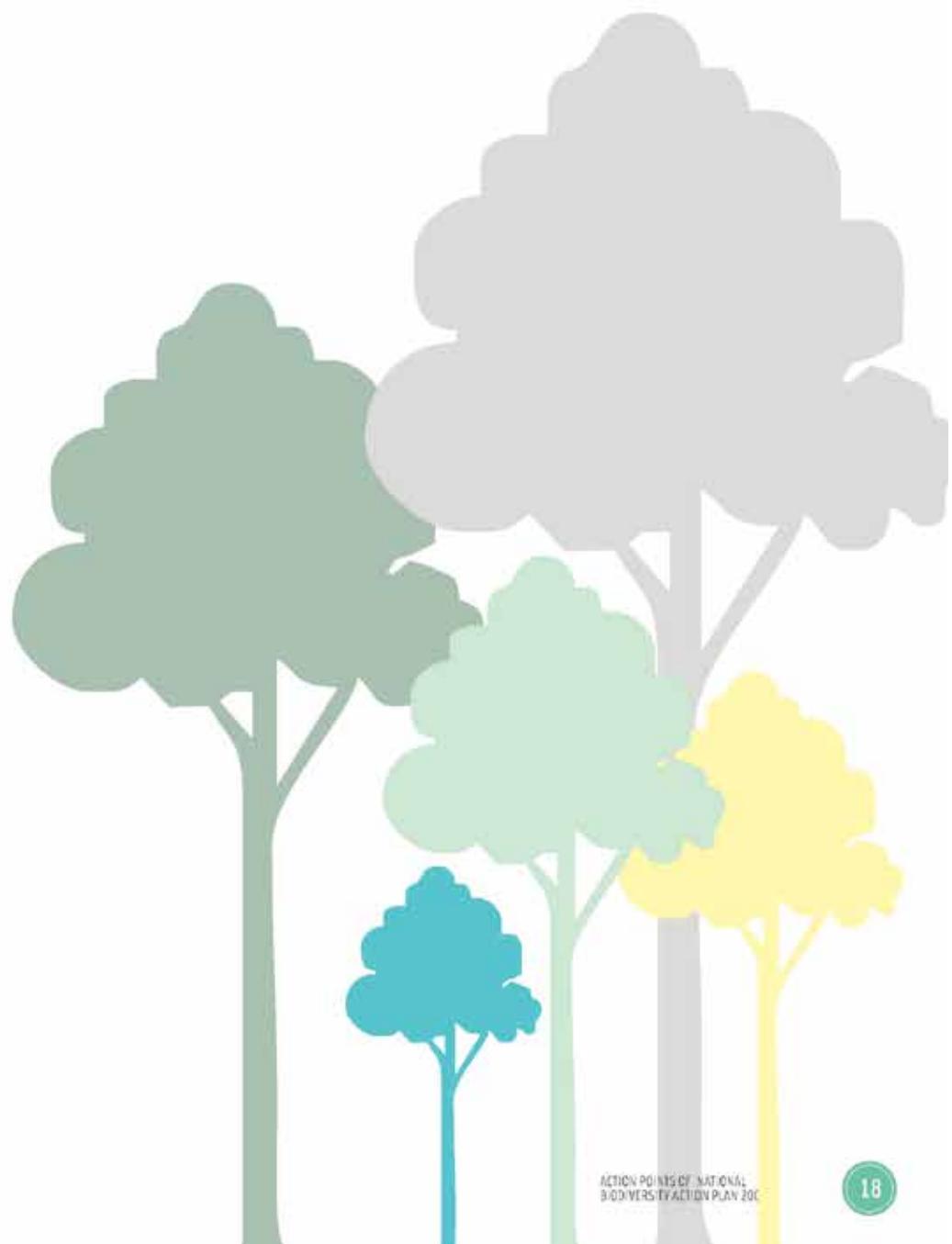
XI

International cooperation

172. Further consolidate and strengthen global cooperation, especially with UN agencies and other international bodies on issues related to biodiversity.
173. Promote regional cooperation for effective implementation of suitable strategies for conservation of biodiversity, especially with neighbouring countries through flora such as SAARC, ASEAN and ESCAP.
174. Develop projects for accessing funds for conservation and sustainable use of biodiversity from external sources, earmarked for conservation through bilateral, regional and other multilateral channels.
175. Promote technology transfer and scientific cooperation towards conservation of biological resources, their sustainable use and equitable sharing of benefits arising out of their use, taking also into account extant regulations including those relating to taxation.



ADDENDUM 2014
TO NBSAP 2008



ACTION POINTS OF NATIONAL
BIODIVERSITY ACTION PLAN 2008

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ACTION POINTS OF PROGRAMME OF WORK ON PROTECTED AREAS 2012

1.4

NATIONAL BIODIVERSITY
ACTION PLAN (NBAP)

In order to implement CBD's PoWPA, India prepared an Action Plan in 2012 (MoEF 2012 a) which comprises the following key steps to be pursued under each action:

Action 1

Development of Site Specific Management Plans

- Inventory and Assessment
- Capacity Building
- Equipments
- Preparation of Site Specific Management Plan

Action 2

Integration of PAs (Securing Identified Corridors and Connectivity Areas)

- Public awareness and support
- Demonstration of mainstreaming corridors and connectivity for 50 sites
- Action Plan for corridors and connectivity areas of identified sites

Action 3

Diversifying the Governance Types

- Participatory Wildlife Monitoring for strengthening management

Action 4

Protected Area Valuation Assessment

- Targeted studies on PA valuation assessment in select PAs

Action 5

Climate Change Resilience and Adaptation Assessment

- Targeted studies on Climate Change Resilience and Adaptation Assessment in select PAs

ADDENDUM 2014
TO RBAP 2008

The 12 NBTs along with the indicators and monitoring framework are given in Table 1, with a view to facilitate monitoring of trends and recording progress in their implementation through a consultative process. The agencies that have been identified on the basis of their mandate, domain expertise and geographical coverage for monitoring the progress in achieving the NBTs are also depicted in Table 1. While the frequency of monitoring of the 12 NBTs ranges from three to five years, data may be recorded yearly or more frequently by different agencies. Once the data are first reported for three years, these will be reviewed for any mid-course correction that may be required, and any changes will be incorporated appropriately.

NATIONAL BIODIVERSITY TARGETS

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Table 1. National Biodiversity Targets: Indicators and Monitoring Framework

National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (indicative list)	Frequency of monitoring/report
 By 2020, a significant proportion of the country's population, especially the youth, is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.		Trends in incorporating awareness and attitudes towards environmental conservation through communication and mainstream education	<ul style="list-style-type: none"> Number of students opting for higher-level elective subjects and specialization in environmental education (EE) Numbers of schools enrolled in the National Environment Awareness Campaign, National Green Corps-Eco Clubs Programme, Parivar Mitra (Friends of the Environment) Programme, Global Learning and Observations, Gyan Vigyan Vigyan, birdwatching clubs, DNA clubs (DBT's Natural Resource Awareness Clubs), etc. Trends in coverage of environment-related programmes and projects with enhanced involvement of youth Trends in visits to protected areas (PAs), natural history museums and exhibitions and zoological/botanical gardens 	ISC/ICSE and CBSE boards MoEF, Youth for Coastal Marine Conservation, South Asia Youth Environment Network (SAYEN), Ministry of Human Resource Development (MoHRD)-Department of Education Centre for Environment Education (CEE), C.R. Environmental Education Centre (CPREEC), Centre for Media Studies (CMS), Department of Biotechnology (DBT) Ministry of Sports and Youth Affairs (MoSYA) State forest departments (Wildlife Wing), Central Zoo Authority (CZA), CEE	2 years 2 years 2 years 2 years
		Trends in promoting awareness at local levels	<ul style="list-style-type: none"> Trends in number of Biodiversity Management Committees (BMCs) constituted/operationalized Trends in number of people's biodiversity registers (PBRs) prepared Trends in number of Joint Forest Management Committees (JFMCs) constituted/operationalized Trends in number of civil society organizations/NGOs, Panchayati Raj Institutions, Community Forest Rights (CFR) committees (under Forest Right Act (FRA), 2006) engaged in creating environmental awareness 	National Biodiversity Authority (NBA)/State Biodiversity Boards (SBBs) State forest departments, MoEF CEE MoPR Ministry of Tribal Affairs (MoTA)	2 years 2 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (Indicative list)	Frequency of monitoring/ report
 <p>By 2020, values of biodiversity are integrated in national and state planning processes, development programmes and poverty alleviation strategies.</p>	 <p>2</p>	<p>Trends in incorporating natural resource/biodiversity/ecosystem service values in national and state planning processes and development programmes</p>	<ul style="list-style-type: none"> Trends in biodiversity and ecosystem services valuation studies Trends in number and coverage of studies -TEEB, NPV relating to biodiversity Trends in number and effectiveness of measures developed in the Mahatma Gandhi National Rural Employment Guarantee Act programme (MGNREGA) and Integrated Watershed Management Programme (IWMP) for protection and enhancement of ecosystem services and biodiversity Trends in biodiversity-inclusive climate change adaptation and mitigation measures formulated/implemented Trends in area covered by catchment area treatment under irrigation projects 	<p>Institute of Economic Growth (IEG), Indira Gandhi Institute for Development Research (IGIDR), Indian Institute of Forest Management (IIFM), MoEF Ministry of Rural Development (MoRD), MoTA, state forest departments State climate change cells</p>	3 years
		<p>Trends in integration of biodiversity and ecosystem service values into sectoral and development policies and programmes</p>	<ul style="list-style-type: none"> Trends in studies on economic and non-economic valuation of selected ecosystem services Trends in reflection of biodiversity and ecosystem services in policy decisions, planning and reporting processes 	IIFM, IGIDR, IEG, MoEF, NBA	3 years
		<p>Trends in policies considering biodiversity and ecosystem services in environmental impact assessment and strategic environmental assessment</p>	<ul style="list-style-type: none"> Trends in number of studies on biodiversity-inclusive environment impact assessment, cumulative environment impact assessment (CEIA) and strategic environment assessment (SEA) Trends in identification, assessment, establishment and strengthening of incentives that reward positive contributions to biodiversity and ecosystem services 	MoEF, Planning Commission Ministry of Corporate Affairs (MoCA)	3 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (indicative list)	frequency of monitoring/ report
	 	Trends in forest cover	<ul style="list-style-type: none"> Change in proportion of forest cover in different forest categories (VDF, MDF, DF and Scrub) 	Forest Survey of India (FSI)	3 years
Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are finalized and actions put in place by 2020 for environmental amelioration and human well-being.		Trends in aquatic ecosystems	<ul style="list-style-type: none"> Changes in area under riverine ecosystems and wetlands (terrestrial and coastal) Number of wetlands under integrated management plans 	Department of Space (DoS), Wetlands International-South Asia, SACON	3 years
		Trends in mangrove cover and coastal area management	<ul style="list-style-type: none"> Change in mangrove cover over the years Trends in area covered under integrated coastal area management 	FSI; Integrated Coastal and Marine Area Management (ICMAM), Ministry of Earth Sciences; Integrated Coastal Zone Management (ICZM) Project Unit of Society of Integrated Coastal Management (SACOM); National Centre for Sustainable Coastal Management (NCSCM), MoEF, DoS	2 years
		Trends in river water quality	<ul style="list-style-type: none"> Changes in water quality (by interception, diversion and treatment of domestic sewage and preventing agricultural runoff, toxic wastes, industrial effluents, chemical wastes and unburnt bodies from entering water bodies) 	National Ganga Authority, National River Conservation Directorate (NRCD) (Ganga Action Plan, Yamuna Action Plan and other action plans for polluted water bodies), SPCBs, CPCB	2 years
		Trends in afforestation and restoration	<ul style="list-style-type: none"> Monitoring canopy cover, grasslands and traditional grazing lands Monitoring carbon stock Assisted natural regeneration Rehabilitation of mined out areas 	Green India Mission, NRSC, DoS, ICFRE, forest departments, FSI, Central Mine Planning and Design Institute (CMPDI)	3 years
		Combating desertification	<ul style="list-style-type: none"> Trends in land degradation Status and trends in area under desert, levels of water in wells/groundwater table 	National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), Department of Agriculture & Cooperation, Disaster Management Support Programme, DoS, Department of Land Resources, Ministry of Rural Development, Ministry of Water Resources	2 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (Indicative list)	Frequency of monitoring/ report
		Species restoration after forest and water body restoration	<ul style="list-style-type: none"> Status of selected indicator species 	Green India Mission, state forest departments	3 years
		Trends in maintenance of fertility in agricultural lands using natural methods and means	<ul style="list-style-type: none"> Soil health records Organic carbon and humus buildup Trends in keeping the health of near-pristine soils, being awarded titles under FRA in forest areas 	Ministry of Agriculture, state forest departments	3 years
			<ul style="list-style-type: none"> Number and coverage of management plans developed for prioritized invasive species and integration with PA management plans and wetland management plans Change in area affected by invasive species 	Forest departments, DoS, Wetlands International-South Asia, SACON, ICFRE (Forest Invasive Species Cell), WII, CMLRE, National Institute of Oceanography (NIO), Annamalai University Faculty of Marine Sciences, CABI South Asia	
 By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed.		Trends in invasive alien species management	<ul style="list-style-type: none"> Number and coverage of management plans developed for prioritized invasive species and integration with PA management plans and wetland management plans Change in area affected by invasive species 	Forest departments, DoS, Wetlands International-South Asia, SACON, ICFRE (Forest Invasive Species Cell), WII, CMLRE, National Institute of Oceanography (NIO), Annamalai University Faculty of Marine Sciences, CABI South Asia	3 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (indicative list)	frequency of monitoring/ report
 <p>By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries.</p>	  	<p>Trends in sustainable agriculture</p>	<ul style="list-style-type: none"> Trends in area under organic farming, Integrated pest management Trends in organic farming certification Trends in the production/usage of agrochemical fertilizers Trends in the use of bio-fertilizers/biofuels, organic manure and vermicompost Trends in soil quality and land use Trends in energy consumption (by types/source) in farms Trends in groundwater table Trends in increased acreage under organic production on farms of agricultural research institutions and universities Trends in enhanced use of landraces Trends in proliferation of local crops and varieties that are more adapted to the environment, requiring less external inputs and therefore more integrated in the ecosystem, at the same time enhance prospects of greater household food security. Trends in analysis of agricultural policies and programmes that adversely affect ecosystem services such as pollination 	<p>Department of Agriculture, ICAR Department of Fertilizers, APEDA NBSSEUP ICAR ICAR Ministry of Agriculture, Ministry of Rural Development, Ministry of Consumer Affairs, Food and Public Distribution, district administration Ministry of Agriculture</p>	3 years
			<p>Monitoring agricultural extension</p> <ul style="list-style-type: none"> Trends in awareness levels of farmers Trends in awareness levels of extension service staff, scientists and agricultural research system with relation to agro-biodiversity and associated knowledge 	<p>Department of Agriculture ICAR</p>	3 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite indicator	Description of indicator	Responsible agencies (indicative list)	Frequency of monitoring/report
		Trends in sustainable forestry	<ul style="list-style-type: none"> Trends in area of degraded forests Trends in area of restored forests Trends in proportion of products derived from sustainable sources 	Green India Mission, IIMF, ICFRE, FRI	3 years
		Trends in stock sizes of target and bycatch fish species (freshwater and marine)	<ul style="list-style-type: none"> Trends in catch per unit effort (cpue) 	Fishery Survey of India, Central Marine Fisheries Research Institute (CMFRI), National Fisheries Development Board (NFDB), CMLRE (for deeper water marine fishes), NBFGR	3 years
		Trends in intensity of destructive fishing practices	<ul style="list-style-type: none"> Trends in sale of large-scale or destructive fishing gear (e.g. purse-seine, bottom trawlers) Trends in area covered by trawlers Trends in frequency of trawling 	Department of Animal Husbandry, Dairying & Fisheries, NFDB, Central Institute of Fisheries Technology (CIFT), Fishery Survey of India	3 years
			<ul style="list-style-type: none"> Trends in certification of fish produce 	Marine Products Export Development Authority	Annual
		Trends in sustainable fishing practices Trends in number of fishing boats/fishing capacity	<ul style="list-style-type: none"> Trends in number of licences issued to fishing boats in coastal states Trends in fishing effort capacity 	NFDB, Department of Fisheries of each coastal state	3 years
 6 Ecologically representative areas under terrestrial and inland water, and also coastal and marine zones, especially those of particular	 10  11  12	Trends in PA coverage under four legal categories (National Park, Wildlife Sanctuary, Community Reserve and Conservation Reserve)	<ul style="list-style-type: none"> Change in number/area/percentage of PAs over time 	Wildlife Institute of India (WII)	3 years
		Trends in other area-based conservation measures	<ul style="list-style-type: none"> Area/number of initiatives 	Indigenous Peoples' and Community Conserved Territories and Areas (ICCAs) consortium, UNDP India, WWF	3 years
		Trends in coverage under Biodiversity Heritage Sites (BHS) under the Biological Diversity Act 2002	<ul style="list-style-type: none"> Change in number/area/percentage of BHSs over time 	National Biodiversity Authority, SBFs	3 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (indicative list)	frequency of monitoring/ report
importance for species, biodiversity and ecosystem services, are conserved effectively and equitably, based on protected area designation and management and other area-based conservation measures and are integrated into the wider landscapes and seascapes, covering over 20% of the geographic area of the country, by 2020.		Trends in wetlands brought under integrated management	<ul style="list-style-type: none"> Changes in area and ecological status of wetlands through implementation of integrated management plans Changes in abundance and diversity of waterbird species in wetlands over time Trends in coverage of sites of International Importance for migratory species under CMS convention 	SACON, Wetlands International-South Asia, DoS Wetlands International-South Asia, BNHS, SACON Wetlands International-South Asia, BNHS, SACON	3 years
		Trends in Important Bird Areas (IBAs)	<ul style="list-style-type: none"> Change in number/area of Important Bird Areas (IBAs) over time 	Bombay Natural History Society (BNHS)	3 years
		Status and population trends of 16 IOWH terrestrial species and 7 marine species	<ul style="list-style-type: none"> Population trends of selected species (16 terrestrial and 7 marine species) 	For terrestrial species: Zoological Survey of India (ZSI), WII, SACON, BNHS, NCF, WII, WWF, IISc For marine species: CMLRE, ZSI, Fishery Survey of India, National Centre for Antarctic & Oceanic Research (NCAOR), CMFRI	5 years
		Trends in forest cover in four designated categories	<ul style="list-style-type: none"> Change in proportion of forest cover in different forest categories (VDF, MDF, DF, Scrub) 	FSI	2 years
		Trends in status of Indian plant and animal species included in IUCN Red Data Book	<ul style="list-style-type: none"> Conservation status of species, subspecies and varieties and even selected subpopulations at a national scale in order to highlight taxa threatened with extinction and therefore promote their conservation 	IUCN-India, ZSI, BSI, WII	4 years
		Trends in air and water quality and in noise pollution	<ul style="list-style-type: none"> Status and trends of ambient air quality; monitoring water quality for physico-chemical and bacteriological parameters, trace metals, pesticides at selected sites; trends in noise levels 	CPCB, SPCBs	Yearly
		Status of ecosystem services of selected ecosystems	<ul style="list-style-type: none"> Status of ecological services of selected ecosystems including agricultural landscapes 	IIFM, IEG	5 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (Indicative list)	Frequency of monitoring/ report
		Trends in areas of exceptional agricultural biodiversity and their threat status	<ul style="list-style-type: none"> Assessing the conservation status of landraces and varieties to highlight threatened status and therefore promote conservation 	Ministry of Agriculture, State Biodiversity Boards	5 years
 By 2020, genetic diversity of cultivated plants, farm livestock, and their wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.		Animal genetic diversity Plant genetic diversity	<ul style="list-style-type: none"> Trends in number of indigenous/domesticated breeds (<i>in situ</i>) Trends in populations of domestic breeds (<i>in situ</i>) Effectiveness of initiatives/measures taken to conserve indigenous animal varieties Trends in germplasm accessions in <i>ex situ</i> collections <ul style="list-style-type: none"> Trends in numbers of indigenous varieties (<i>in situ</i>) Trends in area under cultivation, production/yield (<i>in situ</i>) Effectiveness of initiatives/measures taken to conserve indigenous crop varieties and their wild relatives Trends in germplasm accessions in <i>ex situ</i> collections 	National Bureau of Animal Genetic Resources (NBAGR) Department of Agriculture Agriculture universities	3 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (indicative list)	frequency of monitoring/ report
 By 2020, ecosystem services, especially those relating to water, human health, livelihoods and well-being, are enumerated and measures to safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections.		Human development index-standard of living in India	<ul style="list-style-type: none"> Trends in number of people with access to primary/secondary education/health services/safe drinking water/electricity/road connectivity Trends in number of women with access to primary/secondary education/health services/safe drinking water/electricity/road connectivity 	MoHRD Ministry of Health and Family Welfare	2 years
		Level of toxic contaminants in wetlands/rivers/aquatic fauna	<ul style="list-style-type: none"> Trends in pollution status of wetlands of international (Ramsar sites) and national (identified by state governments) importance Level of toxic contaminants in rivers that provide freshwater for human use Levels of toxic contaminants in aquatic/terrestrial fauna 	Central Pollution Control Board (CPCB) Indian Institute of Toxicology Research	2 years
		Extent of restored forest cover in India	<ul style="list-style-type: none"> Trends in area of forests under restoration Trends in area under plantations in rural/urban areas Trends in very dense forest/moderately dense forest in protected areas 	FSI; REDD+ Green India Mission JFM programme ICFRE/FRI	2 years
		Extent of groundwater pollution and groundwater levels	<ul style="list-style-type: none"> Trends in groundwater levels Trends in proportion of groundwater available for use 	Central Ground Water Board	2 years
		Trends in use of chemicals and fertilizers in agriculture/organic products	<ul style="list-style-type: none"> Agricultural area under chemicals/ fertilizers/ pesticides use Agricultural area under organic farming in agro-ecosystems Level of nitrogen/phosphorus/essential nutrients in soil 	Department of Agriculture Indian Agriculture Research Institute NASSLUP	2 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (Indicative list)	Frequency of monitoring/ report
		Trends in wetlands significant for delivering freshwater being brought under integrated management	<ul style="list-style-type: none"> Area of wetlands such as lakes and ponds under integrated management 	SACON, Wetlands International-South Asia, BNHS, DoS	3 years
		Trends in proportion of people using improved water services	<ul style="list-style-type: none"> Trends in number of people with access to potable water Trends in number of households with tap water connections 	Ministry of Drinking Water and Sanitation	2 years
		Trends in availability of urban greenspaces	<ul style="list-style-type: none"> Area under greenspaces in urban centres (as a proxy to conservation of urban biodiversity) 	Ministry of Urban Development, School of Planning and Architecture (SPA)	3 years
		Trends in access to genetic resources and equitable sharing of benefits	<ul style="list-style-type: none"> Trends in number of proposals for intellectual property rights Trends in number of cases seeking third party transfer for accession of biological resources and associated traditional knowledge Trends in number of cases for seeking prior approval of IBA for transferring the results of research to foreign nations, companies, NRIs for commercial purposes Trends in number of cases seeking approval to bio-resources and associated traditional knowledge for commercial utilization 	NBA, SBRs Departments of Agriculture, Animal Husbandry and Fisheries, ICAR, Controller General of Patents, Designs & Trademarks	3 years
By 2015, Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization as per the Nagoya Protocol are operational, consistent with national legislations.					



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (indicative list)	frequency of monitoring/ report
 <p>By 2020, an effective, participatory and updated national biodiversity action plan is made operational at different levels of governance</p>	 	Progress in implementing National Biodiversity Action Plan (NBAP)	<ul style="list-style-type: none"> Trends in preparation of State Biodiversity Action Plans (SBAPs) Trends in implementing the activities envisaged under SBAPs 	SBBs and state planning boards, NBA, MoEF, Departments of Forests, Agriculture, Animal Husbandry and Fisheries	3 years
 <p>By 2020, national initiatives using communities' traditional knowledge relating to biodiversity are strengthened, with the view to protecting this knowledge in accordance with national legislations and international obligations.</p>		Trends in documentation/data abstraction and management	<ul style="list-style-type: none"> Number of traditional herbal formulations documented from codified systems of Indian medicine Number of transcriptions Number of folk uses of medicinal plants documented from PBRs prepared by BMCs 	TKOL- AYUSH-CSIR unit	3 years
		Trends in access agreements related to traditional knowledge (TK)	<ul style="list-style-type: none"> Number of potential 'bio-piracy'/wrong patent cases prevented Number of patents and A85 based on TK derived from folk knowledge 	NBA	3 years
		Trends in grassroots innovations and traditional practices	<ul style="list-style-type: none"> Number of innovations and traditional practices documented 	Controller General of Patents, Designs & Trademarks, NBA	3 years
		Trends in capacity building related to TK and PBRs	<ul style="list-style-type: none"> Training/capacity building at local and community levels Numbers of BMCs and PRI Institutions trained 	National Innovation Foundation (NIF), NBA, SBBs and Foundation for Revitalisation of Local Health Traditions (FRLHT), BSI, state forest academies and training centres, ICERI	3 years



National Biodiversity Target	Corresponding Aichi Biodiversity Target	Composite Indicator	Description of Indicator	Responsible agencies (Indicative list)	Frequency of monitoring/ report
		Trends in conservation and sustainable use of medicinal plants used by India's medical heritage	<ul style="list-style-type: none"> Number of medicinal plant conservation areas (MPCAs) established in the country Trends in collection of plants providing raw drugs used in Indian systems of medicine 	MoEF, National Medicinal Plant Board (NMPB), FRLHT NMPB	3 years
		Trends in documentation and awareness of the conservation traditions in TK	<ul style="list-style-type: none"> Documentation and awareness meetings/capacity building workshops/seminars/conferences for various target groups (NGOs, CBOs, Mahila Mandals, academicians) Trends in number of PBRs prepared 	CPREEC MoHRD NBA	3 years
 By 2020, opportunities to increase the availability of financial, human and technical resources to facilitate effective implementation of the Strategic Plan for Biodiversity 2011-2020 and the national targets are identified and the Strategy for Resource Mobilization is adopted.	  	Trends in availability of financial, human and technical resources for achieving 20 Aichi Biodiversity Targets and 12 National Biodiversity Targets	<ul style="list-style-type: none"> Trends in financial resources made available for implementing Aichi and National Biodiversity Targets Trends in human resources made available for implementing Aichi and National Biodiversity Targets Trends in technical resources made available for implementing Aichi and National Biodiversity Targets 	Planning Commission, MoEF NBA SBRs State forest departments; MoHRD DoS, MoST, Indian Meteorological Department (IMD)/MoES	3 years

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008 AND THE 12 NATIONAL BIODIVERSITY TARGETS

1.6

NATIONAL BIODIVERSITY
ACTION PLAN (NBAP)

The actionable points under India's NBAP 2008 bear close harmonization with the 12 NBTs developed in 2014, as can be seen in Table 2. The 12 NBTs capture the essence of NBAP 2008 and its actions points that call for strengthening of *in situ*, on farm, and *ex situ* conservation; augmentation of natural resource base and its sustainable utilization; regulation of introduction of invasive species and their management; vulnerability assessment regarding climate change and desertification; integration of biodiversity concerns in socio-economic development; impacts of pollution; development of biodiversity databases; strengthening implementation of policy, legislative and administrative measures for biodiversity conservation and management; national capacity building; and appropriate use of new technologies; biodiversity valuation and use of economic instruments in decision-making; and global cooperation on issues related to biodiversity. The four-colour scheme in Table 2 depicts whether the linkage between actionable points of NBAP 2008 and the 12 NBTs is direct, indirect, is at a tertiary level, or has a peripheral connect.

