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City Biodiversity Index – Noida

Prepared under HCL Foundation Supported Project entitled "Promoting Conservation and Sustainable Management of Urban Biodiversity in Noida".

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Abbreviations

BGIR	Botanic Garden of India Republic
CBI	City Biodiversity Index
CBSE	Central Board of Secondary Education
°C	Degree Celsius
cm	Centimeter
COP	Conference of Parties
CSR	Corporate Social Responsibility
ha	Hectare
IBA	Important Bird Area
ICSE	Indian Certificate of Secondary Education
LBSAP	Local Biodiversity Strategy and Action Plan
NCR	National Capital Region
NGO	Non-Governmental Organisation
OECM	Other Effective area-based Conservation Measures
RWA	Resident Welfare Association
SCBD	Secretariat for the Convention on Biological Diversity

Section I: About City Biodiversity Index

The City Biodiversity Index (CBI) or the Singapore Index was developed in 2008, when it was acknowledged in the Ninth Biodiversity Conference of Parties (CoP) that cities and local bodies can support the implementation of a country's National Biodiversity Strategy and Action Plan (NBSAP).

The index consolidates the available biodiversity-related indicators locally, which can help cities evaluate and benchmark their biodiversity conservation and governance efforts. CBI scoring is quantitative in nature. A total of 23 indicators makes up the index, measuring a city's native biodiversity, the ecosystem services provided and biodiversity governance. Scores range between zero to four points for each indicator, with a maximum overall score of 92. The first year is considered the baseline against which cities can then chart their subsequent evolution.

According to the Secretariat for the Convention on Biological Diversity (SCBD)[i], some of the benefits that cities derived from the application of the index include "a) the process facilitated capacity-building in biodiversity conservation, b) the indicators also function as biodiversity conservation guidelines and c) assistance in setting priorities for conservation actions and budget allocation through quantitative scoring".

The CBI of Noida was developed by ICLEI- Local Governments for Sustainability, South Asia in collaboration with HCL Foundation.

i. Secretariat of the Convention on Biological Diversity. (2014). User's manual on the Singapore Index on Cities' Biodiversity (also known as the city biodiversity index). Available at: http://www.cbd.int/en/subnational/partners-and-initiatives/city-biodiversity-index. Accessed online on 22 November 2019.

Summary of the Scores

The CBI of Noida, 2023 has been prepared based on the SCBD endorsed user's manual for CBI updated in 2014. The 23 indicators that make up the index are grouped into three main components viz. Native Biodiversity, Ecosystem Services provided by Biodiversity and Governance and Management of Biodiversity.

The city scored a total of 30 out 72 for 18 indicators (refer Figure 1). Since this was the baseline year the indicators 4-8 were not considered for the analysis. The first section on "Native Biodiversity in the City", contributed to a score of 12 out of 20 as only 5 indicators were taken into consideration. The city scores fairly in this section, indicating that portions of its natural habitat represented by its riverine habitats, natural vegetation supports biodiversity. Indicators 11-14, which relate to "Ecosystem Services provided by Biodiversity in the City" scored 6 out of 16 points. The city scores below