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

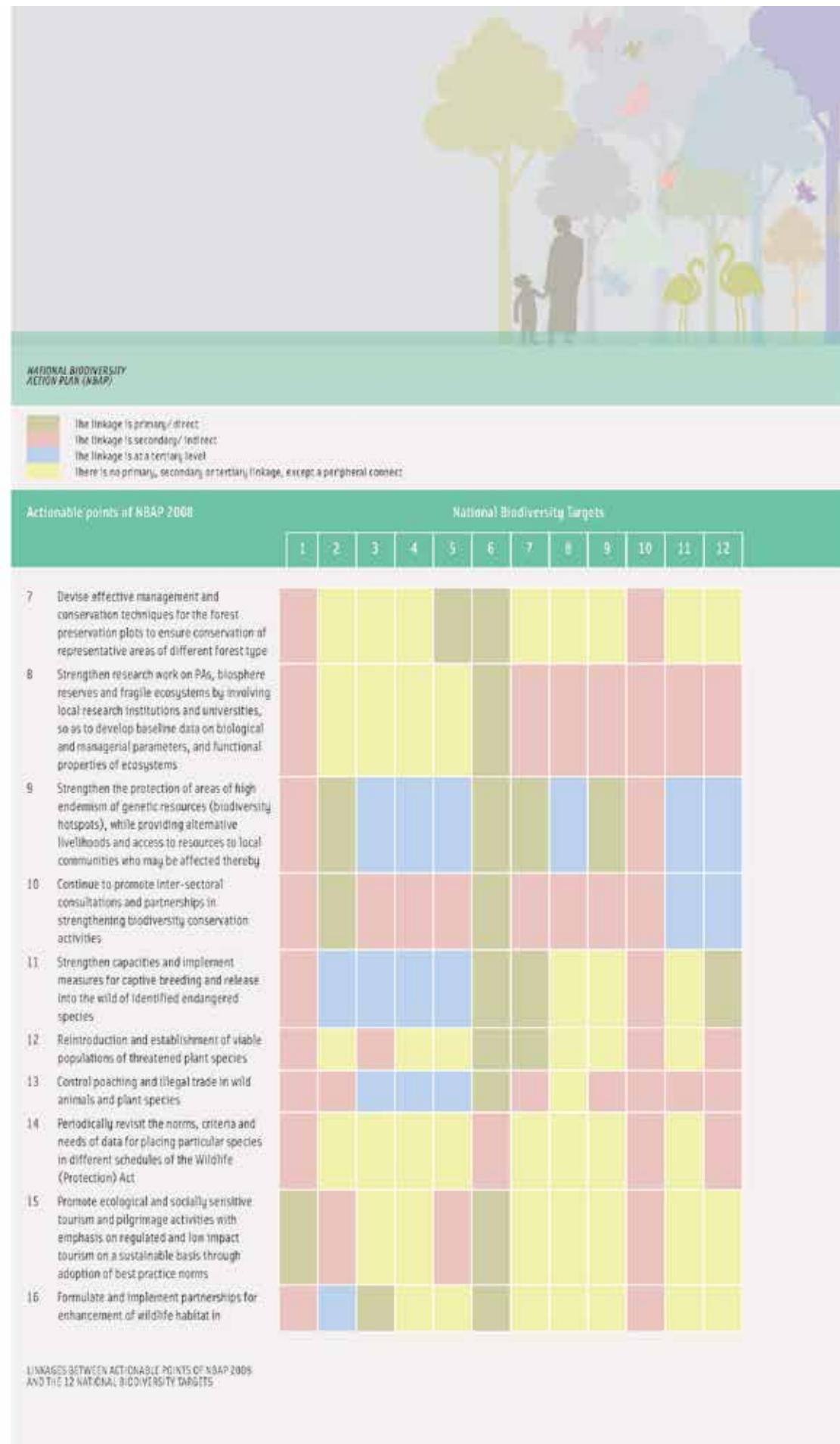
ADDENDUM 2014
TO NBAP 2008

Table 2. Linkages between Actionable Points of NBAP 2008 and National Biodiversity Targets

- The linkage is primary/ direct
- The linkage is secondary/ indirect
- The linkage is at a tertiary level
- There is no primary, secondary or tertiary linkage, except a peripheral connect

Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
Strengthening and integration of <i>in situ</i>, on-farm and <i>ex situ</i> conservation												
<i>In Situ</i> Conservation												
1	Expand the Protected Area (PA) network of the country including Conservation and Community Reserves, to give fair representation to all biogeographic zones of the country. In doing so, develop norms for delineation of PAs in terms of the objectives and principles of the National Environment Policy, in particular, participation of local communities, concerned public agencies, and other stakeholders, who have direct and tangible stake in protection and conservation of wildlife, to harmonize ecological and physical features with needs of socio-economic development											
2	Establish self-sustaining monitoring system for overseeing the activities and effectiveness of the PA network											
3	Ensure that human activities on the fringe areas of PAs do not degrade the habitat or otherwise significantly disturb wildlife											
4	Mitigate man-animal conflicts											
5	Promote site-specific eco-development programmes in fringe areas of PAs, to restore livelihoods and access to forest produce by local communities, owing to access restrictions in PAs											
6	Promote voluntary relocation of villages from critical habitats of PAs											

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

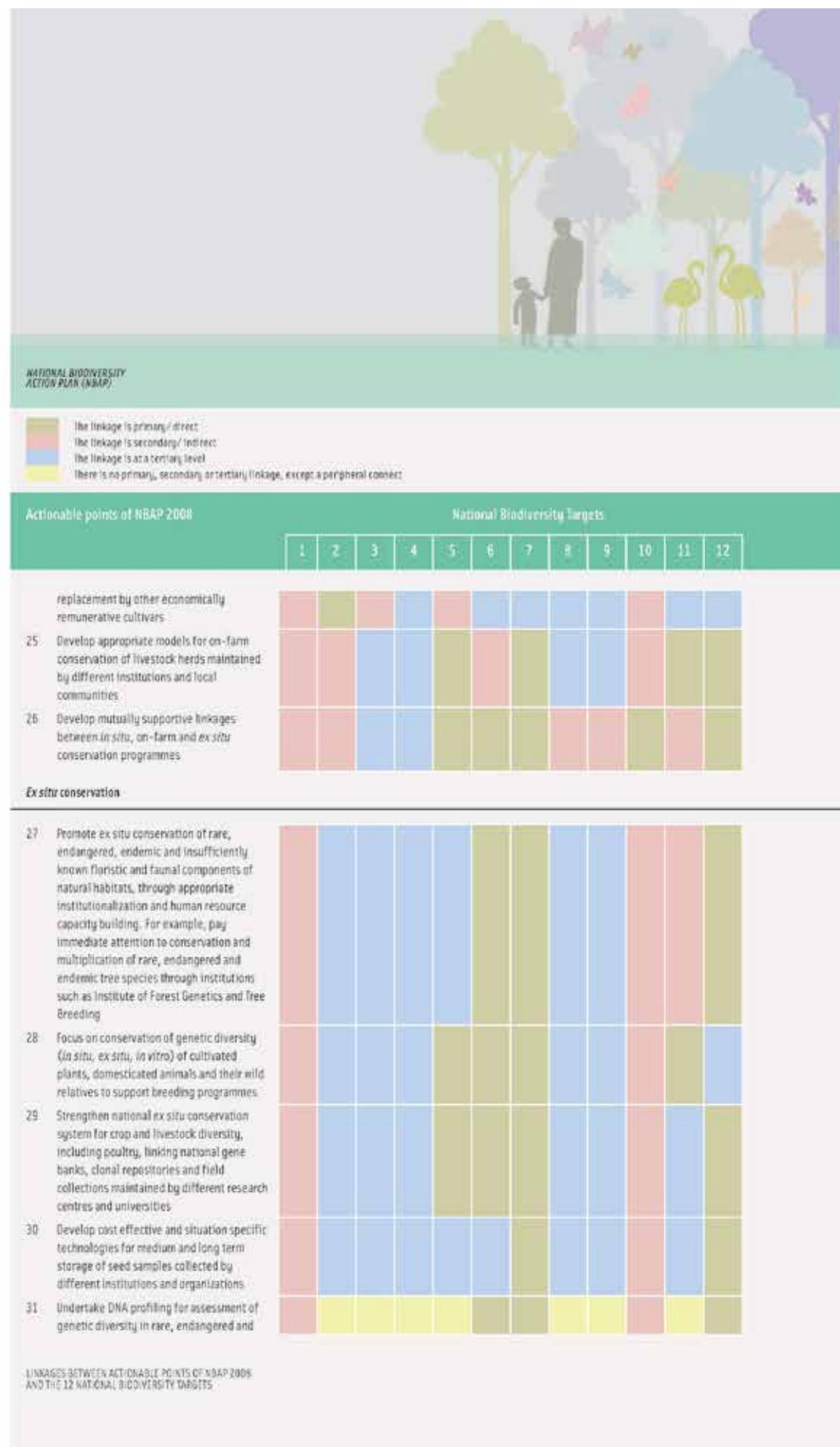


ADDENDUM 2014
TO NBAP 2008

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Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
Conservation Reserves and Community Reserves, on the lines of multi-stakeholder partnerships for afforestation, to derive both environmental and eco-tourism benefits	Red	Blue	Green	Yellow	Yellow	Green	Yellow	Yellow	Red	Yellow	Yellow	Yellow
17. Promote conservation of biodiversity outside the PA network, on private property, on common lands, water bodies and urban areas	Red	Green	Green	Green	Green	Green	Green	Green	Red	Green	Green	Blue
18. Formulate and implement programmes for conservation of endangered species outside PAs	Red	Green	Red	Green	Red	Red	Red	Blue	Red	Red	Red	Red
19. Ensure conservation of ecologically sensitive areas, which are prone to high risk of loss of biodiversity due to natural or anthropogenic factors	Red	Green	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Red	Blue	Blue
20. Ensure that survey and bioprospecting of native economically important biological resources is undertaken on a priority basis	Red	Blue	Blue	Blue	Blue	Blue	Blue	Red	Green	Green	Green	Green
21. Integrate conservation and wise use of wetlands and river basins involving all stakeholders, in particular local communities, to ensure maintenance of hydrological regimes and conservation of biodiversity	Green	Green	Red	Green	Red	Green	Green	Red	Red	Red	Red	Blue
22. Consider particular unique wetlands as entities of incomparable values, in developing strategies for their protection and formulate conservation and prudent use strategies for the identified wetlands with participation of local communities and other stakeholders	Green	Green	Red	Green	Green	Green	Green	Blue	Blue	Green	Green	Blue
On-farm conservation												
23. Identify hotspots of agro-biodiversity under different agro-ecozones and cropping systems and promote on-farm conservation	Red	Green	Red	Green	Green	Green	Green	Red	Green	Green	Green	Green
24. Provide economically feasible and socially acceptable incentives such as value addition and direct market access in the face of	Red	Green	Red	Blue	Red	Blue	Blue	Blue	Red	Blue	Blue	Blue

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS



ADDENDUM 2014
TO NBAP 2008

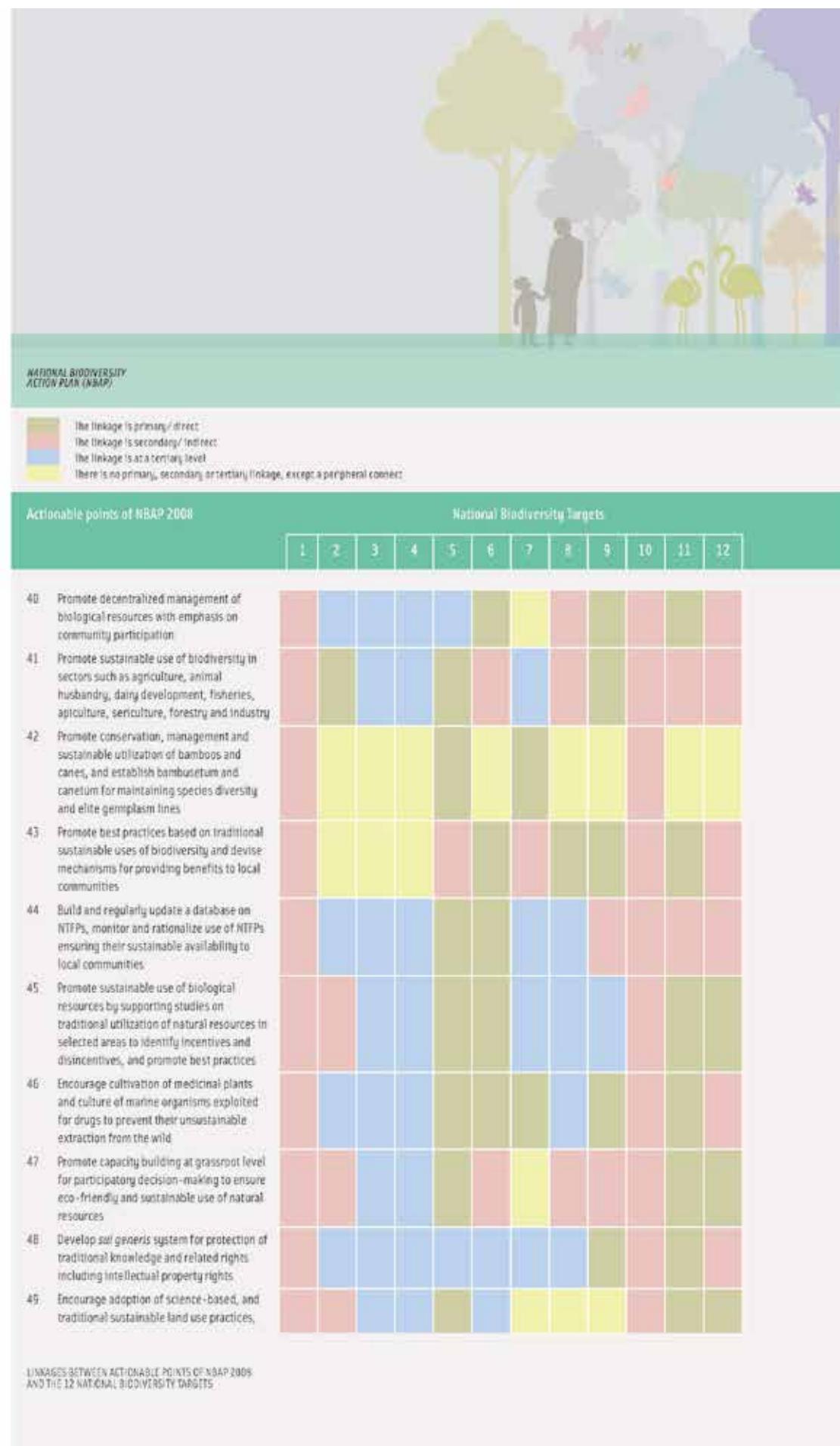
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Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
endemic species to assist in developing their conservation programmes	Red	Yellow	Red	Yellow	Yellow	Red						
32. Develop a unified national database covering all ex-situ conservation sites	Red	Yellow	Red	Red	Red	Red						
33. Consolidate, augment and strengthen the network of zoos, aquaria, etc., for ex-situ conservation	Red	Yellow	Red	Yellow	Red	Red						
34. Develop networking of botanic gardens and consider establishing a 'Central Authority for Botanic Gardens' to secure their better management on the lines of Central Zoo Authority	Red	Yellow	Red	Yellow	Red	Red						
35. Provide for training of personnel and mobilize financial resources to strengthen captive breeding projects for endangered species of wild animals	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Red	Yellow	Red	Red
36. Strengthen basic research on reproduction biology of rare, endangered and endemic species to support reintroduction programmes	Red	Yellow	Red	Yellow	Red	Red						
37. Encourage cultivation of plants of economic value presently gathered from their natural populations to prevent their decline	Red	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Red	Red	Red	Red
38. Promote inter-sectoral linkages and synergies to develop and realize full economic potential of ex-situ conserved materials in crop and livestock improvement programmes	Red	Yellow	Yellow	Yellow	Blue	Yellow	Yellow	Yellow	Red	Red	Red	Red

Augmentation of natural resource base and its sustainable utilization: Ensuring inter and intra-generational equity

39. Secure integration of biodiversity concerns into inter-sectoral policies and programmes to identify elements having adverse impact on biodiversity and design policy guidelines to address such issues. Make valuation of biodiversity an integral part of pre-appraisal of projects and programmes to minimize adverse impacts on biodiversity	Red	Green	Red									
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LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

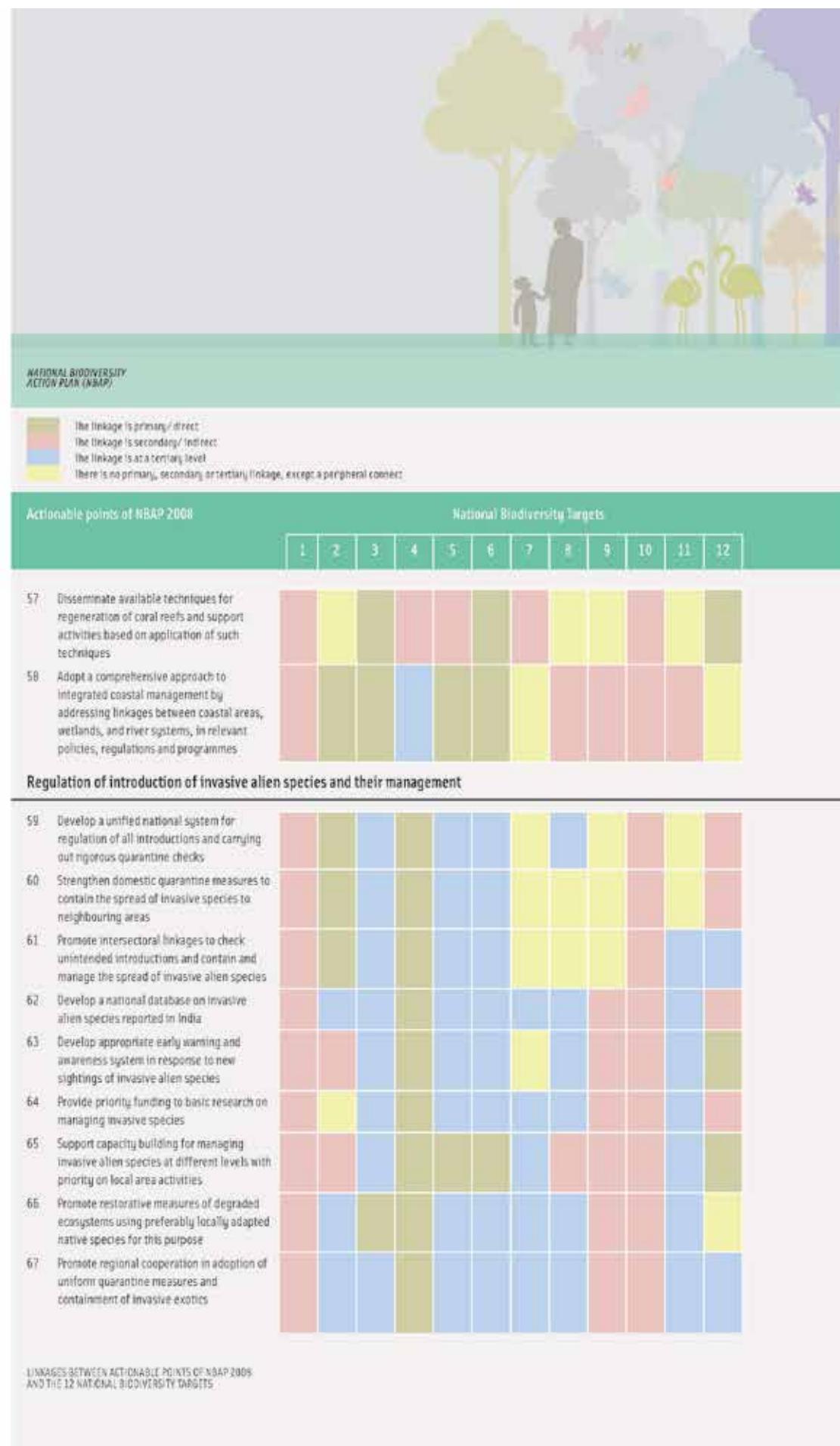


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Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
through research and development, extension of knowledge, pilot scale demonstrations, and large scale dissemination including farmer's training, and where necessary, access to institutional finance												
50 Promote reclamation of wasteland and degraded forest land through formulation and adoption of multi-stakeholder partnerships involving the land owning agency, local communities, and investors												
51 Promote sustainable alternatives to shifting cultivation where it is no longer ecologically viable, ensuring that the culture and social fabric of the local people are not disrupted												
52 Encourage agro-forestry, organic farming, environmentally sustainable cropping patterns, and adoption of efficient irrigation techniques												
53 Incorporate a special component in afforestation programmes for afforestation on the banks and catchments of rivers and reservoirs to prevent soil erosion and improve green cover												
54 Integrate wetland conservation, including conservation of village ponds and tanks, into sectoral development plans for poverty alleviation and livelihood improvement, and link efforts for conservation and sustainable use of wetlands with the ongoing rural infrastructure development and employment generation programmes												
55 Promote traditional techniques and practices for conserving village ponds												
56 Mainstream the sustainable management of mangroves into the forestry sector regulatory regime so as to ensure the protection of coastal belts and conservation of flora and fauna in those areas												

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

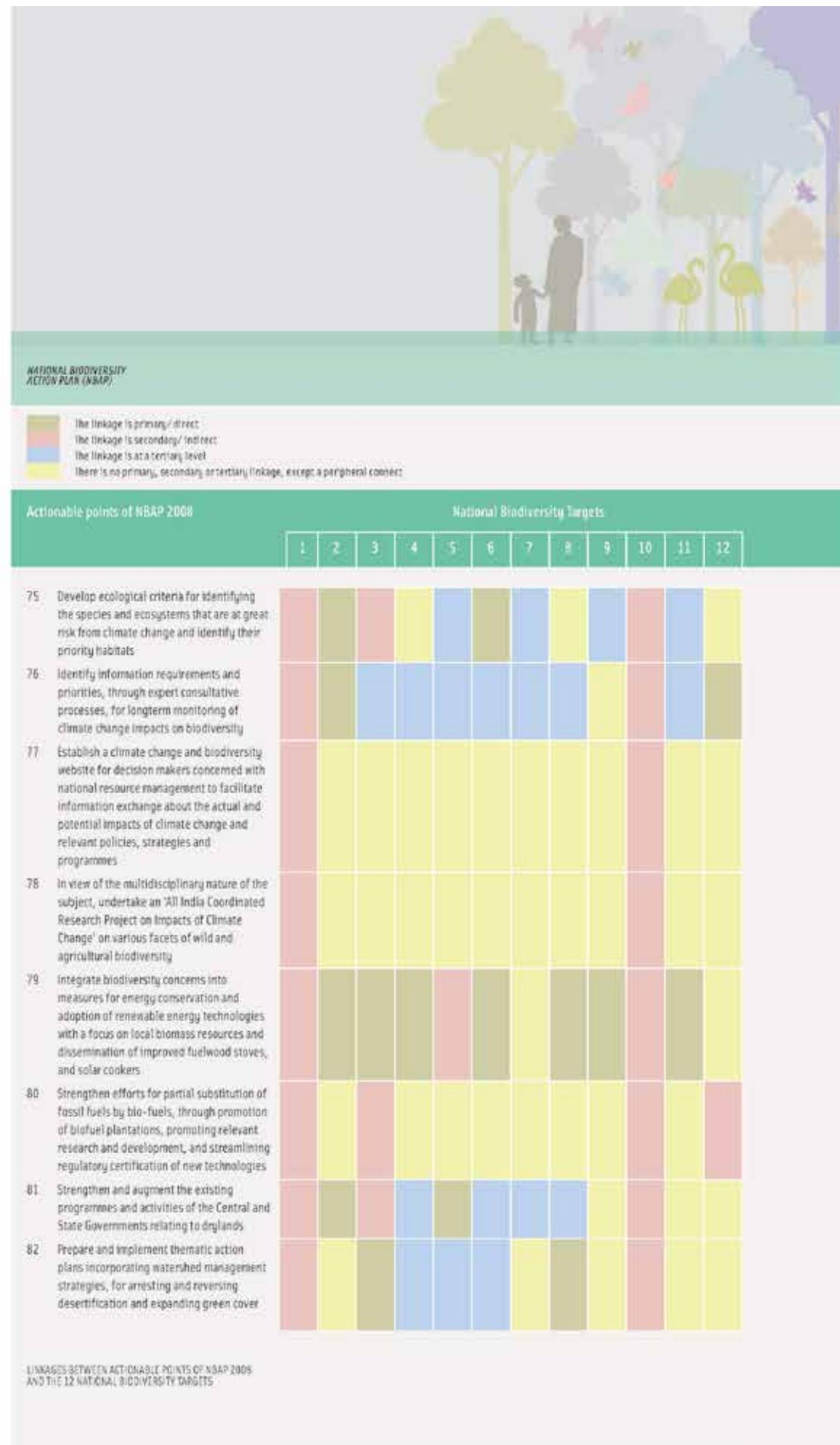


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Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
Assessment of vulnerability and adaptation to climate change, and desertification												
68. Identify the key sectors of the country vulnerable to climate change, in particular impacts on water resources, agriculture, health, coastal areas and forests												
69. Promote research to develop methodologies for tracking changes and assessing impacts of climate change on glaciers, river flows and biodiversity												
70. Assess the need for adaptation to future impacts of climate change at national and local levels, and the scope for incorporating the outputs of such assessments in relevant programmes, including watershed management, coastal zone planning and regulation, agricultural technologies and practices, forestry management, and health programmes												
71. Explicitly consider vulnerability of coastal areas and their biodiversity to climate change and sea level rise in coastal management plans, as well as infrastructure planning and construction norms												
72. Participate in voluntary partnerships with other countries both developed and developing, to address the challenges of sustainable development and climate change, consistent with the provisions of the UNFCCC												
73. Identify the most important gaps in knowledge that limit the national ability to develop and implement climate change adaptation strategies for species, and ecological processes and functions												
74. Enhance the capacity of climate modeling in the country substantially to get clear idea on the impacts of climate change on biodiversity at national and local levels												

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

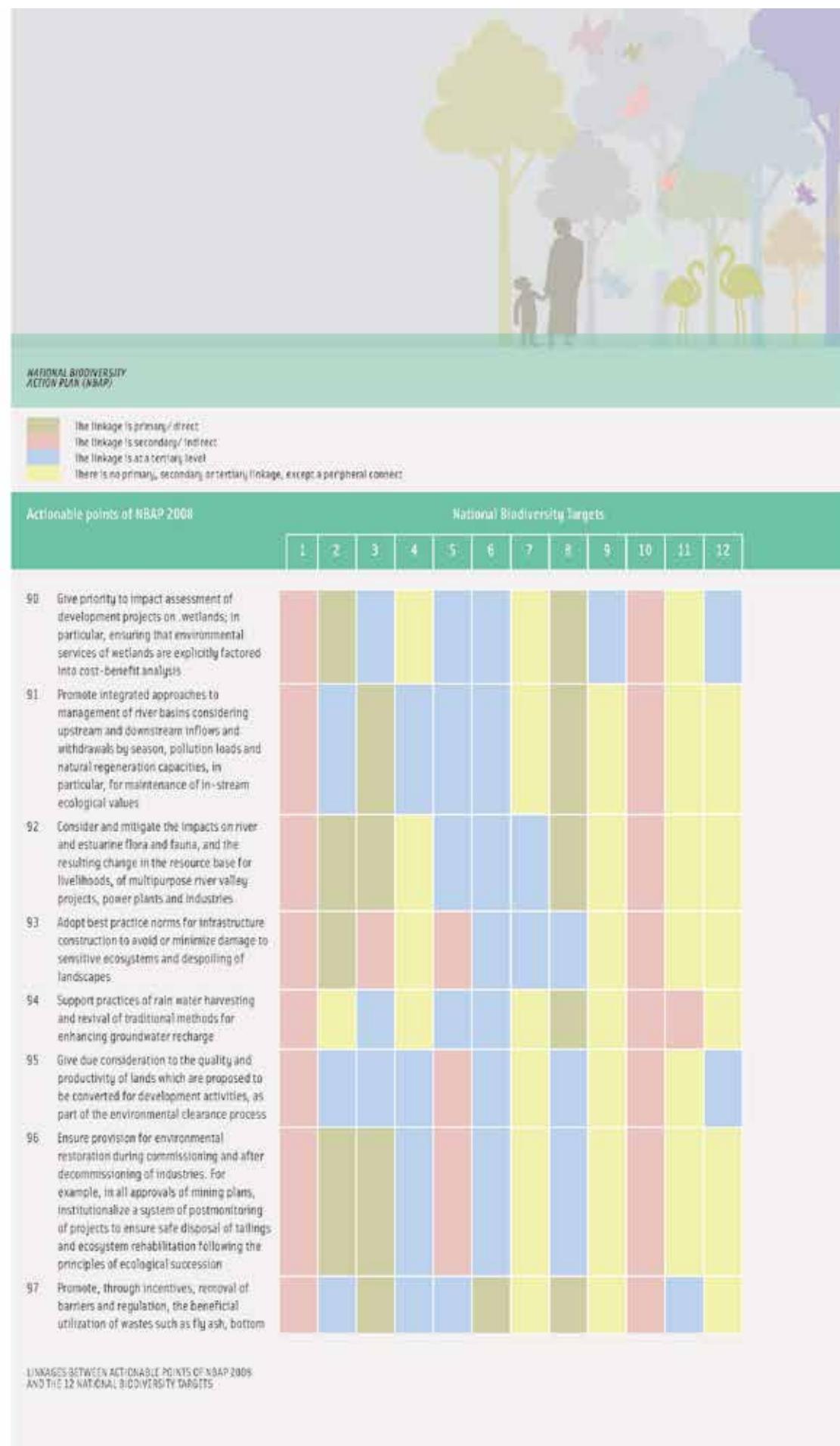


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Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
83. Promote reclamation of wastelands by energy plantations for rural energy through multistakeholder partnerships involving the landowning agencies, local communities, and investors	Red	Blue	Blue	Blue	Blue	Yellow	Yellow	Red	Yellow	Red	Yellow	Yellow
Integration of biodiversity concerns in economic and social development												
84. Develop strong research base on impact assessment and conduct rigorous impact assessment of development projects, with a focus on biodiversity and habitats	Red	Green	Blue	Blue	Blue	Yellow	Blue	Yellow	Red	Yellow	Blue	Blue
85. Integrate biodiversity concerns across development sectors (such as industry, infrastructure, power, mining, etc.) and promote use of clean technologies	Red	Green	Blue	Blue	Blue	Yellow	Blue	Yellow	Red	Yellow	Blue	Blue
86. Accord priority to the potential impacts of development projects on biodiversity resources and natural heritage while undertaking EIA. In particular, ancient sacred groves and biodiversity hotspots should be treated as possessing incomparable values	Red	Green	Blue	Blue	Blue	Yellow	Blue	Yellow	Red	Red	Yellow	Blue
87. Take steps to adopt and institutionalize techniques for environmental assessment of sectoral policies and programmes to address any potential adverse impacts, and enhance potential favourable impacts	Green	Blue	Blue	Blue	Blue	Yellow	Blue	Yellow	Red	Yellow	Yellow	Blue
88. Develop and integrate pre-project plans for reallocation and rehabilitation of local people likely to be displaced by development projects keeping in view their socio-cultural and livelihood needs	Red	Blue	Yellow	Blue	Blue	Yellow	Blue	Yellow	Red	Yellow	Blue	Blue
89. Ensure that in all cases of diversion of forest land, the essential minimum needed land for the project or activity is permitted. Restrict the diversion of dense natural forests, particularly areas of high endemism of genetic resources, to non-forest purposes, only to site-specific cases of vital national interest	Red	Blue	Yellow	Red	Blue	Blue	Blue	Yellow	Red	Yellow	Blue	Blue

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

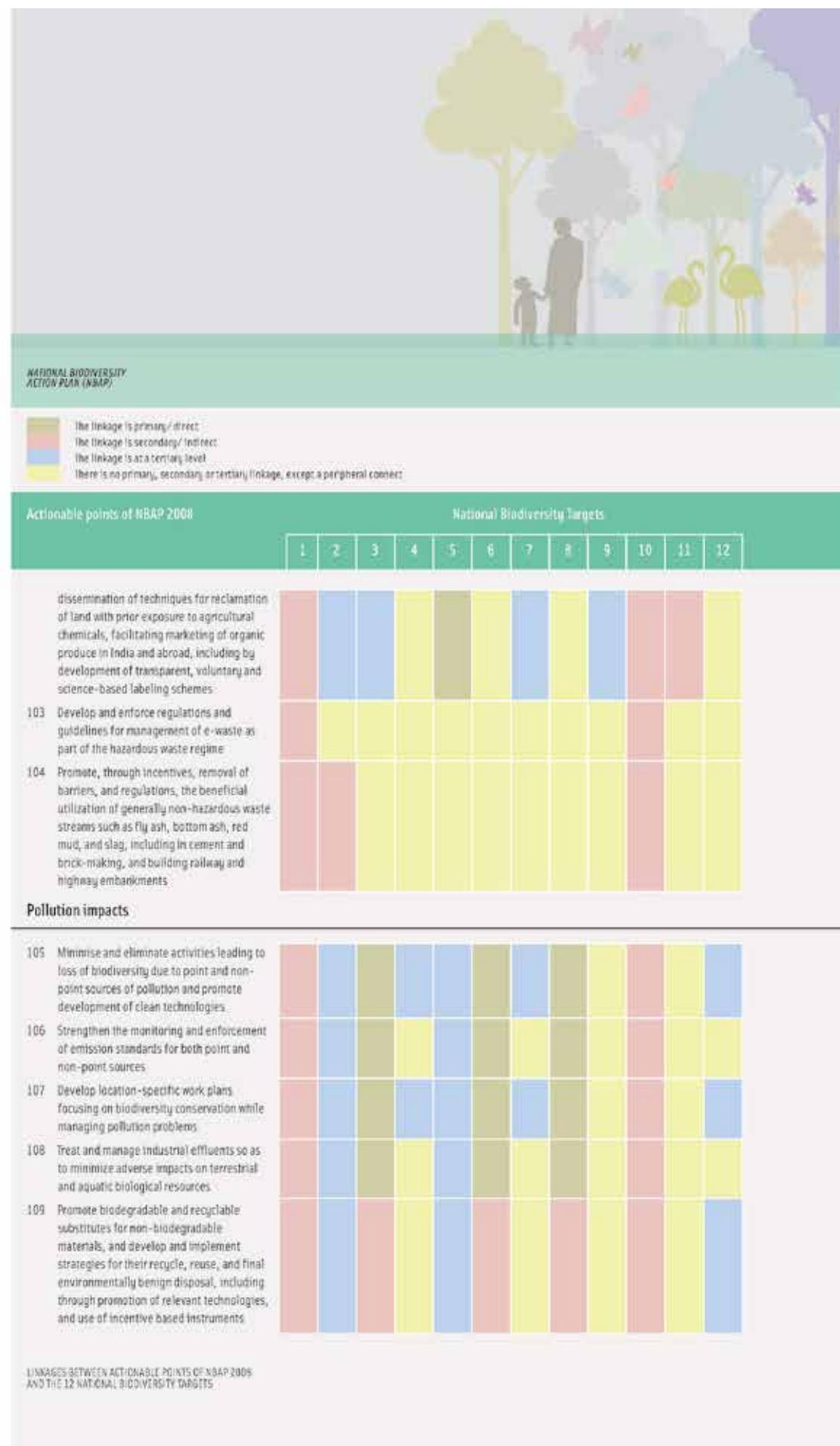


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Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
ash, red mud, and slag, minimizing thereby their adverse impacts on terrestrial and aquatic ecosystems.												
98 Promote sustainable tourism through adoption of best practice norms for tourism facilities and conservation of natural resources while encouraging multistakeholder partnerships favouring local communities												
99 Develop and implement viable models of public-private partnerships for setting up and operating secure landfills, incinerators, and other appropriate techniques for the treatment and disposal of toxic and hazardous wastes, both industrial and biomedical, on payment by users, taking the concerns of local communities into account. The concerned local communities and State Governments must have clear entitlements to specified benefits from hosting such sites, if access is given to non-local users. Develop and implement strategies for clean-up of toxic and hazardous waste dump legacies, in particular in industrial areas, and abandoned mines, and reclamation of such lands for future, sustainable use												
100 Survey and develop a national inventory of toxic and hazardous waste dumps, and an online monitoring system for movement of hazardous wastes. Strengthen capacity of institutions responsible for monitoring and enforcement in respect of toxic and hazardous wastes												
101 Strengthen the legal arrangements and response measures for addressing emergencies arising out of transportation, handling and disposal of hazardous wastes as part of the chemical accidents regime												
102 Promote organic farming of traditional crop varieties through research in and												

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008 AND THE 12 NATIONAL BIODIVERSITY TARGETS



ADDENDUM 2014
TO NBAP 2008

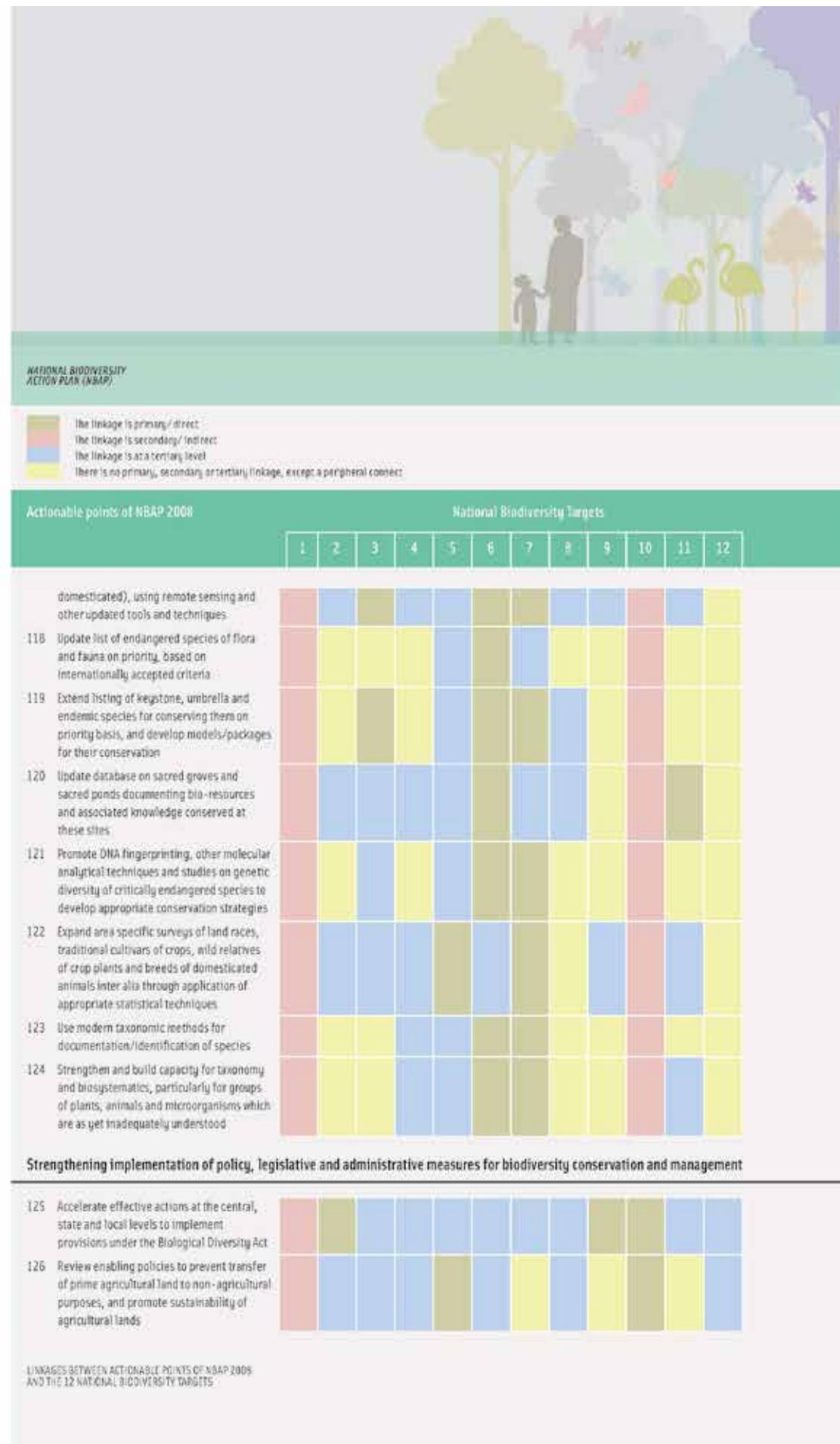
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Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
110 Avoid excessive use of fertilizers, pesticides and insecticides while encouraging integrated pest management practices, and use of organic manures and biofertilisers												
111 Promote organic farming of locally adapted and traditional crop varieties through appropriate incentives, and direct access to markets duly supported by credible certification systems												
112 Develop a strategy for strengthening regulation, and addressing impacts, of ship-breaking activities on human health, coastal and near marine bioresources												
113 Accord priority to potential impacts on designated natural heritage sites in view of their incomparable values that merit stricter standards than in otherwise comparable situations												
114 Promote R&D on impacts of air, water and soil pollution on biodiversity and use of biological methods for pollution amelioration												

Development and integration of biodiversity databases

115 Develop an integrated national biodiversity information system with distributive linkages for easy storage, retrieval and dissemination including through augmentation of extant efforts of spatial mapping of natural resources and development of interactive databases at national level												
116 Intensify survey, identification and inventorization activities, involving local institutions and giving priority to hitherto unexplored areas												
117 Conduct regular surveys to monitor changes in populations of target species (wild and												

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

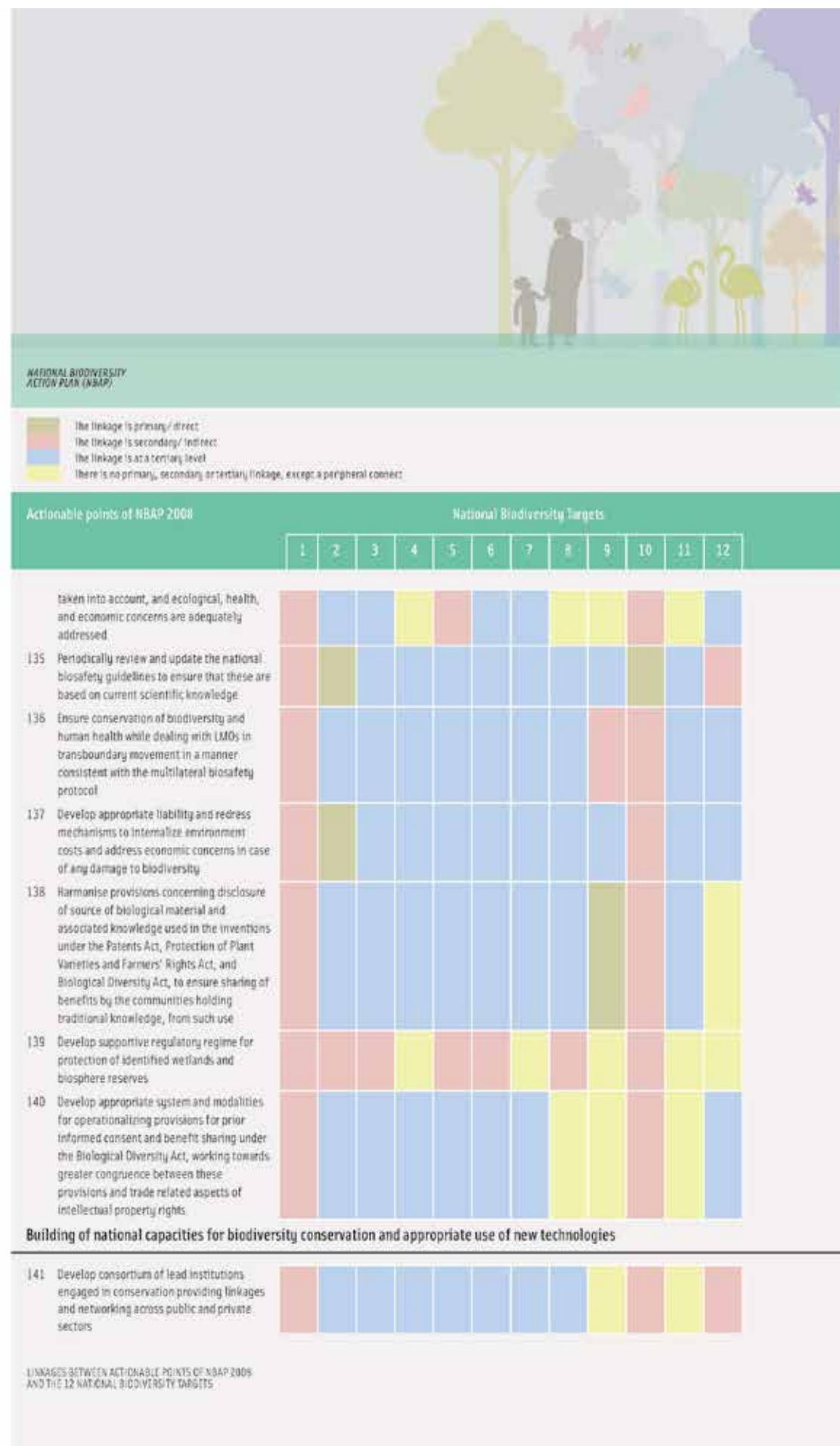


ADDENDUM 2014
TO NBAP 2008

- The linkage is primary/direct
- The linkage is secondary/indirect
- The linkage is at a tertiary level
- There is no primary, secondary or tertiary linkage, except a peripheral connect

Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
127 Formulate suggestive policies for strengthening and supporting conservation and management of grasslands, pastoral lands, sacred groves and other areas significant for biodiversity conservation	Red	Blue	Yellow	Blue	Blue	Yellow	Yellow	Yellow	Red	Red	Blue	Blue
128 Support preparation of PBRs with technical help by the scientific institutions	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Red	Yellow	Yellow	Blue
129 Strengthen systems for documentation, application and protection of biodiversity associated traditional knowledge, providing adequate protection to these knowledge systems while encouraging benefits to communities	Red	Blue	Blue	Blue	Blue	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Blue
130 Revive and revitalize sustainable traditional practices and other folk uses of components of biodiversity and associated benefits to local communities with a view to promoting and strengthening traditional knowledge and practices	Red	Blue	Blue	Blue	Blue	Yellow	Blue	Red	Yellow	Yellow	Yellow	Blue
131 Create public education and awareness about the need to conserve, protect and gainfully use traditional knowledge systems	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Red	Yellow	Yellow	Red	Blue
132 Identify emerging areas for new legislation, based on better scientific understanding, economic and social development, and development of multilateral environmental regimes, in line with the NEP	Red	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Red	Blue
133 Review the body of existing legislations relevant to biodiversity conservation to develop synergies among relevant statutes and regulations, eliminate obsolescence, and amalgamate provisions with similar objectives, in line with the NEP. Further, encourage and facilitate review of legislations at the level of state and local governments with a view to ensuring their consistency with this policy	Red	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Blue	Blue
134 Review the regulatory processes for LMDs so that all relevant scientific knowledge is	Red	Blue	Blue	Yellow	Red	Blue	Yellow	Red	Yellow	Blue	Blue	Blue

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS



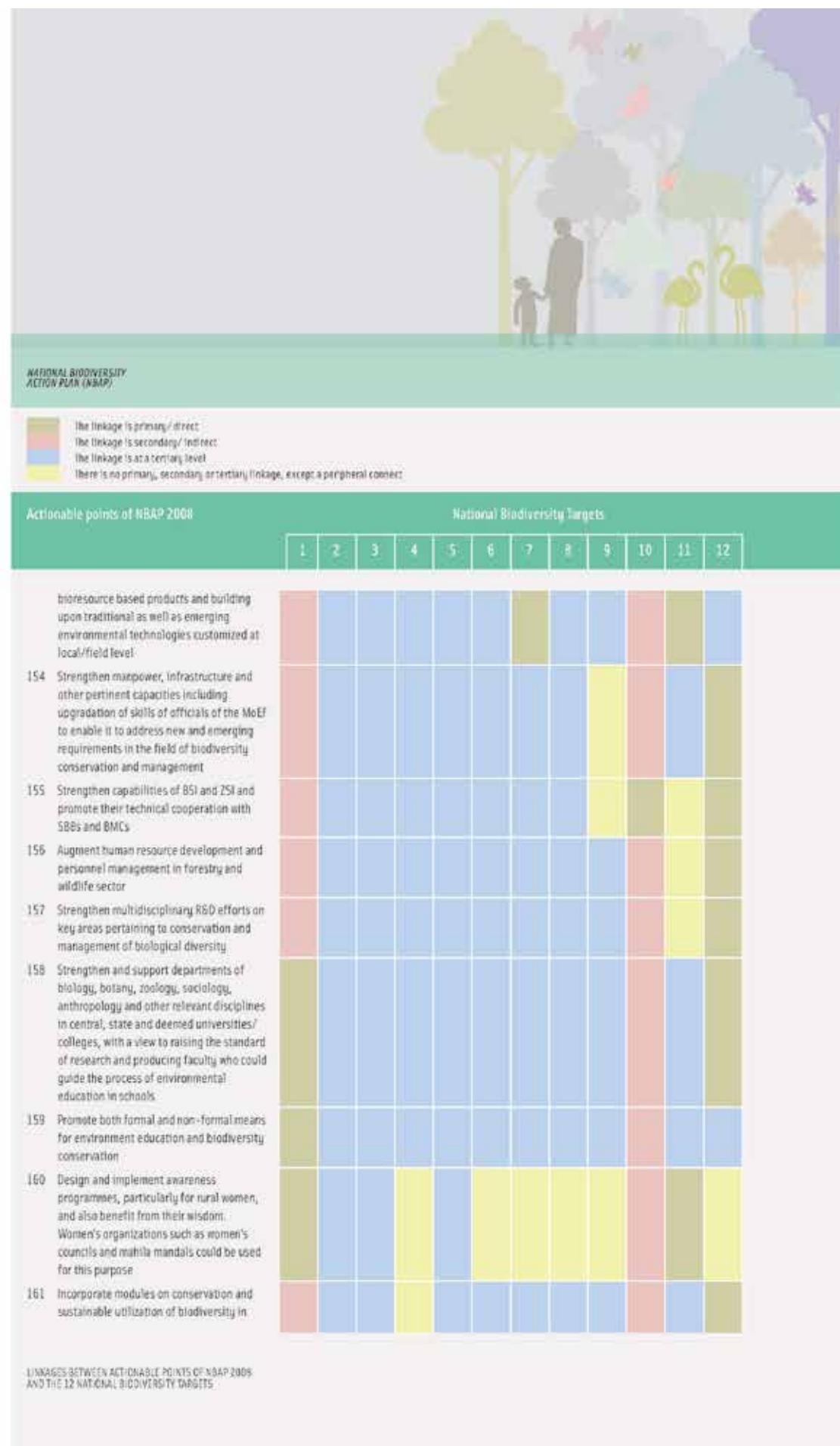
ADDENDUM 2014
TO NBAP 2008

- The linkage is primary/direct
- The linkage is secondary/indirect
- The linkage is at a tertiary level
- There is no primary, secondary or tertiary linkage, except a peripheral connect

Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
142. Outsource research and promote joint ventures on key conservation issues	Red	Blue								Red	Blue	Red
143. Promote application of biotechnology tools for conserving endangered species	Red	Yellow	Yellow	Blue	Red	Yellow	Blue	Yellow	Red	Yellow	Red	Yellow
144. Encourage DNA profiling for assessment of genetic diversity in endangered species to assist conservation	Red	Yellow	Yellow	Blue	Red	Yellow	Blue	Yellow	Red	Yellow	Red	Yellow
145. Develop DNA-probe based technology for tracking of LMOs	Red	Yellow	Yellow	Blue	Red	Yellow	Blue	Yellow	Red	Yellow	Red	Yellow
146. Develop specific pilot gene banks for LMOs approved for undertaking research and commercial use	Red	Yellow	Yellow	Blue	Red	Yellow	Blue	Yellow	Red	Yellow	Red	Yellow
147. Develop capacity for risk assessment, management and communication on LMOs	Blue	Yellow	Yellow	Blue	Red	Yellow	Blue	Yellow	Red	Yellow	Red	Yellow
148. Support pilot studies on use of biotechnology tools for conservation where appropriate	Red	Blue	Blue	Red	Blue	Red	Blue	Red	Blue	Red	Blue	Red
149. Develop specific complimentary capacity building measures based on national needs and priorities for the formulation and implementation of national rules and procedures on liability and redress to strengthen the establishment of baseline information and monitoring of changes	Red	Blue	Blue	Red	Blue	Red	Blue	Red	Blue	Red	Blue	Red
150. Develop protocols for monitoring products based on genetic use restriction technologies	Red	Blue	Blue	Red	Blue	Red	Blue	Red	Blue	Red	Blue	Red
151. Strengthen participatory appraisal techniques and encourage formation of local institutional structures for planning and management of natural resources for ensuring participation of women	Red	Blue	Blue	Red	Blue	Red	Blue	Red	Blue	Red	Blue	Red
152. Preserve and strengthen traditional, religious, ritualistic, ethical and cultural methods of conservation	Red	Blue	Blue	Red	Blue	Red	Blue	Red	Blue	Red	Blue	Red
153. Promote livelihood diversification opportunities for making value added	Red	Blue	Blue	Red	Blue	Red	Blue	Red	Blue	Red	Blue	Red

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS

52



ADDENDUM 2014
TO NBAP 2008

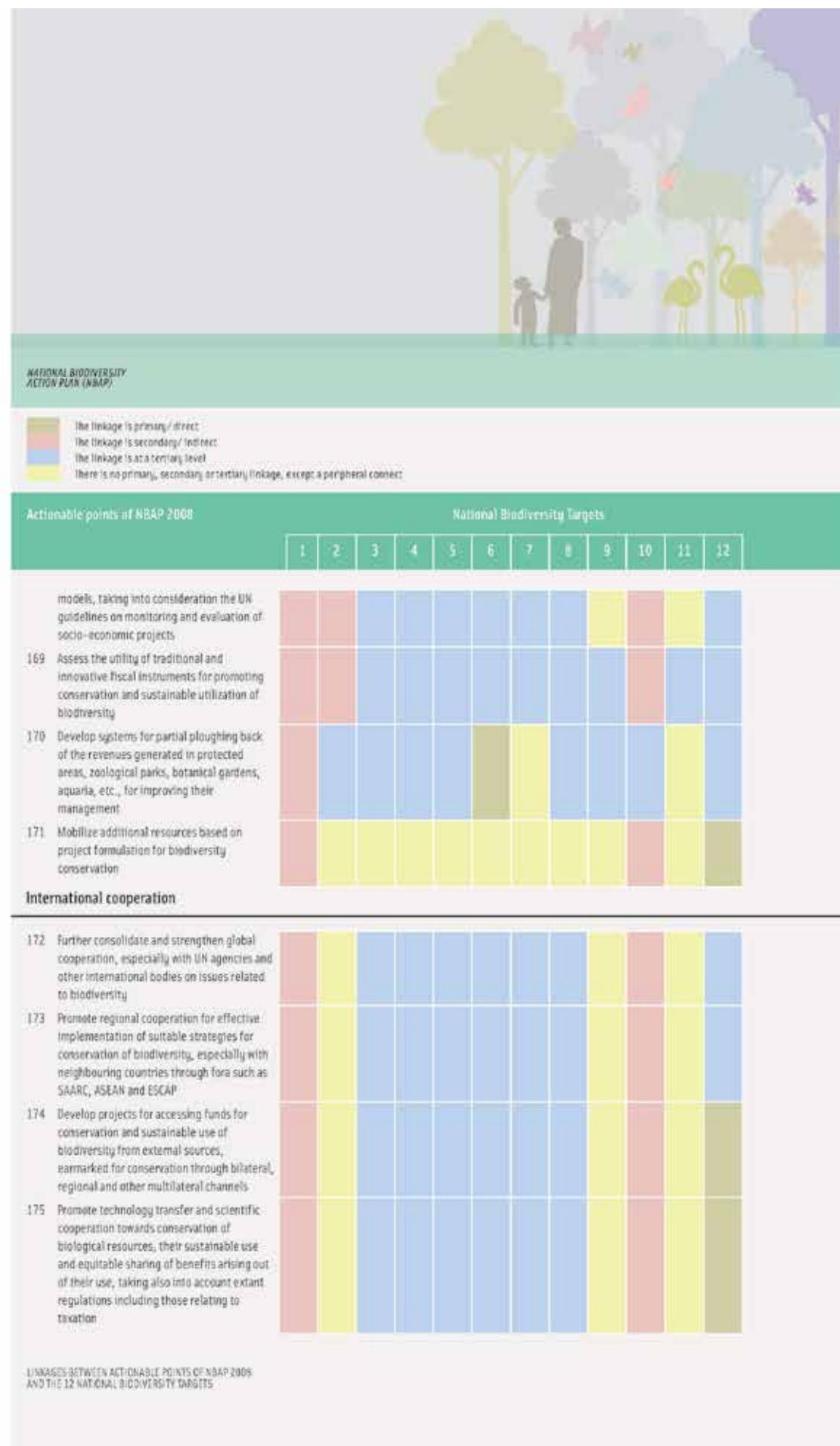
- The linkage is primary/direct
- The linkage is secondary/indirect
- The linkage is at a tertiary level
- There is no primary, secondary or tertiary linkage, except a peripheral connect

Actionable points of NBAP 2008	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
162. Foundational and professional training courses for the officers of various services.	Red	Blue	Blue	Yellow	Blue	Blue	Blue	Blue	Red	Blue	Blue	Yellow
162. Promote and/or strengthen education, training, awareness and extension programmes on biodiversity issues for various stakeholders including all levels of students, professionals (such as engineers, doctors, lawyers, CAs, etc.), elected representatives (such as representatives of PRIs, MLAs, MPs, Mayors, etc.), judiciary, NGOs, public and private sectors (e.g. corporate representatives, industrial associations etc.), defence and para military forces, customs, police, media, cultural, spiritual and religious institutions/ individuals	Green											
163. Enhance public education and awareness for biodiversity conservation through audio, visual and print media	Green								Red	Blue	Blue	
164. Promote activities relating to animal welfare	Green								Red	Blue	Blue	

Valuation of goods and services provided by biodiversity, and use of economic instruments in decision making processes

165. Develop a system of natural resource accounting reflecting the ecological as well as economic values of biodiversity, with special attention to techniques of green accounting in national accounts and estimation of positive and negative externalities for use of various types of natural resources in the production processes as well as in household and government consumption	Red	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Red	Blue	Blue	
166. Develop suitable valuation models for adoption at national, state and local levels	Red	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Red	Yellow	Blue	
167. Support projects and pilot studies aimed at validating methods of valuation of bioreources	Red	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Red	Yellow	Blue	
168. Identify key factors and indicators to assess effectiveness of valuation methods and	Red	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Red	Yellow	Blue	

LINKAGES BETWEEN ACTIONABLE POINTS OF NBAP 2008
AND THE 12 NATIONAL BIODIVERSITY TARGETS



FUNDING FOR BIODIVERSITY CONSERVATION AND ALLOCATIONS CONTRIBUTING TOWARDS ACHIEVEMENT OF NATIONAL BIODIVERSITY TARGETS

1.7

ADDENDUM 2014
TO NBAP 2008

Resource flows to the biodiversity sector include direct core funding and non-core funding (that originates from the budgetary resources of the MoEF); indirect peripheral funding, which comprises development budgetary resources that are allocated by other scientific and development Ministries/Departments of the GoI towards programmes that have a bearing on biodiversity conservation; and funding by the State Governments on biodiversity and environment. The MoEF undertook an assessment of funding for biodiversity conservation for the year 2010–2011 in which funding for core (direct and immediate biodiversity impact of MoEF programmes/schemes), net non-core (indirect), and net peripheral funding flows (from biodiversity relevant 29 schemes of seven Ministries/Departments other than MoEF), along with core funding by the State Governments was assessed (MoEF 2012 b). Building on this study and using similar methodology, an assessment was conducted for 2013–2014 that included expanded datasets based on peripheral funding related to 77 schemes of 23 Ministries/Departments of the GoI (MoEF 2014).

In the context of Strategic Goal E and Aichi Biodiversity Target 20 relating to resource mobilization, and keeping into consideration the call to Parties for providing data on resource mobilization according to the Indicators adopted in CoP decision X/3, activities have been classified into those that are directly related to biodiversity and others that are indirectly related to biodiversity for assessing funding for biodiversity conservation. Funding for activities directly related to biodiversity include activities taken up for *in situ*/*ex situ* conservation, for protected areas, for maintaining genetic diversity and for addressing threats to specific ecosystems and/or species. Funding considered under this category is generally provided by environmental agencies that directly and purposely consider biodiversity within their mandates. Activities that have benefits for biodiversity but for which biodiversity conservation and sustainable use are not the main focus are considered to bear an indirect relation with regard to funding for biodiversity conservation. The total estimated funding for biodiversity conservation during 2013–2014 (including core, non-core and peripheral funding for biodiversity conservation) is provided in Table 3. As explained in the foregoing, peripheral funding pertains to funding related to biodiversity conservation under 77 schemes and programmes of 23 Ministries/ Departments of the GoI other than the MoEF.

Table 3. Core, non-core and peripheral funding for biodiversity conservation in 2013–2014

Nature of funding	Amount (₹ in crores)
Core	1564.34
Non-core	259.8
Core + non-core	1824.14
States	5025.57
Peripheral	₹ 2354.74 (23 Ministries, 77 schemes)
Total	₹ 9204.45 crores or USD 1482.68 million (at 1150 : ₹ 62.08 in February 2014).

The allocations of funding for biodiversity conservation for activities that are contributing towards achieving the 12 NBTs have been explored below (Figures 1, 2, 3) with regard to core, non-core funding of MoEF and peripheral funding related to 23 Ministries.

CORE AND NON-CORE FUNDING FOR BIODIVERSITY CONSERVATION: MOEF BUDGET ALLOCATION VIS-À-VIS NATIONAL BIODIVERSITY TARGETS

1.7.1

NATIONAL BIODIVERSITY
ACTION PLAN (NBAP)

MoEF in 2013-14 had allocated a sum of ₹ 1824.14 crores towards biodiversity conservation of which 1564.34 crores and 259.8 crores formed core and non-core funding, respectively. In early 2014, MoEF formulated 12 NBTs (MoEF 2014). An effort has been made to work out the relative allocation of the overall MoEF funding for biodiversity conservation contributing towards each of the 12 NBTs (Figure 1).

The highest allocation works out to be for NBT 6, followed by NBT 1, and NBT 3, while the lowest allocation is for NBT 7 followed by that for NBT 4. The highest allocation for NBT 6 results due to the fact that within the overall budget of the MoEF, a substantial part of the budgetary allocation is under "Forestry and Wildlife" wherein the funds contribute strongly towards activities envisaged under NBT 6. The next highest allocation contributing towards achieving NBT 1 is due to the fact that a large number of MoEF institutions and Centres of Excellence are creating information and are helping in generating awareness on environment and biodiversity conservation. The high allocation for NBT 3 is owing to the allocation for programmes and activities that prevent habitat loss and fragmentation and support afforestation and ecological restoration. Although MoEF allocation for NBT 4 works out to be low, there are other Ministries in GoI, particularly Ministry of Agriculture and Ministry of Earth Sciences, which have programmes/ schemes for dealing with invasive species. Similarly, MoEF allocations for NBT 7 have emerged to be low since activities under NBT 7 fall within the purview of the Ministry of Agriculture, specifically the five national bureaus, namely, National Bureau of Plant Genetic Resources (NBPGR), National Bureau of Animal Genetic Resources (NBAGR), National Bureau of Agriculturally Important Microorganisms (NBAIM), National Bureau of Agriculturally Important Insects (NBAlI), and National Bureau of Fish Genetic Resources (NBFGR), which are carrying out activities that contribute to achieving NBT 7.

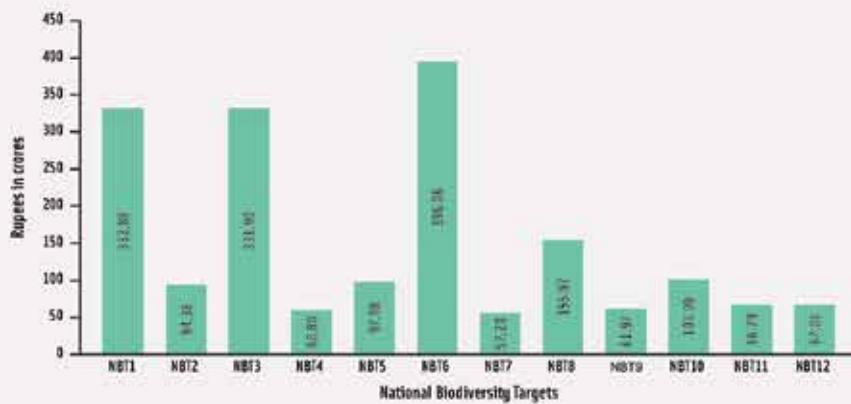


Figure 1. MoEF budget allocation (2013-2014) that contributes towards NBTs

CORE AND NON-CORE FUNDING FOR BIODIVERSITY CONSERVATION:
MOEF BUDGET ALLOCATION VIS-À-VIS NATIONAL BIODIVERSITY TARGETS

PERIPHERAL FUNDING FOR BIODIVERSITY CONSERVATION: 23 MINISTRIES VIS-À-VIS NATIONAL BIODIVERSITY TARGETS

1.7.2

ADDENDUM 2014
TO NBAP 2008

Of the 23 Ministries that have been identified as contributing towards peripheral funding for biodiversity conservation, the allocations of MoRD and MoDWS constitute the highest proportion of funding (as MoRD and MoDWS allocations are several times higher than the rest of the 21 Ministries, these have not been depicted graphically in Figure 2). This is due to the overall high allocations of the schemes of MoRD and MoDWS that contribute to biodiversity conservation in peripheral or indirect ways. The allocations of MoRD particularly contribute towards NBT 2. The allocation of the MoDWS schemes contribute towards activities envisaged under NBT 5.

Of the remaining 21 Ministries (Table 4), the allocations are highest towards NBT 12, followed by NBT 10 and NBT 2 while the lowest three allocations are for NBT 1 followed by NBT 7 and NBT 6 (Figure 2).

Table 4. Indicative list of Ministries/Departments and National Biodiversity Targets for Implementation of the National Biodiversity Action Plan

Ministries/Departments of Government of India and Planning Commission	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of Agriculture (MoA)	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of Chemicals and Fertilizers (MoCF)	3	4	5	6	7	8	9	10	11	12		
Ministry of Coal (MoC)	3	4	5	6	7	8	9	10	11	12		
Ministry of Commerce and Industry (MoCI)	2	3	5	7	8	9	10	12				
Ministry of Drinking Water and Sanitation (MoDWS)	3	4	5	6	9	10	11	12				
Ministry of Earth Sciences (MoES)	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of Environment and Forests (MoEF)	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of Health and Family Welfare (MoHFW)	1	3	4	5	6	9	10	11	12			
Ministry of Human Resource Development (MoHRD)	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of New and Renewable Energy (MoNRE)	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of Panchayati Raj (MoPR)	1	3	4	5	6	7	8	9	10	11	12	
Ministry of Petroleum and Natural Gas (MoPNG)	3	4	5	6	7	8	9	10	12			
Ministry of Power (MoP)	2	3	4	5	6	7	8	9	10	12		
Ministry of Rural Development (MoRD)	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of Science and Technology (MoST)	1	2	3	4	5	6	7	8	9	10	11	12
Ministry of Shipping (MoS)	3	4	6	7	8	9	10	12				
Ministry of Tourism (MoT)	3	4	5	6	7	8	9	10	11	12		
Ministry of Tribal Affairs (MoTA)	1	2	3	4	5	6	7	8	9	10	11	12

PERIPHERAL FUNDING FOR BIODIVERSITY CONSERVATION:
23 MINISTRIES VIS-À-VIS NATIONAL BIODIVERSITY TARGETS



Figure 2. Budget allocations (2013-2014) of 21 Ministries of GoI (excluding MoRD and MoDWS) that contribute towards NBTs

COMBINED ALLOCATIONS FOR BIODIVERSITY CONSERVATION: MOEF AND 23 MINISTRIES VIS-À-VIS NATIONAL BIODIVERSITY TARGETS

1.7.3

ADDENDUM 2014
TO NBAP 2008

Of the combined allocations of all 24 Ministries including MoEF for biodiversity conservation, maximum funds allocated contribute towards NBT 3 followed by NBT 8 and NBT 10, while the lowest allocations are towards NBT 7 followed by NBT 4 (Figure 3).



Figure 3. Combined allocation of funds (2013-2014) of MoEF and 23 Ministries/ Departments of GoI that contribute towards NBTs

COMBINED ALLOCATIONS FOR BIODIVERSITY CONSERVATION:
MOEF AND 23 MINISTRIES VIS-À-VIS NATIONAL BIODIVERSITY TARGETS

60

PROGRAMME OF WORK ON PROTECTED AREAS: LINKAGES WITH NATIONAL BIODIVERSITY ACTION PLAN AND NATIONAL BIODIVERSITY TARGETS

1.8

NATIONAL BIODIVERSITY ACTION PLAN (NBAP)

The CBD vide CoP-7 Decision VII/28 established PoWPA with the overall purpose to support the establishment and maintenance by 2010 for terrestrial and by 2012 for marine areas of comprehensive, effectively managed, and ecologically representative national and regional systems of protected areas that collectively, *inter alia*, through a global network contribute to achieving the three objectives of the Convention and the 2010 target to significantly reduce the current rate of biodiversity loss at the global, regional, national and sub-national levels and contribute to poverty reduction and the pursuit of sustainable development, thereby supporting the objectives of the Strategic Plan of the Convention, the World Summit on Sustainable Development Plan of implementation and the Millennium Development Goals.

The PoWPA was developed bearing in mind the need to avoid unnecessary duplication with existing thematic work programmes and other ongoing initiatives of the CBD, and to promote synergy and coordination with relevant programmes of various international organizations. It consists of the following four interlinked elements intended to be mutually reinforcing and cross-cutting in their implementation:

- 1) Direct actions for planning, selecting, establishing, strengthening, and managing, protected area systems and sites.
- 2) Governance, participation, equity and benefit sharing.
- 3) Enabling activities.
- 4) Standards, assessment, and monitoring.

In pursuance to CoP-10 decision X/31 requesting Parties to submit action plans for the implementation of the PoWPA, India prepared and submitted PoWPA action plan (www.cbd.int/database/attachment/?id=1551).

In line with paragraph 1 (c) of decision X/31, the CoP urged Parties to integrate national PoWPAs into updated NBSAPs, which, in accordance with paragraphs 3 (c) and (d) of decision X/2, should be adopted as policy instruments and used as a primary framework for implementation and as the basis for securing the necessary financial support, including from national budgets and from bilateral, multilateral and other sources.

The linkages between India's action plan for PoWPA implementation and the action points under India's NBAP 2008 accordingly are shown in Table 5.





Table 5. Linkages between India's action points for PoWPA implementation and action points of NBAP 2008

Action Points under PoWPA Implementation Plan (India)	NBAP 2008 Action Points										
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Development of site specific management plan	■	■	■	■	■	■	■	■	■	■	■
Integration of Protected Areas (PA) (securing identified corridors and connectivity areas)	■	■	■	■	■	■	■	■	■	■	■
Diversifying the governance types	■	■	■	■	■	■	■	■	■	■	■
PA valuation assessment	■	■	■	■	■	■	■	■	■	■	■
Climate change resilience and adaptation assessment	■	■	■	■	■	■	■	■	■	■	■

■ The linkage is primary/ direct ■ The linkage is secondary/ Indirect

As can be seen from Table 5, the action points under India's plan for PoWPA implementation demonstrate convergence with all NBAP 2008 action points. However, linkages of PoWPA implementation action points under "Diversifying the governance types" and "PA valuation assessments" with NBAP 2008 action points are currently indirect and need to be strengthened.

The linkages between India's action plan for PoWPA implementation and the 12 NBTs is shown in Table 6.

Table 6. Linkages between India's action points for PoWPA implementation and 12 NBTs

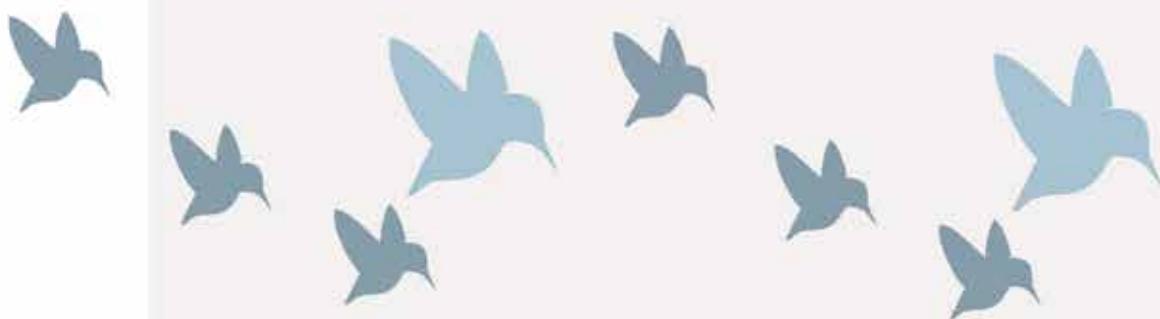
Action Points under PoWPA Implementation Plan (India)	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
Development of site specific management plan	■	■	■	■	■	■	■	■	■	■	■	■
Integration of Protected Areas (PA) (securing identified corridors and connectivity areas)	■	■	■	■	■	■	■	■	■	■	■	■
Diversifying the governance types	■	■	■	■	■	■	■	■	■	■	■	■
PA valuation assessment	■	■	■	■	■	■	■	■	■	■	■	■
Climate change resilience and adaptation assessment	■	■	■	■	■	■	■	■	■	■	■	■

■ The linkage is primary/ direct ■ The linkage is secondary/ Indirect



NATIONAL BIODIVERSITY
ACTION PLAN (NABP)

Since PoWPA is directly related to Aichi Biodiversity Target 11 and NBT 6, there is strong convergence between India's PoWPA implementation plan and NBT 6, as indicated in Table 6. The first action point under India's PoWPA implementation plan on "Development of site-specific management plans" incorporates aspects related to both Aichi Biodiversity Target 9 and NBT 4 on invasive species management. However, there is a need to strengthen convergence between this first action point for PoWPA implementation and NBT 4. There is also a need for building stronger linkages of the NBTs with action points under PoWPA implementation for "PA valuation assessment" and "Climate change resilience and adaptation assessment". The funding support for programmes and activities that show strong linkages between PoWPA implementation will have to be continued and where the linkages are as yet indirect, more funding resources will have to be allocated.



LINKAGES BETWEEN NATIONAL BIODIVERSITY ACTION PLAN, NATIONAL BIODIVERSITY TARGETS AND GLOBAL STRATEGY FOR PLANT CONSERVATION

1.9

ADDENDUM 2014
TO NBAP 2008

Recognizing the critical role of plants in supporting ecosystem resilience, provision of ecosystem services, adapting to and mitigating environmental challenges, and for supporting human well being, CoP-10 adopted the consolidated update of Global Strategy for Plant Conservation (GSPC) in 2010, including the 16 outcome-oriented global targets, the implementation of which is to be pursued as a part of the broader framework of the SP (see Appendix II). These targets range from protecting threatened species to ensuring that plant products are taken from sources which are sustainably managed. Implementing the GSPC will contribute to meeting the goal to reduce significantly the rate of biodiversity loss. The linkages between GSPC Targets and the action points under India's NBAP 2008 are shown in Table 7.

Table 7. Linkages between GSPC Targets and NBAP 2008 Action Points

Global Strategy for Plant Conservation Targets	NBAP 2008 Action Points										
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

The linkage is primary/ direct The linkage is secondary/ indirect

As indicated in Table 7, the action points under NBAP 2008 demonstrate convergence with all the targets of GSPC. In particular, Action Point I of NBAP 2008, namely "Strengthening and integration of *in situ*, on farm and *ex situ* conservation", is strongly linked with the GSPC targets.

The linkages between GSPC Targets and the 12 NBTs are shown in Table 8.



Table 8. Linkages between GSPC Targets and 12 National Biodiversity Targets.

Global Strategy for Plant Conservation Targets	National Biodiversity Targets											
	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												

The linkage is primary/ direct
 The linkage is secondary/ indirect

India's NBTs and the GSPC targets have linkages which are strong in relation to several aspects (as indicated in Table 8) particularly in case of GSPC target 4 ("At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration"), target 5 ("At least 75 per cent of the most important areas for plant diversity of each ecological region protected, with effective management in place for conserving plants and their genetic diversity"), and target 7 ("At least 75 per cent of known threatened plant species conserved *in situ*"), which bear strong convergence with NBTs. NBT 6, which pertains to species conservation and area-based measures and their effective and equitable management, and NBT 11, pertaining to protection and promotion of traditional knowledge, bear important direct linkages with the GSPC targets. Opportunities for building stronger convergence need to be explored and supported where the inter-linkages are indirect.

IMPLEMENTATION OF NATIONAL BIODIVERSITY ACTION PLAN

1.10

ADDENDUM 2014
TO NBAP 2008

The road map for implementation of the NBAP and for achieving the NBTs involves the MoEF and 23 Ministries/Departments of the GoI that have been identified (Table 4), the National Biodiversity Authority (NBA), State Biodiversity Boards (SBBs), Biodiversity Management Committees (BMCs), State Forest Departments (SFDs), State Planning Boards and the relevant Departments of State Governments such as Fisheries, Forests, Agriculture, Livestock and Animal Husbandry, Mining and Education. Local-level institutions, including BMCs, Forest Rights Committees (FRCs), Village Ecodevelopment Committees (VEDCs), Joint Forest Management Committees (JFMCs) and Gram Sabhas (village assemblies) are crucial for implementation of the NBAP. A multi-tier mechanism for implementation as depicted in Figure 4 will be used.

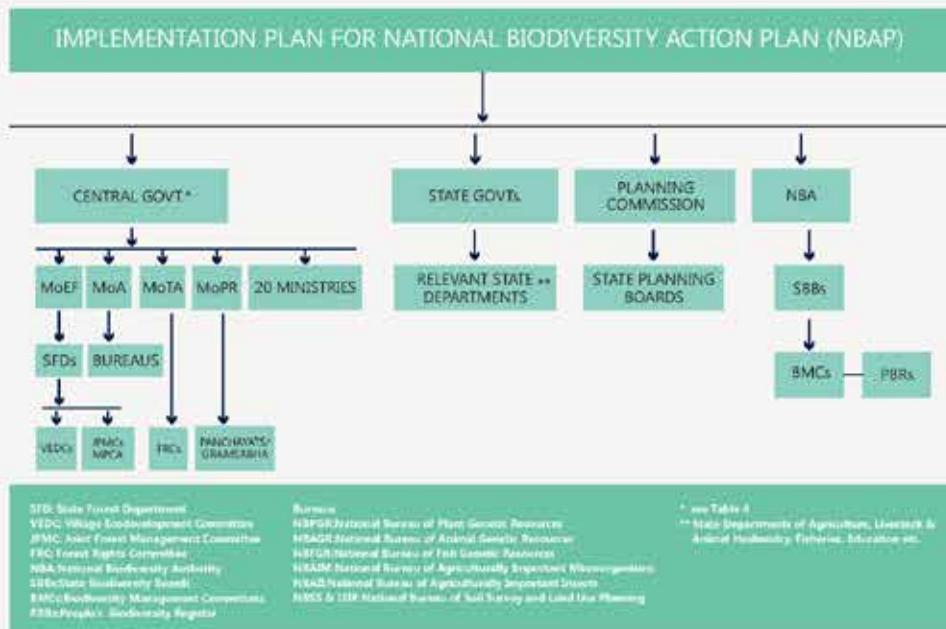


Figure 4. Implementation plan for NBAP



NATIONAL BIODIVERSITY ACTION PLAN (NBAP)

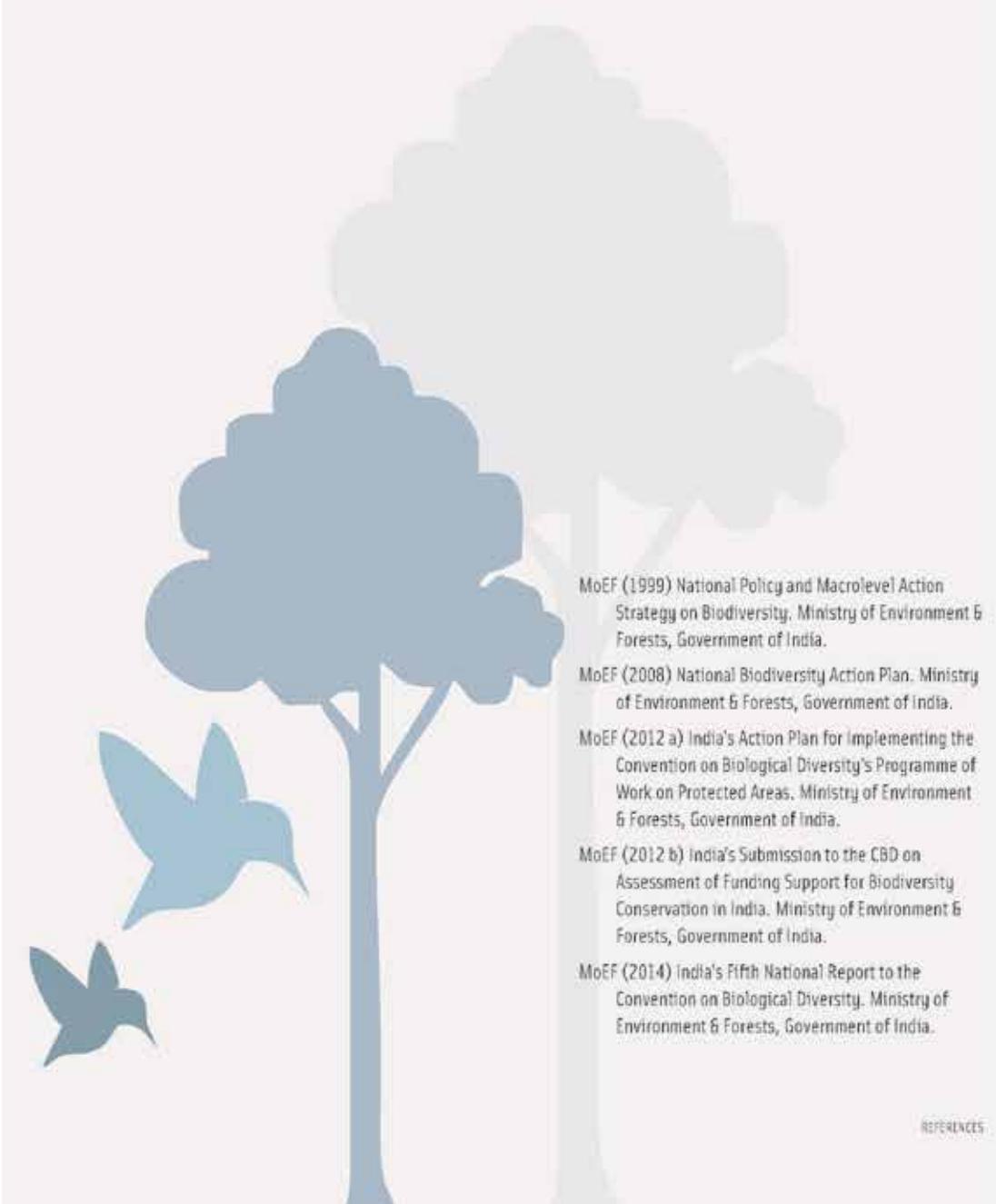
The activities listed in the NBAP are ongoing, and are being undertaken under the ambit of existing schemes and programmes by the Central and State Governments, public and private sector as well as civil society organisations, securing full utilisation of available infrastructure and funds, with augmentation and further inputs, wherever required. In addition, sources of bilateral and multilateral funding are explored and availed of for implementing some of these activities, in accordance with the extant policies and regulations. Thus, the action points in the NBAP are to be the basis for seeking funds from domestic and external sources. In order to sharpen the inter-linkages between the Aichi Biodiversity Targets and India's NBAP, the plan schemes and programmes of the MoEF and those of other Ministries/Departments of the GoI have to be further aligned for their outcomes in terms of indicators provided by the Aichi Biodiversity Targets/NBTs in the coming years. Further, possibilities of leveraging substantial financial resources at the national level to implement India's NBAP in the light of SP 2011-2020 and the Aichi Biodiversity Targets also needs to be explored. Towards this, an indicative list of Ministries/Departments has been prepared with respect to each NBTs (Table 4).

Moreover, fulfilling the overall aim of the NBAP and progress towards achieving NBTs requires widespread public engagement and participation wherein opportunities are made available at the individual level that enable citizens to make long-term choices that support biodiversity and its conservation. This is because conservation of biodiversity has to be everyone's responsibility. While Governments have to play a crucial facilitative role, all citizens must work together and contribute to meet the challenge of halting the continuing decline in biodiversity.



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ADDENDUM 2014
TO NBAP 2008



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APPENDIX I.

STRATEGIC PLAN FOR BIODIVERSITY 2011-2020 AND THE AICHI TARGETS "LIVING IN HARMONY WITH NATURE"

NATIONAL BIODIVERSITY
ACTION PLAN (NABP)

The Vision

"By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."

The Mission

"Take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented and decision-making is based on sound science and the precautionary approach."

Strategic Goal A:

Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society



Target 1

By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.



Target 2

By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.



Target 3

By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.



Target 4

By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

ADDENDUM 2014
TO NBAP 2008

Strategic Goal 8:
Reduce the direct pressures on biodiversity and promote sustainable use

**Target 5**

By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

**Target 6**

By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

**Target 7**

By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

**Target 8**

By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

**Target 9**

By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

**Target 10**

By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic Goal 9:
To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

**Target 11**

By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.



NATIONAL BIODIVERSITY
ACTION PLAN (NABP)



Target 12

By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.



Target 13

By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic Goal D:

Enhance the benefits to all from biodiversity and ecosystem services



Target 14

By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.



Target 15

By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.



Target 16

By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Strategic Goal E:

Enhance implementation through participatory planning, knowledge management and capacity building



Target 17

By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.



Target 18

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their

ADDENDUM 2014
TO NBAP 2008

customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels,



Target 19

By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.



Target 20

By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011–2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

APPENDIX II GLOBAL STRATEGY FOR PLANT CONSERVATION (GSPC): OBJECTIVES AND TARGETS

NATIONAL BIODIVERSITY
ACTION PLAN (NBAP)

Objective I: Plant diversity is well understood, documented and recognized

- Target 1: An online Flora of all known plants
- Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action
- Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared

Objective II: Plant diversity is urgently and effectively conserved

- Target 4: At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration
- Target 5: At least 75 per cent of the most important areas for plant diversity of each ecological region protected, with effective management in place for conserving plants and their genetic diversity
- Target 6: At least 75 per cent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity
- Target 7: At least 75 per cent of known threatened plant species conserved in situ
- Target 8: At least 75 per cent of threatened plant species in ex situ collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes
- Target 9: 70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated Indigenous and local Knowledge
- Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded

Objective III: Plant diversity is used in a sustainable and equitable manner

- Target 11: No species of wild flora endangered by international trade
- Target 12: All wild-harvested plant-based products sourced sustainably
- Target 13: Indigenous and local knowledge, innovations and practices associated with plant resources, maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care



ADDENDUM 2014
TO NBAP 2008

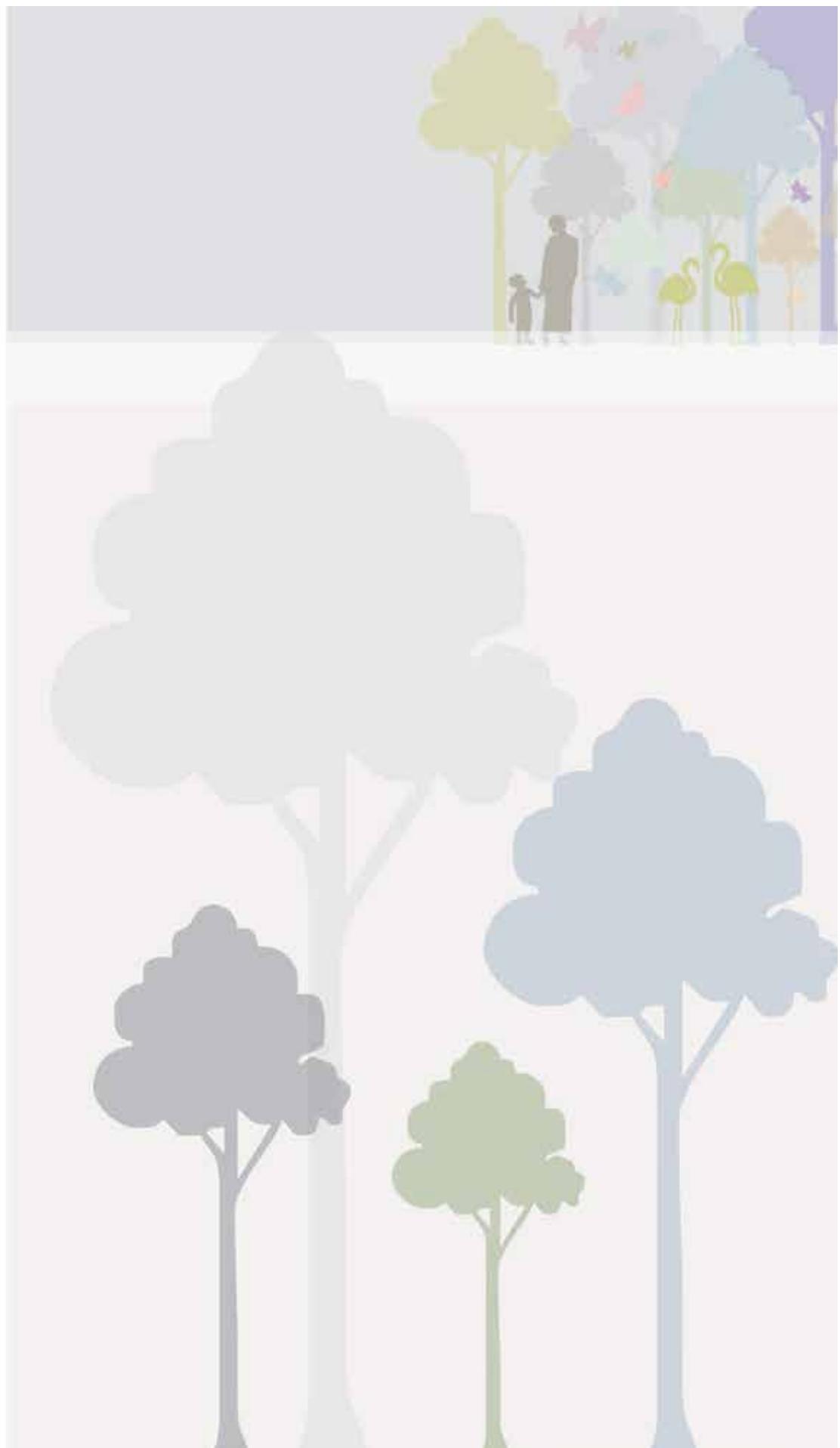
Objective IV: Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on earth is promoted

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes

Objective V: The capacities and public engagement necessary to implement the Strategy have been developed

Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy

Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy





Ministry of Environment,
Forests & Climate Change
Government of India

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8.3. Proceedings of the Stakeholder Consultations





HCLFoundation



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Minutes of Meetings held with Societies





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Minutes of the Meeting held at Windsor Greens, Sector 50, Noida

Date: 28 June 2023 | **Venue:** RWA Office

The meeting was attended by:

1. Mr G.V.Singh
2. Mrs. Parul Sachdeva
3. Mrs. Manju Gupta
4. Mr Suniti Kumar Jha

The meeting started with Dr Monalisa Sen providing the attendees with a background about ICLEI-Local Governments for Sustainability, South Asia and the work of the organisation. The project was then introduced to the attendees. The concept of the Local Biodiversity Strategy and Action Plan and the need for the same in Noida was explained to the attendees. Following this, a discussion on the significant ecosystems in Noida, the ecosystem services provided by them, the beneficiaries of the same and the threats was held. The attendees were of the opinion that river, parks, open spaces, golf course, forest patches are the most critical ecosystems in Noida. The river, while benefitting all residents, particularly the farmers, is under threat due to direct discharge of sewage and waste.

According to the attendees the parks (with special reference to Meghdootam Park, which is very close to this society), provide regulating and cultural ecosystem services. The parks provide benefits to all the residents and also to children from the nearby villages. Though the parks are maintained well by the Noida Authority, activities like lazer shows, organised by the Authority pose a threat to this ecosystem. The parks also harbour a rich avi-faunal diversity.

Open spaces act as a buffer for sound and noise pollution and residents are benefitted from the same. Squatters and rapid urbanisation are threats to this ecosystem.

Golf courses provide with the regulating ecosystem service of oxygen to the residents and face no threats.

Forest patches (like the one near Sector 15 A), provide several benefits including oxygen and also attract more rain. Rapid urbanisation, population pressure, land grabbing, land use conversion are threats to this ecosystem.

One of the attendees mentioned that there has been a decline in the avifaunal diversity in the area, since 2005. She mainly attributed this to the increase in the pigeon population, over time. According to her the peafowl population has also declined. This was contradicted by another resident (whose flat faces Meghdootam Park) and she mentioned that due to the Park, the avifaunal diversity and population has increased and is a healthy one.

All the attendees were of the view that unauthorised construction should be halted. They also expressed the need to have more plantations and green belts, which will in turn help to improve the biodiversity of the city. Water is a major concern and the residents wanted the promotion of use of technologies that can treat turbid water (which has very high TDS).

Though situated close to Okhla Bird Sanctuary, the attendees did not mention this as an important ecosystem for the city. They were not even aware of the exact location or route of access to the same.

The meeting ended with the representatives of ICLEI South Asia thanking the attendees for their time and explaining the next steps that will be taken to develop the LBSAP in a participatory manner. The attendees assured their full support and cooperation for the same.



Meeting in progress at Windsor Greens

Annexure 1: Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
River	Water	Residents; Farmers	Direct discharge of sewage from nallahs; garbage dumping
Parks	Fresh air; health benefits; cultural activities	Residents; Some visitors; Children from villages nearby	Activities like Lasor that are promoted by the Noida Authority
Open spaces	Act as buffers between traffic and colonies	Residents	Squatters; Rapid Urbanisation
Golf Courses	Open area; provide oxygen	Residents	No threats
Forest patches	Fresh air; attract more rain	Residents	Urbanisation; population pressure; land use change

Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: WINDSOR GREENS ; SECTOR 50

Date: 28 JUNE 2023

Time: 10:30AM

Sl. No.	Name of Participant	Mobile Number	Signature
	U. V. Singh	9810224592	
	Paul Sachdeva	8527710881	
	Manju Gupta	9811178882	
	Suniti Kumar Mehta	7103941907	

Minutes of the meeting held with Federation of Noida Welfare Association (FONWRA), Sector 52, Noida

Date: 28 June 2023 | **Venue:** FONWRA Office

The meeting was attended by:

1. Mr K.K. Jain, General Secretary

The meeting started with Dr Monalisa Sen providing the attendees with a background about ICLEI-Local Governments for Sustainability, South Asia and the work of the organisation. The project was then introduced to the attendees. The concept of the Local Biodiversity Strategy and Action Plan and the need for the same in Noida was explained to Mr K K Jain. Following this, a discussion on the significant ecosystems in Noida, the ecosystem services provided by them, the beneficiaries of the same and the threats was held. Mr K K Jain was of the opinion that river, irrigation drains, green belts, parks, Okhla Bird Sanctuary are the most critical ecosystems in Noida.

The river, earlier had 11 rainy wells and which used to supply water. However only 3 of these are no functional and the river has thus lost its water supply function. It is now under threat due to garbage dumping and discharge of industrial effluents.

The irrigation drains, which carry sewage, are now under threat due to waste dumping and clogging. These overflow in the rainy season, leading to their being a health hazard as well.

Green belts are present in each sector and provide regulating and cultural services to the residents. Unauthorised settlements (which are removed intermittently by the Noida Authority) are a threat to this ecosystem.

The parks provide regulating, health and cultural services to the residents. Though these are well maintained there have been incidences of damage being caused by children who use the parks as cricket and football grounds.

Okhla Bird Sanctuary provides natural beauty and supports a rich diversity of avi-fauna. This ecosystem faces no threats and is well maintained by the Forest Department.

Mr K K Jain has himself not visited Okhla Bird Sanctuary.

With regard to suggestions, Mr K K Jain mentioned that to improve green belts and parks, the Noida Authority needs to identify more spaces for development of green belts and parks. Plantation should be undertaken in each season. Change in human behaviour needs to be promoted in a manner that birds are not threatened due to poaching. The green belts need to be maintained and kept garbage free.

He mentioned that there have been times when the water level in Okhla Bird Sanctuary has gone very low. Efforts need to be taken to maintain the water level as well as quality. Regular monitoring of the water quality needs to be undertaken.

No major steps have been taken by the Government to clean the river. This is needed on war footing. The dis-functional rainy wells also need to be repaired. River front beautification needs to be undertaken. This will help to increase a sense of belonging among the residents for the river as they will be able to undertake recreational activities. Conservation awareness activities also need to be promoted along the river front.

The meeting ended with the representatives of ICLEI South Asia thanking Mr K K Jain for his time and explaining the next steps that will be taken to develop the LBSAP in a participatory manner.



Discussion with Mr KK Jain

Annexure 1: Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
River	Water	Residents	Disfunctional rainy wells, garbage dumping, discharge of industrial effluents
Irrigation drain	Water	Residents	Waste disposal, sewage disposal; health threat in rainy season due to over flooding
Green belts	Oxygen, aesthetics	Residents	Unauthorised settlements
Parks	Open area; provide oxygen; Aesthetics; Health Benefits	Residents	Sometimes used by children as playgrounds
Okhla Bird Sanctuary	Natural beauty, supports biodiversity	Residents; Visitors	No threat; well maintained by the Forest Department

Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: Federation of Noida Res. Welfare Association (FONRA)
 Date: 20/06/2023
 Time: 11.45 AM

Sl. No.	Name of Participant	Mobile Number	Signature
1.	K K JAIN	9998022019	

Minutes of the meeting held at B- 12A, Dhawalgiri, Sector 34, Noida

Date: 9 July 2023 | **Venue:** RWA Office

The meeting was attended by:

1. S P Chamoli, Secretary
2. Dinesh Kumar Bhati
3. O.S. Pokhriyal
4. Sabal Kumar Ray
5. Komal Mishra
6. Sangeeta
7. Anil Kumar
8. V.S. Negi
9. Daleep Dhyani
10. Sangeeta Gupta
11. Usha Bhaskar
12. Sashi Adhikari
13. Saroj Thapliyal
14. Sulekha

The meeting commenced with Dr. Monalisa Sen delivering an overview of ICLEI-Local Governments for Sustainability, South Asia, and providing insights into the organization's work. Subsequently, the attendees were introduced to the project at hand. The session involved a comprehensive explanation of the Local Biodiversity Strategy and Action Plan, emphasizing its relevance to Noida. Furthermore, a discussion ensued regarding the pivotal ecosystems in Noida, their associated ecosystem services, beneficiaries, and the imminent threats they face. The attendees were of the opinion that tree patches, Kondli nala, Forest near Sector 53, Parks, Stormwater drains, Wetlands, Plantation belt in Sector 32 and Okhla Bird Sanctuary as the most critical ecosystems in Noida.

The tree patches provide environmental benefits, provide oxygen, aid in pollution control, help to keep odour from wastewater drains at bay and improve aesthetics. The issue raised by the residents is with regard to the maintenance. Noida Authority does not prune the trees properly and only cuts the lower branches. The trees thus become top heavy and are not balanced, and are at the risk of toppling over.

Kondli Nala, though originally an irrigation canal, now helps to take the sewage discharge from residences. The original benefits from the Nala have thus been lost. The gases being emitted from the nala are having an adverse impact on the electrical appliances.

The forest in Sector 53 acted as a green lung for the city. It also had sewage treatment plant. Garbage dumping is the biggest threat, due to which it has been converted into more of a dumping area. This practice was halted only after NGT stepped in.

Parks provide walking, aesthetics, oxygen, and also provide picnic spots (eg Nandan Kanan Park). Land use change, dumping of construction waste are major threats to parks.

Storm water drains help to prevent flooding in the city. However the fact that sewage is pumped into them (and they act now more as sewage drains) has disturbed the ecology of the drains completely.

Wetland provide habitat to different species of resident and migratory birds, apart from other taxa. They also help in ground water recharge and helps to act as a water sink and reduce flooding incidences. Infrastructure development poses a high threat to the wetlands.

The plantation belt in Sector 32 provided health and aesthetic benefits. The same has however now been lost due to land use change.

Okhla Bird Sanctuary harbours rich biodiversity and acts as a green lung. It also helps in ground water recharge and provides environmental education to students. High rise buildings like Super Nova, present in close proximity to the Sanctuary are a threat to the migratory routes of the birds. The water has also got eutrophied and is full of weeds, thereby restricting the movement of the water birds.

The attendees echoed the fact over and over again that rampant land use change in the city has led to the deterioration of the ecosystems and thereby the ecosystem services provided by them. For example, the green belts in Sectors 76 and 77 have been now allocated for development of a mall. The area from Noida Stadium till the metro used to be a green belt and had fruit bearing trees. The green cover was so high that it housed the office of a Divisional Forest Officer. This area has now been lost, as the same has again been diverted to infrastructure development in the form of a mall. Another change that was mentioned by them was the fact that due to the reduction in availability of fodder, the local villagers have given up the traditional livelihood of buffalo rearing. Instead, seeing the monetary benefit from providing rooms on rent, they have converted all their open lands into buildings (which are now on rent to people who have come to Noida to make a living in the city). Such a trend has seen all the open spaces and green areas in the villages nearby being converted into a buildings.

Another prominent example of degradation of avenue trees that was highlighted by the attendees was that of the DND. Once the road became free and no tax had to be paid, no maintenance of trees, and other infrastructure was carried out. This was a clear case of loss of green infrastructure due to negligence.

The Noida Authority takes up yearly plantations of over 5 crore trees. These are however not provided with any maintenance and majority of them do not survive.

Dumping of industrial effluents and land use change has resulted in the Hindon river being reduced to a drain.

The attendees highlighted the need for public ownership in the maintenance of green and blue infrastructure. According to them the condition of the parks in Sector 34 is very good as the residents are aware of their benefits and take ownership in the maintenance of the same.

They also emphasised on the need to plant fruit bearing trees. The absence of fruit bearing trees (in the plantations that is carried out by the Authority) and loss of green cover due to land use change has resulted in monkeys coming into the societies, in search of food.

In addition, green belts need to be developed, instead of lawns with only grass cover. There are several patches of barren land, along the Yamuna. Tree plantation, with focus on native trees needs to be carried out on all these areas.

Pond restoration in nearby villages such as Morna, Hoshiarpur, Chaura, and Vidarb needs to be taken up on war footing. The traditional knowledge of the elderly living in the villages needs to be used for the same. This wealth of knowledge also needs to be used in defining the crops to be grown. The focus on cultivation of only cash crops needs to be changed.

Rain water harvesting needs to be made mandatory for all existing and upcoming residential complexes and houses in the city. Strict enforcement of the same needs to be carried out by the Noida Authority.

Protecting existing forested patches, such as the Okhla Bird Sanctuary, was recommended by implementing a policy to prevent high-rise buildings from being constructed within a five-kilometre radius of these areas. Regular maintenance of the area's water sources was also stressed.



Meeting in progress with residents of Dhawalgiri, Sector 34

Annexure 1: Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
Tree patches	Fodder for cattle, pollution control, oxygen, keeps odour away, aesthetics	Residents and common people	Improper maintenance by Noida Authority
Kondli nala	Earlier provided irrigation water; now carried sewage from households	Residents	Garbage dumping, and clogging of the nala
Forest cover near Sector 53	Green belt, had sewage treatment plant	Residents	Garbage dumping
Storm Water Drains	Stromwater discharge	Residents	Sewage disposal and waste dumping
Wetlands	Oxygen, aesthetics, biodiversity	Residents	Infrastructure development in the vicinity
Parks	Open area; provide oxygen Health Benefits	Residents	Dumping of construction waste; land use change
Okhla Bird Sanctuary	Natural beauty, supports biodiversity	Residents	Supernova (High rise building, eutrophication, weed infestation)

Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: B-12 A Dhawalgiya, Sector-32

Date: 9 JULY 2023

Time: 10:30 AM

Sl. No.	Name of Participant	Mobile Number	Signature
1.	Dinesh Kumar Bhati	9899106185	
2.	O. S. Patkhival	9871338610	
3.	Sabal Kumar Ray	9818770444	
4	Shivam Mehta	989970381	
5	Sangeeta		S. Sangeeta
6	Amil Samir	9811967005	
7.	V.S. Negi	965099931	
8	Sangeeta Gupta	9910999886	
9	Usha Bhaskar	9818063508	
10.	Shashi Achliyan	9968099691	
11.	Saraj Thapliyal	9711882031	
12	Daleep Shyani	9811070721	
13	Subekhi	9968908688	
14	S.P. Charnah	9810221633	

Minutes of the meeting held with D Block, E block, H Block & J block of Sector 22, Noida

Date: 10 July 2023 | **Venue:** Green belt of H Block, Sector 22

The meeting was attended by:

1. Mr Pradeep Vohra, President
2. Mr Sumit Kumar, General Secretary
3. Mr Shivam Vohra
4. Ms Anjana Bhage, President, Sector 11
5. Mr Bhupen Deb
6. Mr M.S. Rawat
7. Mr K.C. Kainthola
8. Mr L.D. Joshi
9. Mr Vinod Rawat, President, E block
10. Mr Surendar Bhati
11. Mr Durgaprasad
12. Mr L.S. Solanki
13. Ms Manju Barthwal
14. Ms Ambika
15. Ms Kavita
16. Mr Anil Rawat
17. Ms Lata Rawat, President J Block
18. Ms Sarojini Bafila
19. Ms Laxmi Bisht
20. Ms Dhanuli Devi
21. Mr Y.P.S. Sharma

The meeting commenced with Ms Priya Hazra delivering an overview of ICLEI-Local Governments for Sustainability, South Asia, and providing insights into the organization's work. Subsequently, the attendees were introduced to the project at hand. The session involved a comprehensive explanation of the Local Biodiversity Strategy and Action Plan, emphasizing its relevance to Noida. Furthermore, a discussion ensued regarding the pivotal ecosystems in Noida, their associated ecosystem services, beneficiaries, and the imminent threats they face. The attendees stated that the Hindon river, green belts, wetlands and forest patches, specially Okhla Bird Sanctuary as the most critical ecosystems in Noida.

The river was once known for its natural flow but now it has dwindled into a meagre stream, which is dumped with garbage. Land use change has also led to the reduction in the area of the river bed. ..

The sewage flowing in Kondli Irrigation canal creates numerous issues while it passes through D, H, and J blocks. Residents stated that the gases emitting from the canal have an adverse impact on their air conditioners and the coolant needs to be constantly refilled.. Additionally, the residents added that the gases emitted from the canal have resulted in residents needing to replace their electronic goods every three to four years.

The residents of Sector 22 are highly conscious of the presence of green belts within their sector. They have taken the initiative to create three parks, which have been entirely funded by them. Sector 22 boasts of a total of 25 green belts, which includes four parks.. The green belt has

Mango (*Mangifera indica*), Guava (*Psidium guajava*), Lemon (*Citrus limon*), Neem (*Azadirachta indica*), Jamun (*Syzgium cumini*), Pakad (*Ficus virens*), and Semal (*Bombax ceiba*) trees, some of which are 10-15 years old. The residents have collectively been successful in halting any land use change in the green belt. The residents value these green belt plants for the fresh air, shade, fruits, recreational opportunities, and provide play space for the children.

Some members of the Resident Welfare Association (RWA) in Sector 22 were also among the petitioners who filed a plea to convert a nearby wasteland in Sector 54 into a wetland, with the aim of environmental conservation.

The residents are well aware about Okhla Bird Sanctuary. According to an elderly individual, the sanctuary is in a healthier condition now, as compared to 2007-2008. However, the construction of the Supernova Tower has raised concerns among the residents. They believe that the construction of such a tall and multistorey building would disrupt the utilization of the bird sanctuary as a breeding ground by migratory birds.

To tackle the challenges regarding degeneration of River Hindon, the residents have suggested that the authorities should administer strict regulations and not permit land use change and waste dumping in the River. caution while granting the permits to individuals involved in such activities. To reduce increased level of pollution of sewage canal and reduce the production of hazardous gas, the residents suggest that the authorities cover the entire canal and incorporate a few outlets for canal cleaning. For better management of Okhla Bird sanctuary, they suggested that authorities can play a significant role in controlling the development of high-rise buildings in order to protect the sanctuary and its avian inhabitants

The meeting ended with the representatives of ICLEI South Asia thanking the attendees for their time and explaining the next steps that will be taken to develop the LBSAP in a participatory manner.



Meeting in progress at Sector 22

Annexure 1: Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
Hindon River	Groundwater recharge, used to be a source of water for irrigation	Residents, Farmers	Land use change, Solid waste Dumping
Green belts	Fresh air, shade, fruits, recreational activities, children can play.	Residents	Land use conversion
Okhla Bird Sanctuary	Recreational purposes, air purification	Residents, Visitors	Supernova and other high-rise buildings in nearby area
Kondli Irrigation Canal	Used to supply irrigation water	Residents, Farmers	Sewage disposal

Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: Sector 22 (D, E, Hand J block), Noida

Date: 10th July, 2023

Time: 12.45 pm

Sl. No.	Name of Participant	Mobile Number	Signature
1.	MANJU BARTHWAJ	9999049777	
2.	Ambika Dharshana	9871436084	
3.	Kavita	8178169830	
4.	Anita Rawat	9958261540	
5.	Lata Rawat	9589856004	
6.	Singini Bafila	9650236017	
7.	Laxmi Bahl	8700795586	
8.	anjali		anjali
9.	Y.P.S. Sharma	9811320855	

Contd...--



P-2



Sl. No.	Name of Participant	Mobile Number	Signature
10	L. S. Salcwanji	9990857538	
11	H. 275 Gopalkrishna	9899025186	
12	H. 249 Surendra Bhatt	9650370136	
13	E32 G. 22 Vinod Kumar	9911776694	
14	L. D. Joshi (H-158)	9868893063	
15	K. C. Kainthola	9999675075	
16	M. S. Rawat	9643344368	
17	BHUBEN DEE	9911485484	
18	Suraj Kumar	9899153594	
19	Arijane Bhasi	8800508413	
20	Pandey Vohra	9811944006	
21	Shivam Vohra	8920628784	

Minutes of the meeting held at Community Centre of Sector 52, Noida

Date: 16 July 2023 | **Venue:** Community Centre, Sector 52

The meeting was attended by:

1. Ashok Kumar Sharma, President
2. Raghunath Singh, General Secretary
3. Munesh Tyagi
4. Vinod Kumar Ahluwalia
5. Om Prakash Chauhan
6. Chittaranjan Kumar
7. Raj Kumar Rai
8. Raju Pradhan
9. Sandeep Arora
10. Pragati Thapliyal
11. Renu Bansal
12. Usha Singh
13. Saroj Tuli
14. Manohar Lad

The meeting started with Dr Monalisa Sen providing the attendees with a background about ICLEI-Local Governments for Sustainability, South Asia and the work of the organisation. The project was then introduced to the attendees.. The concept of the Local Biodiversity Strategy and Action Plan and the need for the same in Noida was explained to the attendees... Following this, a discussion on the significant ecosystems in Noida, the ecosystem services provided by them, the beneficiaries of the same and the threats was held. The attendees were of the opinion that river, parks, green patches and Kondli irrigation canal are the most critical ecosystems in Noida.

The river was once a source of drinking and irrigation water. Overextraction of the same through increased bore wells and dumping of waste in the river has resulted in these ecosystem services having been lost. The attendees also voiced the concern that the presently the water is unfit for drinking and has very high TDS (in the range of 1500). The attendees also raised the issue of inadequate facilities and lack of focus on rain water harvesting.

The green patches provide benefits like acting as green lungs, and provided aesthetics and helped in addressing air pollution. These are under severe threat due to land use change and infrastructure development.

Parks in the city are better maintained and provide recreational and health benefits. Some of the parks face threats with regard to cleanliness due to littering (plastics and non biodegradable waste) by the visitors.

Kondli irrigation canal at one point of time used to supply water for irrigation. The canal has now been reduced to the status of a sewage drain due to the discharge of sewage from households. Solid waste dumping also leads to clogging of the canal, with the water overflowing in the monsoons. This poses severe health risks. The sewage in the canal leads to foul smell and emission of green house gases.

The attendees highlighted the need for strict enforcement of measures for rain water harvesting. This should be made mandatory for each existing society/ bungalow and should be made mandatory for any new ones. The plan approval for the new residential complexes should have establishment of rain water harvesting facilities as a mandatory criterion.

The participants were also concerned about the trees and their health. Concretisation of the bases of the trees has adverse impact on the growth of the trees. It was suggested that the tree bases should be made free from concrete. In addition, the pavements should use hydraulic pavers instead of the impermeable tiles. This will help in ground water recharge and will also promote the growth of healthy trees. In any multi-storeyed building, it should be mandatory to maintain a fixed proportion of green spaces with trees. The use of grass instead of concretizing all pavements was also highlighted by the attendees. Some of the attendees also raised concern on the type of trees that are planted by the Noida Authority and stated that healthy saplings should be used. A focus should be given on planting fruit bearing trees.

Another area of concern raised by the attendees was solid waste management. The same needs to be done in an effective manner. Household level waste segregation needs to be made mandatory. Reduction in solid waste dumping will help to improve the health of the natural ecosystems (river, parks etc) and thereby contribute to betterment of ecosystem services.

The meeting ended with the representatives of ICLEI South Asia thanking the attendees for their time and explaining the next steps that will be taken to develop the LBSAP in a participatory manner.



Some of the attendees of the meeting held at Sector 52

Annexure 1: Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
River	Drinking water, Water for irrigation	Residents, Farmers	Overextraction of water, solid waste and sewage dumping
Green patches	Green lungs, aesthetics, addressing pollution	Residents	Land use change and infrastructure development
Parks	Recreational services, health benefits	Residents	Littering by visitors
Kondli irrigation canal	Irrigation	Farmers	Disposal of sewage, solid waste dumping

Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: R. W. A. S. 52 Noida
 Date: 16/07/2023
 Time: 11:00 AM

Sl. No.	Name of Participant	Mobile Number	Signature
1.	Ashok Kumar Sharma	9213562892	
2.	Raghvendra Singh	9810976630	
3.	Munesh Tyagi	9810812698	
4.	VINOD KUMAR AHLUWALIA (VINOD BUS SERVICE LLP) <small>OUR HCL FOUNDATION TRANSPORTER</small>	9891794007	 Date: 16/7/23
5.	Om Prakash Chauhan	9820184306	
6.	Chittaranjan Kumar	9810722118	
7.	RAJ KUMAR RAI	9891223348	
8.	Rajiv Pradhan	9312631171	
9.	SANDEEP ARORA	9811081668	



Minutes of the meeting held at Community Centre of Sector 52, Noida

Date: 16th July 2023 | 1Park view Apartment, Sector 51

The meeting was attended by:

1. Rajesh Kumar, Secretary
2. Azhar Usmani

The meeting started with Dr Monalisa Sen providing the attendees with a background about ICLEI-Local Governments for Sustainability, South Asia and the work of the organisation. The project was then introduced to the attendees.. The concept of the Local Biodiversity Strategy and Action Plan and the need for the same in Noida was explained to the attendees... Following this, a discussion on the significant ecosystems in Noida, the ecosystem services provided by them, the beneficiaries of the same and the threats was held. According to the attendees, the most critical ecosystems in Noida are the Okhla Bird Sanctuary, Kondli irrigation canal, Parks, Forest Cover (near sector 54), River Hindon, Avenue trees and Golf courses.

Okhla Bird Sanctuary provides habitat for many resident and migratory birds. It also harbours a good biodiversity and serves as green lungs for the city. The Sanctuary also provides opportunity for environmental education. However, the Sanctuary faces very high levels of siltation and this has led to the decline in fish and thus birds there. The number of migratory birds has also declined due to this and majorly only cormorants can be sighted.

Kondli irrigation canal, once served the purpose of providing water for irrigation. Over time, large belts of agricultural lands have been lost to land use conversion. This resulted in decline in the significance of water for irrigation and thereby Kondli irrigation canal. Direct discharge of sewage from households into the canal has now converted it into a sewage drain. The canal gets clogged due to solid waste dumping and overflows in monsoons, thereby posing a health risk.

The parks in the city are well maintained and provide recreational and health benefits to the residents. They also provide space for children to play and interact with each other. However, the choice of trees that are planted needs to be looked into. *Alstonia scholaris* (Devil's tree), which has been planted in several parks by the Noida Authority, poses a health risk due to respiratory issues during its seed dispersal process. Littering is a threat to the parks. The presence of Indian flying fox (*Pteropus giganteus*), in some of the large trees in several parks is also not seen in a positive manner by a large proportion of the residents, since the outbreak of the Covid 19 pandemic.

The Forest Cover, at Sector 54 provided several benefits like acting as green lungs, providing oxygen, temperature reduction in the micro-climate, food for wild animals and birds. However, a lot of the trees there have been cut down in order to construct a gas depot. This has led to the benefits being reduced drastically.

River Hindon was a source of water (drinking and irrigation) for the city and used to also provide other benefits like fish (for humans and wildlife), support rich biodiversity, act as a water sink during incidences of high rainfall. Pollution, rampant construction on the river flood plains, siltation, solid waste dumping has together led to the decline in the health of this ecosystem, thereby impacting the ecosystem services provided by the same. The reduction in the depth of the river bed (thus reducing the water holding capacity of the river), due to siltation leads to flooding, whenever there is high rainfall. Another factor that has contributed to the increase in pollution in the river is the fact that the sewage from Kondli irrigation canal flows into the river.

Avenue trees help in providing oxygen and reduction in vehicular pollution. They also help in temperature regulation. These trees also provide food for wild animals and birds. Contradictory views on the types of trees that should be planted along the roadside were provided by the two attendees. While both highlighted the fact that trees help bind soil, only one of the attendees agreed that the city needs trees with deep root system (like *Ficus religiosa*). The other attendee was of the view that the city is not located on hill slopes and does not face high levels of soil erosion. Thus the focus should not be on deep root system trees (including fruit bearing trees like *Mangifera indica* and *Syzygium cumini*).

Instead more flowering trees should be planted. Absence of scientific guidelines on what species should be planted in the city is a major threat to this ecosystem.

Golf courses are well maintained and provide health and recreational benefits. No immediate threat was envisaged to this ecosystem. More such golf courses should be established.

Mr. Rajesh has observed a significant decline in the house sparrow (*Passer domesticus*) population over the years, noting that they are unable to utilize high-rise buildings for nest-building. On the other hand, Mr. Usmani has noticed an increase in bird diversity over time, regularly sighting species such as the house sparrow (*Passer domesticus*) and purple sunbird (*Cinnyris asiaticus*) in his surroundings. However, Mr. Usmani has also observed a rise in the pigeon population, which could lead to various health issues.

There is a need to deconcretize the open spaces. This will help in water percolation, thereby leading to increase in the ground water table. Rain water harvesting needs to be mandated in all residential complexes and bungalows. The storm water drains are encroached at several places. These need to be removed on priority basis and the flow in these drains needs to be reinstated. There was also a suggestion for covering the Kondli irrigation canal. The space thus secured should be used to develop a green belt on top of the canal.

Rapid increase in the population in Noida is the primary reason for the deterioration of the blue-green infrastructure in the city. The city has undergone rampant land use change with the steady rise in population pressure. There is an urgent need to carry out a study on the carrying capacity of the city and plan further growth on the basis of the same. Capacity building and awareness generation about urban biodiversity and the need to conserve the same needs to be carried out. Schools and Resident Welfare Associations need to be the focus of such initiatives.

Traffic bottlenecks also need to be addressed on priority. This will help to reduce vehicular pollution and thereby reduce the impact on the biodiversity of the city.

The meeting ended with the representatives of ICLEI South Asia thanking the attendees for their time and explaining the next steps that will be taken to develop the LBSAP in a participatory manner.



Meeting in progress at Park View Apartment, Sector 51

Annexure 1: Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
River Hindon	Drinking and irrigation water	Residents, Farmers	Land use conversion, solid waste dumping, construction on river flood plains, sewage discharge from Kondli irrigation canal
Forest Cover at Sector 54	Green lungs, providing oxygen, temperature reduction in the micro-climate, food for wild animals and birds	Residents	IGL gas depot construction
areas Avenue trees	Oxygen, shade, food for wild animals and birds, addressing air pollution	Residents	Absence of scientific guidelines for tree species selection
Parks	Oxygen, aesthetics, bird diversity, health benefits	Residents	Littering, some trees can cause respiratory issues, presence of Indian flying fox is not seen in good light by some residents (since Covid 19 pandemic).
Golf courses	Recreational and health benefits	Residents	No threat perceived
Kondli Irrigation Canal	Irrigation water	Residents, Farmers	Disposal of sewage, garbage dumping
Okhla Bird Sanctuary	Oxygen, a refuge for migratory birds, biodiversity	Residents, visitors,	High levels of siltation, no maintenance by the Forest Department

Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: Park view Apartment, Sector 51

Date: 16th July, 2023

Time: 12.35 pm

Sl. No.	Name of Participant	Mobile Number	Signature
1.	Rakesh Kumar	9711487780	
2.	Azhar Usmani	9810456480	

Minutes of the meeting held with Members of Various Societies in Noida

Date: 16 July 2023 | **Venue:** Windsor Greens Apartment, Sector 50

The meeting was attended by:

1. Sanjay Kumar, Alok Vihar I, Sector 50
2. Sarahna Prasad, Alok Vihar I, Sector 50
3. Snehal Prasad, Alok Vihar I, Sector 50
4. Arushi Prasad, Alok Vihar I, Sector 50
5. Vinod Agarwal, Sector 121
6. Poonam Muliya, Sector 93 A
7. Manju Gupta, Windsor Greens, Sector 50
8. Vaishali Joshi Mehta, Silver City, Sector 93
9. Pramod Thote, Sector 79
10. Sikha Sinha, Sector 14
11. Adaa Baani
12. Kapil Pandey
13. Manpreet Kaur
14. Prof. P.N.Koul

The meeting started with Dr Monalisa Sen providing the attendees with a background about ICLEI-Local Governments for Sustainability, South Asia and the work of the organisation. The project was then introduced to the attendees.. The concept of the Local Biodiversity Strategy and Action Plan and the need for the same in Noida was explained to the attendees... Following this, a discussion on the significant ecosystems in Noida, the ecosystem services provided by them, the beneficiaries of the same and the threats was held.

The attendees were of the opinion that nallas, wetlands, parks, urban forests, Okhla Bird Sanctuary, tree patches and golf courses and cricket fields are the most critical ecosystems in Noida.

The nallas (irrigation canal and storm water drains) provided water to the residents. Their major function was in flood abatement. Land use change has led to the deterioration of these nallas and they have been reduced to sewage drains. Garbage dumping and disposal from diaries are other threats that this ecosystem faces. The polluted water from these nallas then flows into River Yamuna, thereby adding to the pollution load of the River.

The city earlier had more than 200 wetlands in the form of ponds. Apart from supporting aquatic biodiversity, these wetlands were an effective mechanism for flood mitigation. Land use change and rapid urbanisation has resulted in the loss of all these wetlands.

Parks, including Biodiversity Park at Sector 91, provide recreational and health benefits. However these are not biodiverse and have a lot of invasive plants. For example the Biodiversity Park has a Lantana nursery. In addition, no environmental education facilities exist in any of the parks. Some of the parks are also used for football training, which has adverse impacts on the plant species.

All the attendees recognised the significance of urban forests and highlighted the urban forests at Sorkha and sectors 93 and 150. These act as green lungs, support biodiversity, promote ground water recharge and provide recreational benefits. Encroachments (religious), land mafia and light pollution are the threats faced by this ecosystem.

Okhla Bird Sanctuary supports biodiversity, provides recreational services and offers space for environmental education. However the ecosystem

faces threats from siltation, due to which the water depth has become very shallow. Increase in water hyacinth has also had an impact on the bird population in the Sanctuary. The highway which runs across the Sanctuary, sound pollution from the traffic and the presence of high tension power lines, above the Sanctuary are also threats to the same. A study to estimate the existing food base and measures to augment the same is needed on priority basis.

Tree patches provide oxygen, habitat for birds and other faunal species and help in temperature control. However this ecosystem faces threats from concretization of the tree bases. This makes the roots weak and are uprooted in storms. In addition, some trees like Eucalyptus and Alstonia scholaris cause environmental and health issues. There is no regulation to prevent planting of invasive tree species. The residents voiced the concern that guidelines on what to plant in residential complexes and institutional areas are missing. One of the societies were advised by the landscape architect on not to plant fruit bearing trees in the residential complex, as the same would invite monkeys.

Golf courses and cricket grounds are another critical ecosystem. The trees present in these areas (eg Noida Golf Course) has native and fruit bearing trees, harbours reptiles, insects and birds. The negative impact of the areas is that they consume a lot of water for their maintenance.

Agriculture was also discussed as an ecosystem. The attendees stated that it is restricted to very small pockets and provide a soothing relief to the eyes. The attendees stated that all these small agriculture pockets should be converted to Miyawaki forests.

The attendees voiced the need for having more forest lands in the city. The present green belts in the city have not been developed with a vision. The water from the drains is not collected anywhere and used for watering the plants. The water just flows into the nallas and is lost. The green spaces have no interconnectivity and exist only as linear central parks. Green pockets need to be integrated with the planning of the city.

Contour based planning is absent and that leads to incidences of water logging. There have been no buffer zones left on the roads and in the sectors.

Rain water harvesting and the maintenance of the infrastructure for the same needs to be made mandatory in all the residential complexes. The choked up recharge pits of all existing rain water harvesting infrastructure needs to be cleaned up.

Contour based, ecology based planning needs to be undertaken by the Noida Authority.

The Noida Authority is looking into implementing nature-based solutions (eg constructed wetlands at Sector 50). However, there is lack of maintenance of the same.

Awareness generation among the residents on the significance of urban biodiversity is very essential. Education about nature and conservation of the same is needed in schools. Summer workshops and internships for the students on different aspects of biodiversity should be institutionalised by Noida Authority.

The meeting ended with the representatives of ICLEI South Asia thanking the attendees for their time and explaining the next steps that will be taken to develop the LBSAP in a participatory manner.



Meeting in progress at Windsor Greens with various members of different societies and Sectors of Noida

Annexure 1: Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
Nalas	Irrigation water; flood abatement	Residents	Land use change, sewage disposal, garbage dumping, discharge of waste from diaries
Parks	Recreational and health benefits	Residents	Not very biodiverse, invasive species, use of parks for football training
Wetlands	Groundwater recharge, biodiversity, flood mitigation	Residents	Land use change, rapid urbanisation
Urban forests	Green lungs, support biodiversity, promote ground water recharge and provide recreational benefits	Residents	Encroachments, land mafia, light pollution
Tree patches	Oxygen, habitat for birds and other faunal species and help in temperature control	Residents	Concretisation of tree base, lack of focus on native species, absence of guidelines on species to be planted
Golf courses and cricket fields	Native and fruit bearing trees, harbours reptiles, insects and birds	Residents	Maintenance consumes high levels of water
Okhla Bird Sanctuary	Supports biodiversity, provides recreational services and offers space for environmental education	Residents, visitors	Siltation, increase in water hyacinth, presence of highway and high tension power lines, sound pollution



Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: MEMBERS OF VARIOUS SOCIETIES

Date: 16 JULY 2023

Time: 3:00 PM

Sl. No.	Name of Participant	Mobile Number	Signature
1	SANJAY KUMAR I work for Sustainable farming and run a Company called Sreekrishna Alok - Village 1, Sector 50, Noida	9813238222	<i>Sanjay</i>
2	SARAHNA PRASAD	8860647557	<i>Sarshna Prasad</i>
3	SNEHAL PRASAD	8447517747	<i>Snehal Prasad</i>
4	ARUSHI	9334152287	<i>Arushi</i>
5	VINEED AGARWAL Sector 121, Noida	9899437350	<i>Vineed Agarwal</i>
6	Paonam Mehta ATS Village Sec. 93A, Noida	9971590808	<i>Paonam Mehta</i>
7	Manju Gupta F-28/50 201 Windsor Greens	9811178882	<i>Manju Gupta</i>
8	Vaishali Joshi Mehta 515, Tower-6, Silvercity-93	9971799601	<i>Vaishali Joshi Mehta</i>
9	PRAMOD THOTE F-1604, HILTON URBTECH SECTOR 79, NOIDA	9811550301	<i>Pramod Thote</i>



Minutes of the meeting held with Members of various societies of Sector 34, Noida

Date: 13 August 2023 | **Venue:** Community Centre Sector 34

The meeting was attended by:

1. S.P. Chamoli
2. Dinesh Bhati
3. S.K. Singhal
4. Diwakar Sharma
5. Anil Dhyani
6. Amardeep Saxena
7. Tapesh Jha
8. O.S. Pokhriyal
9. Subal Kumar Roy
10. Bachi Ram Mairdul
11. Sanjiv Mishra
12. D. Dev Roy
13. Reeta Upadhyay
14. Arbind Sinha
15. Jagat Singh
16. JS Panwar
17. Narender Sing Rawat
18. Surender Singh Negi
19. Anil Dumir
20. Jagat Singh
21. Vinod Rai
22. Jaydev Singh
23. Rajesh Tiwari
24. Avshish Saxena
25. Mahesh Sood

The meeting commenced with Dr. Monalisa Sen providing the attendees with background about ICLEI-Local Governments for Sustainability, South Asia, and the work of the organization. The project was then introduced to the attendees. The concept of the Local Biodiversity Strategy and Action Plan and the need for the same in Noida was explained to the attendees. Following this, a discussion was held on the significant ecosystems in Noida, the ecosystem services provided by them, the beneficiaries of the same, and the threats.

Attendees collectively acknowledged that River, Parks, Avenue trees, and Canals are the critical ecosystems in the city.

River Hindon, in earlier days was a wide and vibrant river and provided an array of ecosystem services. The volume of water and flow in the river in earlier days can be gauged from the fact that there was regular boat service across the river for people to move from Noida to Ghaziabad. Land use conversion, development activities and infrastructure development on the flood plain, discharge of sewage and effluents into the river has led to the degradation of the same. Over time, with the emergence of better road and rail transport and reduction in reliance of the local

community on river and its resources (due to other livelihood options and land use change), have also contributed to river losing its significance and getting degraded.

Parks were specifically emphasized on for their role in offering recreational spaces for residents and promoting community health and well-being. The participants highlighted an example of a neglected junkyard that has been transformed into a vibrant park in Sector 34. The residents however raised concern over the type of species being planted (a focus on flowering trees and not native ones by Noida Authority) and also on the fact that due to the excessive number of trees being planted, there are no open spaces being left in the parks where children can play. The present manner of excessive plantation in the parks is only leaving narrow walking and jogging tracks, but play spaces for children are not being kept in mind.

Avenue trees act as green lungs and provide health benefits to the residents. Though the city, and in particular Sector 34 has a several green belts, the type of species that are being planted in the avenues is a matter of concern. The participants suggested that instead of planting trees like Devil's Tree (*Alstonia scholaris*), which causes health issues due to the pollen, more emphasis should be given on planting trees which provide more shade and release high volumes of oxygen, like Neem (*Azadirachta indica*) and Peepal (*Ficus religiosa*). Another issue that was pointed out was the fact that adequate spacing is not provided between two trees, which hampers their growth. Also the present focus is on planting very tall trees, which get entangled in the overhead cables. The pruning practices adopted by the electricity department are also unplanned and lead to chopping off of tree branches, instead of pruning. Lack of awareness among people on the need for trees was also highlighted as a threat.

Kondli Canal earlier used to provide irrigation water and also helped in flood abatement. The ecosystem has become highly degraded now due to the direct discharge of sewage into the canal. Solid waste dumping and plastics have further added to the problem and have clogged the water flow. This leads to overflow of the water from the canal, during monsoons, leading to health threats. The methane gas that is emitted from the sewage and solid waste dumped in the canal has adverse impact on the electrical appliances like air conditioners.

The participants stressed on the need for extensive and continuous awareness generation activities that are needed in the city in order to sensitise residents on the significance of trees. Sighting examples of residents having cut full grown trees within their apartment complexes to ensure sunlight coming into their flat, the participants stated that community awareness generation is critical. The same is also critical with regard to stopping the use and dumping of single use plastics and polythene bags. Some of the suggested tools for awareness generation that were suggested by the participants included street plays, lectures, IEC material and physical events in the societies.

The participants also stressed on the need for rain water harvesting and stated that the Noida Authority should make the same mandatory for all existing and upcoming bungalows and housing societies. Strict enforcement of the same should also be ensured by the Authority. Another issue that came up during this discussion was the need to have dual pipelines, in order to prevent the mixing of grey water and storm water. This infrastructural change needs to be looked into, on priority basis by the Noida Authority.

The need for Noida Authority (Horticulture Department) to work in coordination with the Resident Welfare Associations was emphasised, particularly with regard to undertaking plantations and development and maintenance of the parks and green spaces. The participants emphasised on the need for development of guidelines for undertaking plantations, which should include details of species that can be planted, spacing that needs to be maintained between two saplings and maintenance protocols. The participants also highlighted on the need for involving botanists and ecologists for the same. Their advice and guidance should be seeked by the Noida Authority on all aspects of greening.

The meeting ended with the representatives of ICLEI South Asia thanking the attendees for their time and explaining the next steps that will be taken to develop the LBSAP in a participatory manner.



Meeting in progress at community centre sector 34 with various members of different societies in sector 34, Noida

Annexure 1 : Summary of the discussions on ecosystems and the ecosystem services

Ecosystem	Ecosystem Service	Who Benefits	Threats
River Hindon	Groundwater recharge, biodiversity, livelihood for local community, flood control	Residents	Land use change, rapid urbanization, sewage disposal, solid waste dumping, infrastructure development on river floodplain, reduction in reliance of local community on river and its resources for food and livelihood
Parks	Recreational and health benefits, Provide oxygen, clean air	Residents	Less biodiverse, unplanned tree plantation
Avenue trees	Oxygen, Clean air	Residents	Unplanned plantation, cutting of trees due to road construction and overhead cables, lack of awareness on need for trees, incorrect species selection, inadequate spacing between trees
Kondli Canal	Irrigation water; flood abatement	Residents	Sewage discharge, dumping of plastics and solid waste

Annexure 2: List of Participants



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Meetings with Societies

Name of the Society: Societies of Sector 34, Noida
 Date: 18th August, 2023
 Time: 9:30 am

Sl. No.	Name of Participant	Mobile Number	Signature
1	S. P. Chimali ^{Dhawalgarh} B-12A	9810221633	<u>Signature</u>
2	Dimiit Bhati ^{Dhawalgarh} B-12A	9899104185	<u>Bhati</u>
3.	Dr. S. K. Singhvi ^{Himgiri} Himgiri	9868516554	<u>SK</u> —
4.	Diwakar Sharma ^{B-14} Himgiri	8800773003	<u>Diwakar</u>
5	ANIL DHAJAWI ^{B-14 Himgiri}	9650045913	<u>Anil</u>
6	AMARDEEP SAXENA ^{B-14/127, Himgiri}	9199989224	<u>Am</u>
7	TAPESH JHA ^{B/14/729 Himgiri}	9999598893	<u>Tapeesh Jha</u>
8	O. S. POKHARIYAL ^{B-12A, Dhawalgarh}	9891338610	<u>O. S. POKHARIYAL</u>
9.	Subrat Kumar Ray ^{B-12A, Dhawalgarh}	9818770444	<u>Subrat Ray</u>



HCLFoundation



Proceedings of the Stakeholder Consultation Meeting on the Development Local Biodiversity Strategy and Action Plan for Noida, Uttar Pradesh, India

Amity University, Noida | 14 September 2023





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Developing the Local Biodiversity Strategy and Action Plan

A Local Biodiversity Strategy and Action Plans (LBSAP) is a guiding strategy with specific actions suggested for the local governments to achieve “optimal and realistic governance and management of biodiversity and ecosystem services” (Avlonitis et al., n.d.). An LBSAP, in essence, is the local equivalent of National and State Biodiversity Strategy and Action Plan.

The initiative will support the city of Noida to understand and unlock, within its specific local context, the potential of nature to provide essential services and new or enhanced economic opportunities, while simultaneously protecting and enhancing the biodiversity and ecosystems on which these services and opportunities depend. Through the project, Noida will align their planning with the National Biodiversity Strategy and Action Plans (NBSAPs), as required by the Convention on Biological Diversity (CBD) through the development of LBSAPs, which will be one of the few developed in India. This is being funded by the HCL Foundation.

There is an urgent need for the assessment and appreciation of the ecosystem services provided by biodiversity within and around city-regions and to formulate and implement sustainable strategies, which offset investments in conventional infrastructure that has high carbon lock-in and leverage ecosystem services in a sustainable and inclusive manner to make Indian cities safe and resilient. Decisions and actions that affect biodiversity are often taken at the local level, and hence corresponding strategies and action plans need to be developed and implemented at the relevant sub-national level.

The development of the LBSAP follows the process of engaging relevant local stakeholders including municipal and sub-national governmental staff, local communities, community-based organization (CBOs), local businesses and NGOs that are affected by or hold interest in the selected city-region’s ecosystem services. In this context a workshop was held at Amity University on the 14th of September to engage the academic and research stakeholders of Noida city.

What are ecosystem services and why should cities care about them?

Dr. Monalisa Sen in this session provided participants with an overview of ecosystems and the various services provided by the different types of ecosystems. She first introduced ICLEI- Local Governments for Sustainability, South Asia, explaining the purpose of the stakeholder consultation. She then proceeded to explain the various concepts and principles for measuring ecosystem services, touching upon the Payment for Ecosystem Services (PES concept), the Millennium Ecosystem Assessment (2005) Synthesis Report, and the Economics for Ecosystems and Biodiversity (TEEB) methodology. To illustrate why cities should care about ecosystem services, she discussed a few examples from a range of case studies on how ecosystem service assessments and valuations can help demonstrate the value of ecosystems. Finally, she touched upon the City Biodiversity Index and how it can act as a tool for green development planning.

With this, Dr. Sen split the participants into six different groups for the group exercise sessions that followed.

Exercise 1: Scoping biodiversity issues and ecosystem services

The main objectives of the exercise were to identify.

- What are the most critical issues around biodiversity and ecosystems for Noida?
- Which ecosystem services (ES) are important for Noida?
- Where is these ES generated? What is their status and trend? Where do trade-offs between ES occur and how?

The outcome expected for the session was to understand the relevance of ES for urban sustainability and recognize that measures are needed to maintain and enhance ES provision.

The groups were also given the TEEB classification of ecosystem services and were asked to categorize ecosystems in Noida based on the same. All the groups classified ecosystems and their services rendered. The responses are recorded in Table 1.

During the meeting, several major ecosystems were identified, each providing a range of vital ecosystem services while facing specific threats. These included

- Wetlands
- Urban forests
- Botanical Garden and parks
- Agricultural land
- Avenue trees

Wetlands, for instance, offer climate regulation, water security, and flood regulation, and act as a biological supermarket, benefiting migratory birds, humans, small carnivores, bats, and ungulates. However, they are threatened by anthropogenic pressures, including water pollution, soil contamination, bioaccumulation, increased temperatures, and over-exploitation through activities like fishing and tourism.

Urban forests, another critical ecosystem as identified by participants, provide air purification, shade, temperature regulation, and habitat for generalist species, benefiting both wildlife and humans. These green spaces, however, face threats like urban sprawl and development, both vertically and horizontally.

Botanical gardens and parks offer services such as pollination, seed dispersal, cultural services, and urban heat island regulation. These green havens cater to visitors and recreational activities but are vulnerable to threats like waste dumping.

Yamuna River is a lifeline, supporting wetlands, providing food provisions and irrigation, and benefiting humans, riverine birds, ground-nesting birds, aquatic species, and domestic animals. Yet, it faces significant threats from industrial effluents, improper solid waste management, and sewage disposal.

Agricultural field areas are essential for food production and employment generation, benefiting both people and livestock. Nevertheless, these areas are threatened by pesticides, fertilizers, and fragmentation. The meeting's discussions highlighted the importance of understanding these ecosystems' values and the urgency of addressing their vulnerabilities to ensure a sustainable future.

Table 1: Summary of responses for Exercise 1

Group	Ecosystem	Ecosystem Service	Who Benefits	Threats
1	Wetlands	Climate regulation, Water security, Flood regulation, Biological supermarket	Migratory birds, Humans, Small carnivores, Bats, ungulates	Anthropogenic pressures: - Water pollution Soil contamination, Bioaccumulation, Increased temperature, over-exploitation (Fishing, tourism)
	Urban forests	Air Purification, Shade, Temperature Regulation, Habitat for Generalist Species	Generalist species, Humans,	Urban Sprawling, Development & Infrastructure (Vertical & Horizontal)
	Botanical gardens/ parks	Pollination and seed dispersal landscape beautification, Urban heat island regulation,	Shelter for large ungulate (nilgai) and generalist Species (leopards)	Tourism, Recreational Activities, Waste Dumping
	Yamuna River	Supports Wetlands, Food provisions, Irrigation	Humans, Riverine Birds, Ground Nesting Birds, Aquatic Species, Domestic Animals	Industrial Effluents, Improper solid Waste Management, Sewage Disposal
2	Aquatic ecosystem (Yamuna)	Water provision, food Production, research. Aquaculture	Humans, birds, amphibians Fishermen, farmers.	Sewage (pollution, drainage, over-exploitation,

Group	Ecosystem	Ecosystem Service	Who Benefits	Threats
3	Wetlands (Surajpur)	Bird diversity, erosion control & Sediment transport, improved. Water security, seed dispersal	Crop production (farmers), Water irrigation	Habitat degradation
	Urban ecosystems	Carbon stock	Economy, transport,	Urbanisation land degradation,
	Botanical garden	Plant diversity, air quality Improved, seed dispersal.	Herbarium (research), tourism	Pollution, Urbanization
	Okhla bird sanctuary	Bird diversity, seed dispersal	Economy, research work (Migratory birds)	Urbanization
4	River (Yamuna)	Groundwater recharge, Household, Fishing, irrigation, Recreational values	People & wildlife.	Eutrophication / Pollution
	Wetland (Okhla Bird Sanctuary)	Groundwater recharge, Urban Cooling Biodiversity & Conservation Relational activities, to prevent soil erosion.	People & wildlife.	Water Pollution
	Urban biodiversity park (Botanical Garden, Veda Park, Noida sec 137 biodiversity park)	C. Biodiversity & Conservation, Recreational Activities, Urban cooling, Air quality improvement (Purification Climate Regulation, Soil Conservation, Carbon sequestration)	People & wildlife.	Deforestation, Urban heat, Carbon footprints
	Avenue tree (Noida expressway)	To minimize Air pollution, to generate food web, soil conservation	People & wildlife.	Deforestation (logging), Urbanization.
	Agricultural field areas	Food production, generate employment	People & Livestock	Pesticides, fertilizers, fragmentation.
4	Wetland (Surajpur, Sanjay van, Okhla)	Groundwater management	Aquatic animals	Pollution Industrial waste
	River (Yamuna)	Ground water, livelihood services	Farmers, animals	Water pollution
	Urban Park	aesthetic value, clear air, nutrient cycle	Humans	Pollution, plastic waste
	Botanical garden	provision services, medicinal plants, research ethical values, pollination	Humans & Animals	Pollution, water management
	Agricultural ecosystem	Interaction with crop plants & animals from that area	Humans & Animals	Pesticide, pollution, Human - Wild life conflict climate Changes

Group	Ecosystem	Ecosystem Service	Who Benefits	Threats
5	Wetlands	Ground Water recharge Maintenance of water drainage Recreational Values Irrigation	Fishermen Local Village Community for Farmers	Domestic & Industrial Sewage exploitation Over-exploitation of the area Pollution
	Urban forests	Increases the micro-climate of the area. Pollution Control Recreational value	Humans (Urban people)	Development of infrastructure, Deforestation
	Freshwater ecosystem (Yamuna)	Irrigation. Water for Industrial and domestic purposes	Farmers Rural & Urban Community Industries	Water Pollution Industrial Sewage disposal Overexploitation of Resources.
6	Wetlands	Water retention, Carbon sequestration, Water purification Recreation, Biodiversity retention, and conservation, fisheries, Aesthetic value, Nutrient cycling, Soil retention, flood Control, Groundwater recharge, Ecological Succession	Fishermen, Settlers around wetlands, Urban dwellers, forest Department, Noida Authority, Urban wildlife (Native and migratory), and tourism Department.	Encroachment, Urban Development, Pollution, floods, Invasive and alien species, Commercial fisheries,
	Riverine	Addition: - Agriculture, Aquaculture Dilution of pollutants, Drinking water. Animal husbandry, farmhouse and nursery, Riverine transport, for wildlife, Seed dispersal, Climate regulation (local level)	Fishermen, Settlers around rivers, Urban dwellers, forest Department, Noida Authority, Urban wildlife (Native and migratory), and Tourism Department.	Encroachment, Urban Development, Pollution, floods, Invasive and alien species, Commercial fisheries
	Urban parks and woodlands	Carbon sequestration, Water recharge, and discharge Nutrient cycling, Seed dispersal, pollination, windbreaks, Noise barrier, Air purifier, Fruits, fodder, fuelwood, timber, Medicinal plants	Urban dwellers, forest Department, Noida Authority, Urban wildlife (Native and migratory), and Tourism Department.	Encroachment, Urban Development, Pollution, Invasive and alien species

Exercise 2: Understanding activities and actors

Dr. Sen introduced the framework for identifying ecosystem service opportunities before opening the session up for the second exercise. In the second exercise, the activities which influence the provision of relevant ES were explored. Participants were encouraged to identify which actors are involved and to classify the actors and activities as benefitting, stewards and degrading to a particular ES.

The outcome of the session was for a joint understanding of how activities and actors relate to ecosystem service provision. Table 2 presents a summary of the five groups' responses.

Table 2: Summary of responses for Exercise 2

Group	Ecosystem	Stewardship		Benefiting		Degrading	
		Activity	Actor	Activity	Actor	Activity	Actor
1	Wetlands	Management of Invasive Species, Collection of Plastic Waste	Government of India, State Government and Local Bodies	Ecotourism, Water Storage, Food Provisions	General Public	Cattle Grazing	Local Communities
	Urban Forest (Avenue trees) and (Vertical plantation)	Vertical Gardens, Terrace Gardens	MOEFCC, Residents (General Public)	Shade, Shelter for Birds, Mammals, Heat Regulation, Air Purification	Humans, Generalist Species of Birds, Mammals, Reptiles	Infrastructure, Development (Horizontal and vertical)	Development Authority, Municipality and Corporation
	Parks and Botanical Gardens	Maintenance	MOEFCC, Local Bodies, Municipalities	Ecotourism and Shelter, Heat Regulations	School and College Students, Local Peoples, Animals (Generalists)	Plastic Pollution, Waste Dumping, Improper Management, Cattle Grazing	People, Local Communities, Stray Animals
	Yamuna River			Agriculture, Irrigation	Local People, Riverine Birds	Pollution, Effluents, Sewage, Improper Attention	Population of Human Beings, Government of India
2	Aquatic Ecosystem	Yamuna Action Plan	Government of India	Irrigation, Ground Water Recharge, Fishing, Hydropower	Farmer, Fisherman, Government of India, General Public	Pollution, Sewage Discharge, Dam Construction, Overexploitation	Industries, Household Waste
	Wetlands			Erosion Control, Habitat enhancement, Tourism	Local Inhabiting River Banks	Habitat Degradation	Industries, Urbanisation
	Urban Ecosystem			Carbon Stock	Human	Urbanisation	Human, Industries, Vehicle Emissions
	Botanical Garden		Government of India	Plant Diversity, Air Quality Improvement, Seed Dispersal, Herbarium, Tourism	Humans, Government	Urbanisation, Pollution	Humans
	Olkha Bird Sanctuary			Revenue, Research	Researchers, Government	Urbanisation	Humans

Group	Ecosystem	Stewardship		Benefiting		Degrading	
		Activity	Actor	Activity	Actor	Activity	Actor
3	River	Ground Water Monitoring Water Quality Monitoring	Noida Jal Nigam, Ministry of Water Resource	Boating and Fishing	People	Water Pollution, Over Fishing	Industry, Local Community
		Drought Prevention	Forest Department, ICLEI and Other Government NGOs	Tourism, Birding, Migrating Birds	Local People and Tourist	Fragmentation, Plastic Pollution, Invasive Species	Wildlife, Freshwater Life
	Wetland	Plantation	Forest Department	Birds, Breeding Rich Occupation	Urban Biodiversity	Logging	Urban Biodiversity
		Plantation	Forest Department	Birds, Breeding Rich Occupation	Urban Biodiversity	Logging	People
	Biodiversity	Revenue (Economic and Employment)	Farmer and Labourers	Food Generation	Farmers	Pesticides, Drought	Local Community
		Plantation, Maintenance, Afforestation	Forest Department, Municipality of Gautham Budh Nagar, MOEFCC NGO	Restoring Native Luo Diversity	Humans, Generalist, Birds	Deforestation, Exploitation of Ground Water, Pollution	Local Humans
4	Urban Forest	Fishing, Drawing Water for Different Purpose	MOEFCC, Government Departments, NGO, Private and Government Industries	Recreation, Ecotourism	Local Residents, Fishing Community, Industries	Fishing, Degradation, Industrial Waste Encroachment	Private Enterprises, Local Community
5	Wetlands	Management Of shoreline Prohibition Of Industrial Sewage Discharge and Domestic Discharge	Social Forest Department	Improvising Shoreline Fencing		Overexploitation Of Resources Destruction Of Shoreline Pollution	Fishing And Local Community Local People

Group	Ecosystem	Stewardship		Benefiting		Degrading	
		Activity	Actor	Activity	Actor	Activity	Actor
	Urban Forest	Afforestation Regeneration Of Tress	Forest Department	Afforestation		Industrial Sewage Infrastructure Development	Industrialist Government And Local Authorities
	River Ecosystem	Controlling Industrial Sewage and Domestic Sewage Minimal Use of Resources Disposal of Treated Material	Government	Foam Removal		Untreated Industrial Waste	
6	Wetlands	Wetland Management	Noida Authority, Forest Department, Municipality	Creation of Recreational Activities (Ecotourism, wildlife Tourism, etc), Bird Watching	Tourism Department, Local City Dwellers	Fishing and Encroachment, Pollution	Local Encroachers, Urban Settlers
	Riverine	River Cleaning, Flood Plain Management, Plantation, Water Diversion, Protection of Aquatic Life, Check dams	Ministry of Water Resources, Forest Department, Noida Authority	Irrigation, Bird Watching, Farming, Cultural and Religious Activities	Local City Dwellers, Tourist, Small Scale Farmers, Tourism Department, Urban Settlers	Polluting Rivers	Industry, Urban Settlers
	Urban Parks and Woodland	Park Maintenance, Plantation, Recreation Activities	Noida Authority, Horticulture Department, Forest Department, Tourism Department	Lopping, Jogging and Walking	Electricity Department and Slum Dwellers, Urban Settlers	Degradation of Trees Due to Insect and Fungal Attack, Grazing, Exotic Plantation, Solid Water Disposal and Plastic Dumping	Aphids, Fungal Spp. Etc, Forest Department, Irresponsible Citizens

Exercise 3: Brainstorming session

This session focused on collecting ideas on how to improve the situation (which activities, management measures or policy instruments could help). Each group was asked to come up with at least three ideas on how to improve the situation of ES for Noida.

Table 3: Summary of responses for the Brainstorming session

Group	Sl. No	Idea	How to implement	Who will Implement	Time Frame
1	1	Solid waste management	Separating degradable and non-degradable wastes at source.	Residents & Municipality	Continuous
	2	Proper sewage disposal	Treatment of sewage water from industries	Industries, Private Sectors. State Govt	3 years
	3	Water harvesting & management	Rainwater harvesting, watershed management. improved drainage.	Local people, Corporates, government	5 years
	4	Development of Green Belts & Green Spaces	Building parks, terrace gardening, vertical plantations, community forestry, avenue plantations, scientific planning	Landscape Engineers, NGOs, government, locals, corporations, Universities, corporations	4-5 years
	5	Management of Stray & Domestic Animals	Building animal sanctuaries and welfare bodies	Corporation, Local people, NGOs and responsible citizens	1-2 years
	6	Sustainable development of infrastructure	Green Buildings, Corridors for Wild Animals, Switching to renewable sources of energy.	Corporates, local people, MOEFCC	5 years
2	1	Treatment of Yamuna water	Treating sewage before dumping it in the river	Government, NGO's, industry	10 years
	2	Plantation	Education Awareness	NGOs, local people, education system (school)	5 years
	3	Wetland restoration	Reducing anthropogenic pressure & increasing floral diversity	NGOs government	3 years
3	1	Conduct a baseline study for the establishment of green spaces.	Involve environmentalists & urban planners and document the barren land.	Government and NGOs	1-2 year
	2	Study on wetland health	Involve local stakeholders through awareness programs and workshops.	Government	Once a year
	3	Implement sustainable farming around agricultural areas	Involve the Gram Panchayat and conduct awareness programs	Gram panchayat and gram Vikas Adhikari	Continuous practice
4	1	Environmental Impact Assessment	Involvement of Community, Government organizations, Departments, and research institutions.	Government department, municipality of G.B. Nagar, Local community	1-2 years
	2	Green Infrastructure	Partnership between Govt., the community		
	3	Establish strict environmental rules and regulations	increase the workforce of concerned departments and maintain the scrutiny of the laws in place	Forest department, local government with collaboration of local community and other private enterprises	1-5 years

Group	Sl. No	Idea	How to implement	Who will Implement	Time Frame
5	1	Wetland- Proper management of shoreline, conserving habitat for biodiversity, reducing the exploitation of resources (fishing).	Public awareness involving subject experts (environment, hydrology, and wildlife) Implementation of strict laws for wetland conservation	Forest department, Social Forest department, Municipalities and other local government bodies, Research institutes and NGOs	1-3 years
	2	Proper waste disposal (domestic)	Community awareness, provide alternate sewage treatment method	Local self govt. bodies, municipal cooperation	1-2 years
	3	Treatment of industrial sewage	Installation of treatment plants	Industries, Relevant government departments	2-3 years
6	1	Create awareness among the urban dwellers on ecosystem services provided and for conserving urban biodiversity	Weekly bird-watching trips Information/interpretation centre Law enforcement Urban dwellers meet on biodiversity. Guidelines for urban dwellers	Local authority/Noida Forest department NGO's Educational institutions Corporates	Throughout the project tenure
	2	Science-based creation of urban ecosystem development	Involve education institutions/ research institutions / local communities	Local authority and MOEFCC/ state/ central	Throughout the project tenure
	3	Creating a "sense of place" among urban citizen	Create awareness.	Local community	Throughout the project tenure

Annexure 1: Meeting Agenda



Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida

Consultation at Amity University

Date: 14th September 2023

Time: 1:00 PM- 5:00 PM

AGENDA

1:00 PM- 1:45 PM	Lunch
1:45 PM- 2:00 PM	Introductions by participants
2:10 PM-2: 30 PM	Background of ICLEI South Asia, LBSAP and the context of the meeting
2:30 PM- 3:00 PM	<u>Exercise 1: Scoping ecosystem services</u> Identifying the ecosystems of Noida
3:00 PM- 3:30 PM	<u>Exercise 2: Scoping ecosystem services</u> Which ecosystem services (ES) do the identified ecosystems provide for Noida? Where are they generated? How important are they? For whom? What is their current status and trend?
3:30 PM- 3:50 PM	Reporting back from the groups
3:50 PM- 4:15 PM	<u>Exercise 3: Improving biodiversity and ecosystem health</u>
4:15 PM-4:30 PM	Wrap up and way ahead
4:30 PM-5:00 PM	Tea and Snacks

Annexure 2: List of Participants

HCL Foundation



Development of Local Biodiversity Strategy and Action Plan for Noida Workshop and Scoping: Nature's Benefits in Noida

Meetings with Academicians

Name of the Institution: Amity University

Date: 14 September 2023

Time: 01:00 PM to 05:00 PM

Sl. No.	Name of Participant	Mobile Number	Signature
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HCL Foundation



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1.	Hiranmoy Chetan	9676348581	<u>Hiranmoy Chetan</u>
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HCLFoundation



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8.	Dr. Upamanyu Hore	8586015295	
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11.	Dr. Janmejay Sethi	8763522946	
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14	Dr. Ajay Malather	94110528026	



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**Proceedings of the Stakeholder Consultation
Workshop on the Development of a Local Biodiversity
Strategy and Action Plan for Noida**

Workshop and Scoping: Nature's Benefits in Noida

Hotel Eros, Delhi | 7 March 2024





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Description of the Project and Background to the Workshop

A Local Biodiversity Strategy and Action Plan (LBSAP) is an important tool for local governments to implement biodiversity conservation and action. LBSAPs focus on local implementation and need to be developed in both a scientifically informed and participatory manner to ensure that the communities who are direct beneficiaries of the plan have a role in its development and implementation. The LBSAP will help to mainstream biodiversity conservation into urban planning in the city. Critical blue-green infrastructure of the city will be identified and the threats to the same will be documented. It will lay out actions that need to be taken in order to improve the health of each of these critical ecosystems and the ecosystem services provided by the same. The LBSAP will also support in achieving the National Biodiversity Targets as well as the targets of the Post 2020 Global Biodiversity Framework.

The project will support Noida to understand and unlock, within its specific local context, the potential of nature to provide essential services and new or enhanced economic opportunities, while simultaneously protecting and enhancing the biodiversity and ecosystems on which these services and opportunities depend. Through the project, Noida will align their planning with their National Biodiversity Strategy and Action Plans (NBSAPs), which are required by the Convention on Biological Diversity (CBD) through the development of Local Biodiversity Strategy and Action Plans (LBSAP), which will be one of the few to be developed in India. This is being funded by the HCL Foundation.

New Okhla Industrial Development Authority, popularly called as Noida, is a planned city in the Gautam Buddha Nagar district in the state of Uttar Pradesh. The city is bound on the north-east, east and south-east by the River Hindon, on the west and south-west by the River Yamuna and on the north and north-west by Delhi and Ghaziabad respectively. It is enclosed under the catchment area of River Yamuna, which is composed of the rich river alluvium called khadar. The city falls within the Central National Capital Region (CNR) policy zone of the National Capital Region (NCR) (Sinha, 2018). It emerged as a satellite city of the capital of India, New Delhi, for the first time in 1991.

Noida is a rapidly urbanising city, forming a large part of the NCR (Sharma et al., 2021). The city is home to many corporate offices, residential buildings and commercial area. For the last several decades, Noida has grown rapidly with many construction activities taking place such as the building of skyscrapers, high rise housing apartments, setting up of new factories and the development of metro rail line across the entire city. The city has also witnessed extensive infrastructure development, for example, construction of Yamuna Expressway, the Rashtriya Dalit Prerna Sthal, Indian motor racing circuit, and Green Garden. This has impacted remnant natural ecosystems which are becoming fragmented, polluted and degraded.

There is an urgent need for the assessment and appreciation of the ecosystem services provided by biodiversity within and around city-regions and to formulate and implement sustainable strategies, which offset investments in conventional infrastructure that has high carbon lock-in and leverage ecosystem services in a sustainable and inclusive manner to make Indian cities safe and resilient. Decisions and actions that affect biodiversity are often taken at the local level, and hence corresponding strategies and action plans need to be developed and implemented at the relevant sub-national level.

The workshop aimed to discuss the following aspects with the participants:

- Develop the Vision statement
- Discuss and finalize the focus areas
- Identification of Health of Focus Areas
- Develop goals and key action plans
- Identify various stakeholders impacting ecosystem service delivery

Workshop Report

Elements of an LBSAP

Dr. Monalisa Sen in this session provided participants with an overview of the elements that make up an LBSAP. She first introduced ICLEI-Local Governments for Sustainability, the HCL funded project, explaining the purpose of the workshop. She then proceeded to explain India's international commitment as a party to the Convention on Biodiversity, the National Biodiversity Strategy and Action Plan, followed by why LBSAPs were important, what they were, who develops them, and why Strategies and Action Plans have relevance in an action plan. She explained the various elements that make up LBSAPs, detailing each level and how they align with each other (Figure 1). An explanation of ecosystems and ecosystems services was also provided. She referred to the outcomes of the previous stakeholder workshops held with research institutes and Resident Welfare Associations where seven focus areas were identified (Table 1) along with positive and negative drivers that affect them (Table 2).

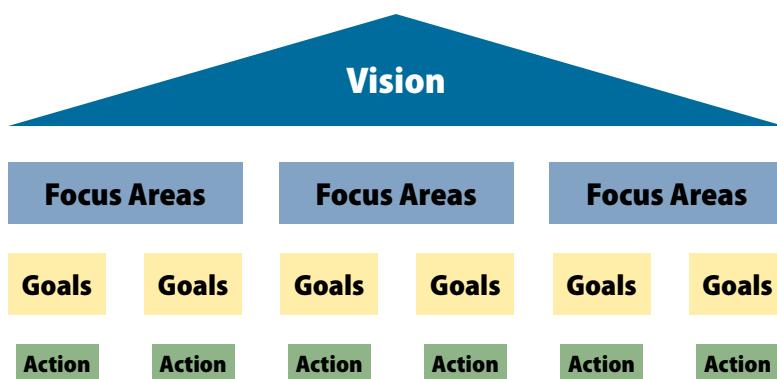


Figure 1: Elements of a strategy and action plan

Table 1: Focus areas identified in previous stakeholder workshops

Sl. No.	Focus Areas
1	River (Yamuna and Hindon) and Flood Plains
2	Avenue Trees
3	Okhla Bird Sanctuary
4	Kondli Irrigation Canal
5	Agriculture
6	Urban Forest
7	Parks and Gardens

Table 2: Drivers identified from previous Stakeholder Workshops

Focus Area	Drivers
River (Yamuna and Hindon) and Flood Plains	Pollution Soil contamination Over exploitation (fishing) Tourism Solid waste dumping Discharge of industrial effluents Eutrophication Encroachment Invasive species

Focus Area	Drivers
	Direct discharge of sewage Dysfunctional rainy wells Loss of traditional significance due to advent of road and rail networks Reduction in reliance of community for livelihood Infrastructure Development Flooding
Avenue Trees	Plastic waste dumping Non-native species Improper maintenance No connectivity between green spaces Concretisation of tree bases Road expansion
Okhla Bird Sanctuary	Pollution Urbanisation Eutrophication Invasive species High rise buildings in the vicinity Weed infestation Siltation Sound pollution from traffic Presence of high-tension power lines Absence of adequate spacing between trees
Kondli Irrigation Canal	Waste disposal Sewage disposal Clogging of canal
Agriculture	Use of chemical pesticides Land fragmentation Land use change
Urban Forest	Deforestation Land use change Population pressure Garbage dumping Light pollution
Parks and Gardens	Plastic waste dumping Invasive species Promotion of laser shows Dumping of construction waste Littering by visitors Unscientific selection of species Absence of guidelines for species selection Less biodiverse

With this, Dr. Sen split the participants into seven different groups for the group exercise sessions that followed. The group dealing with the Kondli Irrigation Canal stated that they were unable to work on that ecosystem as they had no knowledge on the same and therefore, they were shifted to other groups.

Exercise 1: Constructing the vision statement for the LBSAP

For this exercise Dr. Sen explained that a collective short descriptive statement of a desired future state – “mental picture” of where are we headed & want to achieve was necessary. The vision statement gives direction – anchor that prevents you getting lost, is inspirational, ambitious but realistic and succinct, clear & easy for all to understand & visualise.

This was done as a collective exercise and the following is the vision statement agreed upon by the participants

“Noida envisions a future where ecological conservation is seamlessly integrated with economic growth, creating an inclusive, sustainable and resilient city that fosters prosperity and wellbeing for all its inhabitants, through the application of scientific knowledge, conservation and stewardship.”

Exercise 2: Finalisation of focus areas and assessment of their health

Dr. Sen explained to participants how planned, deliberate and focused efforts were needed to achieve the Vision which would reflect priorities, help to create a common sense of purpose. She warned that too few would show a lack of clear focus & vagueness while too many were difficult to focus on.

- The main objectives of the exercise were to identify
- Discuss and finalise the focus areas identified in the previous stakeholder workshop
- Score the health of each of these focus areas

Each group was given a sheet with the focus area and its identified drivers and asked to score the impact of the driver on the health of the ecosystem with a score of 1 corresponding to an impact of poor health and a score of 5 corresponding to an impact of good health. Against each driver, participants were also asked to identify what they thought could be indicators for that particular driver. The summary of responses is given below in table 3.

Table 3: Exercise assessing health of the focus areas

Group No	Ecosystem	Drivers (impacting ecosystem health)	Health status*	Indicators
1	River (Yamuna and Hindon) and Flood Plains	Soil Pollution	3	Illegal waste dumping (plastic, C&D, Hazardous)
		Water Pollution	1	Discharge of industrial waste and untreated sewage
		Air Pollution	2	Release of noxious gases like nitrogen and ammonia from open drains, Cremation activity
		Overexploitation	5	-
		Tourism	4	-
		Discharge of Industrial Effluents	1	Discharge of industrial waste and untreated sewage
		Encroachment	1	Illegal construction around Hindon, Illegal farming
		Solid Waste Dumping	3	No segregation; dumping of waste into river
		Invasive Species	2	Hyacinth, Catfish have increased
		Flooding	2	Due to illegal construction, waste dumping and sand mining
		Infrastructure Development	1	Construction of unauthorized colonies and development

Group No	Ecosystem	Drivers (impacting ecosystem health)	Health status*	Indicators
		Direct Discharge of Sewage	2	Discharge from construction on flood plains
		Linear infrastructure	3	Construction of bridge on the rivers and dumping waste
		Eutrophication	1	Bad water quality
2	Urban Forest	Afforestation	4	Number of trees
		Infrastructure expansion	1	Acre of land
		Population Growth	1	Percentage increase in population
		Increased dependency on resources	1	Frequency of movement
		Garbage dumping	1	Plastic pollution
		Biodiversity Enrichment	4	Biodiversity Visible
		Land Encroachment	1	Acre of land
		Green Belts	4	Number of green belts converted to urban forest
		Unscientific plantation	1	Number of invasive trees planted
		Air Quality	4	Decrease in carbon dioxide
3	Parks and Gardens	Unscientific species selection	4	Health risk increasing, loss of native biodiversity, monoculture
		Waste dumping	3	Soil and microbial quality, animal and plant health, aesthetically displeasing
		Littering	2	Aesthetically displeasing
		Lack of scientific approach	1	Lack of proper training, Unplanned development
		Lack of biodiversity documentation	3	Lack of PBRs
		Stray animal nuisance	4	Ecosystem quality
4	Agriculture	Use of chemicals	1	Water quality
		Land fragmentation	2	Decrease in yield, potential of plant, reduce machine use
		Land use change	1	Urbanisation, animal-human conflict, pollution
		Contaminated water	1	Heavy metal contamination
5	Okhla Bird Sanctuary	Water Pollution	2	Bad chemical quality of water
		Urbanisation/ Anthropogenic pressures	2	Land use change, concretization
		Eutrophication	2	Increase in methane, aquatic die-offs, algal blooms, increase in Daphnia
		Invasive species	1	water hyacinth and cat fish
		High rise buildings in the vicinity	3	Obstruction for migratory species
		Weed infestation	2	Pistia increasing
		Siltation	2	Decrease in water levels leading to loss of aquatic life
		Noise pollution	1	Chronic stress of migratory fauna
		High tension power line	1	Increased mortality of birds
		Absence of adequate spacing between trees	3	
		Air pollution	1	Methane, exhaust, poor AQI

Group No	Ecosystem	Drivers (impacting ecosystem health)	Health status*	Indicators
		Poaching and hunting	2	Fishing and bird hunting
		Tourism pressure	3	Increase in visitor numbers
		Flood Management	4	Safety and cleanliness
		Documentation of flora and fauna	3	Records of flora and fauna especially non avian species
6	Avenue Trees	Unplanned concretisation	2	Uneven stunted growth
		Non-removed tree guards	1	Uneven stunted growth
		Irregular pruning	2	Improper growth
		Unplanned avenue plantation	3	Issues in beautification, Sudden leaf shedding of trees, easy spread of plant disease
		Non-native species plantation	2	Non compatibility with the landscape, early degradation of trees
		Waste management	1	Waste residue in the soil
		Lack of connectivity of green spaces	3	Reduction of the habitat range/radius of the birds, visible barren patches
		Road expansion	2	Falling down/removal of trees, irregularities of tree stretch
		Lack of awareness on biodiversity enhancing species	3	Irregular and incompatible tree species planted
		Community led environmental initiatives	5	Biodiverse space, healthy tree growth

Exercise 3: Goals and Key Actions

Dr. Sen explained to participants that for this exercise, the goals needed to align with the identified focus areas. They are the “heart & soul” of the strategy as they give content to the Vision & Focus Areas. These are well-defined targeted statements that give clarity & direction being S.M.A.R.T (Specific, Measurable, Achievable, Realistic and Time-bound). They encompass a clearly defined outcome & deadline and form the basis for measuring progress & performance. She asked participants to develop between 2 – 4 goals per Focus Area along with actions that could achieve the goal. Each group was given two focus areas and asked to come up with goals and actions for these areas as detailed in Table 4.

Table 4: Summary of responses for Exercise 3

Group	Focus Area	Goals	Key actions	Responsibility	Time Frame
1	River (Yamuna and Hindon) and Flood Plains	Waste Management	Monitoring illegal dumping	RWA, ADA, Noida Authority,	Moderate term
			Prevention of effluent discharge in river	Irrigation Dept., Pollution control board, NGOs	5 years
			C&D waste management	Noida Authority, Planning dept., Police, Irrigation Dept., Flood and Relieve Dept., NGOs	Immediate
			Covered drains	NGO, CMO, RWA, Authority	1-3 years
		Prevention of water pollution	Electric cremation promotion	NGO, CMO, RWA, Authority	1-3 years
			Construction of effluent treatment plant in every industry to treat water before discharge	PCB, MSME, Noida entrepreneur board	1-3 years

Group	Focus Area	Goals	Key actions	Responsibility	Time Frame
			Constructed wetlands in each society	PCB, Irrigation dept., RWA, NGOs, Biodiversity Board, Wetland Board	5 years
		Removal of encroachments	Control encroachment on or near flood plain	Police, Irrigation dept., Forest Dept., Noida Planning dept., DM	1-3 years
			Demolish encroachments	Police, SDM, NGOs, Authority, SPCB	Immediate
		Removal of invasive species	Removal of water hyacinth	RWA, NGOs, Authority	1-3 years
		Sustainable growth	Arrest sand mining	SDM, DM, Planning dept.	Immediate
			Re-evaluating master plan	SDM, Police, NGOs	Immediate
			Implementing of zoning laws	SDM, Police, NGOs	Immediate
		Arrest eutrophication	Cleaning of river to prevent eutrophication	SPCB, State Biodiversity Board, NGOs, Noida Authority, Irrigation Dept.	1-3 years
			Introduction of aquatic species that can combat eutrophication		
		Improve biodiversity databases	Documentation of biodiversity activity on flood plains	RWA, village, tehsildar, NGOs	5 years
2	Urban Forest		Native Plantation	Schools, colleges, institutions, RWA corporates, Forest Dept.	2030
			Water body creation	NGOs, volunteers, corporates, Jal board, Local bodies, Experts	20218
			Nest boxes	Ecoroots, Noida Authority, Researchers	1-2 years
			Insect hotels	Give me trees, Green yatra	2025
			Pollinator gardens	NGOs and field experts	2027
			Removal of invasives	Noida Authority, horticulture dept., key professionals	2025
			Soil enrichment using organic methods	RWAs, agriculture dept.	2028
			Waste management	Noida authority, organisations working on waste recycling	2027
			Home nursery development	Local residents, RWAs	2025
			Waste water treatment	RWAs, schools, hotels and various institutions	2027
			Rain water harvesting	RWAs, NGOs, Individuals	2025
			Scientific plantation	Forest Department and relevant experts	
			Alternate livelihoods	Locals, residents, institutes, NGOs	
			Infrastructure streamlining	Noida Authority	
			Sustainable action plan	Municipal corporations	

Group	Focus Area	Goals	Key actions	Responsibility	Time Frame
3	Parks and Gardens	Biodiversity Enrichment	Scientific plantation	Forest Dept	2 years
			Involvement of local stakeholders in data collection to develop baseline	Researchers, experts, institutions, agriculture bodies, NGOs	2 years
		Prevent Land encroachment	Better implementation of rules and the involvement of RWAs to this use	Noida Authority, Police, RWA, Planning Depts., Research institutions	1-2 years
			Land use planning		2-4 years
		Improve AQI	Plant pollution tolerant species	RWAs, Builder Associations, Planning Authorities, Professional bodies (architects, planners), R&D	
			Dust reduction technologies in construction and traffic		2 years
			Native plantation		
			Changes to building bye laws		
		Addressing unscientific selection of species	Listing of native species	Local NGOs, education and research institutes	5-10 years
			Developing a nursery of native species	Noida Authority	10-20 years
			Scientific awareness	Educational and research institutions	20 years
			Interpretation center	Educational and research institutions, CSRs	5 years
		Waste Management	Hefty fines and legal reforms	Authority and line depts.	5 years
			Urban planning	Urban planning dept.	20 years (continuous)
			Zero waste policy	Corporations and CSRs	10-20 years
			Sensitization and education	Schools, Noida Parks Authority, NGOs, RWAs	20 years
			Renewable resources used in logistics	CSR project	10-20 years
			Community involvement	Community, NGOs	5 years (Continuous)
		Improving scientific approach in management	Planned Manpower	Educational institutes, research institutes	5-10 years
			Workshops (eg taxonomy)	Educational institutes, research institutes	5 years
		Strengthening Biodiversity Documentation	Documentation of local biodiversity	Educational institutes, research institutes, Citizen science initiatives	5-10 years
			Interpretation and digital display centers		5-10 years
		Stray animal management	Removal of stray animals	NGOs, Animal welfare organizations	5 years

Group	Focus Area	Goals	Key actions	Responsibility	Time Frame
4	Agriculture	Promote organic/bio-/natural farming	Provide training to farmers on use of organic methods	Dept. of Agriculture, NGOs, Community, Farmer collectives, SHGs	5-10 years
		Provide pest-resistant crop seeds and plants	Provide pest-resistant crop seeds and plants	Dept. of Agriculture, Research Institutes	5-10 years
		Address fragmentation and land use change	Promote Cooperative farming and consolidation of land holding	Revenue Department, FPOs	5-10 years
			Laws that prevent land use change	Noida Authority	5-10 years
			Promote multistorey houses and avoid farm houses	Noida Authority	5-10 years
		Make Agriculture profitable	Promote cash crops, mushroom farming, ornamental floriculture in polyhouses	Dept of Agriculture, Government Research institutions	5-10 years
			MSP to farmers for growing certain crops		5-10 years
			Creation of market niches		5-10 years
		Treatment of contaminated water at source	Laws that prevent release of contaminated water into rivers and fields	Government of UP, Noida Authority, NGOs	3-5 years
5	Okhla Bird Sanctuary	Containment of water pollution into sanctuary	Treatment of water before discharge	Industries and Local authorities	5 years
			Constructed wetlands	MCD and Noida Authority, in partnership with CSOs	5 years
			Phytoremediation	Forest Dept in partnership with CSs, UP Irrigation dept.	5 years
		Controlling impacts of urbanization	Proper demarcation of catchment and flood plains	Revenue dept., in consultation with Forest Dept. and UP Irrigation Dept	2 years
			No construction zone declared		
		Invasive species control	Season specific action plan	Committee consisting of Tourism Dept., Scientists, CSs, Ornithologists, Noida Authority, Irrigation Dept.	Annual
			Remove weed infestation		
		Management of Silt	Silt management committee to monitor and execute scientific management of silt	Delhi and Up Govts. Scientists, Delhi Jal Board, Irrigation dept., Noida Authority	Regular annual activity
		Reduction of noise pollution	Declare DND as a non-honking zone	Delhi and UP PCB, UP traffic police	1 year
			Sound Barriers around OBS	Delhi and UP PCB, UP traffic police	1 year
		Mitigating impacts of high-tension wires	Covering high tension wires/insulation	Electricity dept (UPPCL), Ministry of Power, Grid Authority	1 year
		Air pollution reduction	Reduce methanisation by the above-mentioned measures		
		Reducing poaching and hunting	Strengthening patrolling system by strengthening frontline staff capacity	Forest Department, DFO, CSOs	2 years

Group	Focus Area	Goals	Key actions	Responsibility	Time Frame
			Community awareness and Community led conservation	Forest Department, DFO, CSOs	2 years
		Ecotourism	Recruiting nature guides	Forest Department, DFO, CSOs	2 years
			Improving signage and developing a nature interpretation center	Forest Dept., CSR, CSOs	1 year
			Documentation of the status of flora and fauna	State Biodiversity Board, Schools and universities	2 years
6	Avenue Trees	Beautification of area	Guidelines for the concretization of trees	Noida authority	1+1 year
			Transparent clear information sharing	RWAs, Local authorities, NGOs	1 year
		Habitat enhancement for local biodiversity	Knowledge on the removal of tree process	Zonal Area head, RWA	1 year
			Open channel for post removal process	Local Authorities, NGOs	1 year
		Green spaces improvement	Guidelines for the tree or species-specific removal process	Zonal Area head, RWA	1 year
			Post removal communication channel	Local Authorities, RWA	2 years + till completion
		Water Retention	Consultation of experts and development of local-specific guidelines	Relevant stakeholders	2 years + till completion
		Air quality improvement	Consultation of experts and development of local-specific guidelines	Relevant stakeholders	1 year\ continuous
		Waste management improvement	Location specific community programme	RWA, Schools, Community volunteers	1 year
			Defined monitoring process for waste segregation	Noida Authority	1 year + continuous
			Strict waste management plan for public areas	Location specific authorities	1 year
			Upcycling and revenue generation from waste generated from open drainage system	Relevant authority	Continuous
			Translocation of trees impacted by road widening	Relevant authorities	Continuous
		Improve awareness and education	Mainstreaming environmental education in schools and education system	Schools, BSA, Education Authorities	3 years
			Continuous environment awareness for communities	RWA	Continuous
			Participatory approach of local communities and authorities	NGOs, relevant authorities	3 years
			PBR development: Biodiversity assessment and traditional knowledge documentation	Experts, Academicians and researchers	3 years
			Formation of Biodiversity Management Committee	State Biodiversity Board	3 years

Participants strongly felt that a situation analysis was missing for the city and there was a distinct lack of trained (human) resources.

Exercise 4: Understanding activities and actors

In this second exercise, the activities which influence the provision of relevant ES were explored. Participants were encouraged to identify which actors are involved and to classify the actors and activities as benefitting, stewards and degrading to a particular Ecosystem Service. The outcome of the session was for a joint understanding of how activities and actors relate to ecosystem service provision. Below is a summary of the groups' responses

Table 5: Summary of responses for Exercise 4

Group	Stewardship		Benefitting		Degrading	
	Activity	Actor	Activity	Actor	Activity	Actor
Urban Forests	Removal of invasive species	Forest Dept., Horticulture Dept., Noida Authority, State Govt.	Religious, festivals, cultural identity	RWA, Citizens	Improper maintenance	Nearby communities
	Selection and plantation of species	Forest Dept. University and research institutes, CSR wings of companies, NGOs	Ecotourism	Schools, university, society	Increased level of air pollution	General public
	Waste management	Institutes, Public Private, Irrigation dept.	Education	Students, nature enthusiasts	Improper waste disposal	Community
			Carbon foot print	Society, state	Invasive species	Noida authority, horticulture dept.
			Water recharge	Institutes, government	Encroachment	Noida Authority, Police
			Soil, water regeneration	Citizens	Water logging	
			Pollination, flora, fauna	Citizens	Development threats	Planning dept. Noida Authority
			Biological control of food chain	Pubic, citizens	Change in Land Use	Planning dept. Noida Authority
			Bird watching	Students, nature enthusiasts	Discharge of contaminated water and waste	Industries and citizens
River Hindon and Yamuna, Flood plains	Plantation along the river	Horticulture dept., forestry, NGOs, Irrigation, Local community, DM	Medicinal plants	Community, Ayurveda industry	Encroachment on flood plain	Community
	Arresting sand mining	Police, DM, Tehsildar, Irrigation Dept.	Clean water	Farmers, local community, fishermen, irrigation dept., tourism, residents	Increase of grey infrastructure on surface	Increasing population
	Prevention of contaminated water into river	Irrigation dept., PCB, DM, Noida Authority	Flood plains	residents	Dumping of C&D waste on flood plain	Construction industry, Housing societies

Group	Stewardship		Benefitting		Degrading	
	Activity	Actor	Activity	Actor	Activity	Actor
	Soil profile studies	RWAs, local communities, DM, CMO, NGO	Water Table restoration	Community, Noida Authority, NGOs	Sad mining	Brick Kiln Industry, Construction industry
	Awareness programmes	NGOs, Noida Authority, Central govt.				
Avenue Trees	Plantation of trees	Local authorities, CSRs, NGOs, RWA	Air quality	Local residents	Concretizing	Local authorities involved in plantation
	Maintenance of trees	Local authorities, CSRs, NGOs, RWA	Water retention		Littering	Residents
			Improving habitat of urban biodiversity		Improper pruning	Authorities responsible for maintenance
			Demarcation		Road expansion activities	Town Planners and authorities
					Grazing of non-guarded saplings	Husbandry dept., local community
Agriculture	Organic farming, crop rotation practices	Farmers, Govt of UP, NGOs, research Institutions	Soil, environment and climate change	Farmer, Public	Pesticides and chemical fertilizers	Farmers, government
Parks and Gardens	Nursery establishment	Agriculture dept.	Scientific park planning	Students, Managers	Overcrowding and related issues (trampling of vegetation, collection of NTFP)	Park visitors
	Scientific awareness	Education and research institutes, NGOs	Development of genetic resources			
	Interpretation centers	Education and research institutes, CSR	Workshops, awareness sessions	Students, local community		
	Hefty fines and legal reforms	Authority and line departments	Knowledge sharing	Students, local community		
	Urban planning	Urban Planning Dept.	Revenue generation for park management	RWAs, authorities		
	Zero waste policy	Corporations, CSR	Planned development for improved quality of life	RWAs, authorities		
	Sensitization and education	Schools	Aesthetics	RWAs, authorities		
	Renewable resources used in logistics	CSR agencies	Sustainable transport			
	Community involvement	Community, NGOs	Improved quality of air, water, soil	People		

Group	Stewardship		Benefitting		Degrading	
	Activity	Actor	Activity	Actor	Activity	Actor
Okhla Bird Sanctuary	Awareness through digital means	Noida authority, NGOs				
	Planned man power	Education and research institutes				
	Workshops	Education and research institutes				
	Documentation of local biodiversity	Education and research institutes				
	Stray animal removal	NGOs, Animal Welfare organizations				
Okhla Bird Sanctuary	Water treatment	Industries association, MCD, Noida Authority, CSOs	Water Quality (improved), irrigation	Farmers, irrigation dept., local community, Forest Dept., Tourism, Park Authority	Sewage and effluent discharge, pesticides	MCD, Noida Authority, Farmers
	Demarcation of flood plains	Revenue dept., State Forest Dept.	River and aquifers improved	Local community, tourism	Construction work (linear and other infrastructure)	Developers, Local Authority, Landless labour population
	Management of invasive species	Forest Dept., State Biodiversity Board, CSOs, Academic institutions, Scientists	Improved habitat for fauna	Tourists, local community, authority	Dumping waste	local community, forest dept.
	Non-honking zone	Local community, Travelers, Traffic police, State Pollution Control Board	Educational training and workshops	Education dept., Institutions	Noise pollution from vehicles	Tourists, State Traffic police
	Controlled tourism	State Tourism and Forest Dept.	Exposure trips	Forest Dept., Frontline workers	Cattle grazing, poaching and hunting	Local community, Husbandry Dept., Authorities

Exercise 5: Defining the Vision

Vision statement for the LBSAP were discussed. The participants came up with a few suggestions, which were deliberated upon. The final statement that was agreed upon is as follows

Noida envisions a future where ecological conservation is seamlessly integrated with economic growth, creating an inclusive, sustainable and resilient city that fosters prosperity for all its inhabitants, prioritising holistic protection and restoration of ecosystems.

Closure Session

The way forward was discussed in the final session. Participants also emphasised on the need to address the issue of dearth of taxonomists in the next generation as an immediate concern. Dr. Sen then thanked the participants for their time.

Annexure 1: Workshop Agenda



Development of Local Biodiversity Strategy and Action Plan for Noida

Workshop and Scoping: Nature's Benefits in Noida

Date: 7th March 2024
 Venue: Viceroy Hall, Hotel Eros, Delhi

Program Schedule

Time	Item
Thursday, 7th March 2024	
Objectives: Introduce the ES concept and its applications; exercise to apply ES thinking to Noida's critical ecosystems; collect ideas on how to improve the situation, generate awareness, build capacity and ensure stakeholder buy-in for the project	
9:00-9:30	Registration
9:30-10:00	Welcome and Introductory Remarks
10:00- 10:45	Introduction to the HCL Foundation supported project and the work done so far
10:45-11:00	'What is an LBSAP?'
11:00-12:00	Exercise 1: Scoping ecosystems: health status and drivers <ul style="list-style-type: none"> • Which are the critical ecosystems in Noida? • What is their health status? What are the drivers impacting their health? <i>Desired outcome:</i> <ul style="list-style-type: none"> • Identification of critical ecosystems • Defining ecosystem health and drivers impacting the same
12:00- 12:15	Short input: Ecosystem service opportunities
12:15- 1:30	Exercise 2: Developing the goals and action points <ul style="list-style-type: none"> • What are the goals and action points for each critical ecosystem identified <i>Desired outcome:</i> <ul style="list-style-type: none"> • Identification of focus area specific goals • Identification of action points for each goal
1:30- 14:00	Lunch break
14:00-15:00	Exercise 3: Understanding activities and actors
	<ul style="list-style-type: none"> • Which activities influence the provision of relevant ES? Which actors are involved and how? • Where do trade-offs between ES occur and how? <i>Desired outcome:</i> <ul style="list-style-type: none"> • Joint understanding of how activities and actors relate to ecosystem service provision by the identified ecosystems • Systematic scoping of actors (also in template) as entry points for initiating a change process
14:00-15:30	Reporting back from groups and synthesis
15:30-15:45	Coffee break
15:45-16:30	Exercise 4: Defining the vision statement <i>Desired outcome: A shared vision statement for the Local Biodiversity Strategy and Action Plan</i>
16:30-17:00	Discussion results and synthesis

Annexure 2: Participant List

HCLFoundation



Development of Local Biodiversity Strategy and Action Plan for Noida

Workshop and Scoping: Nature's Benefits in Noida

Date: 7th March 2024 | Venue: Viceroy Hall, Hotel Eros, Delhi

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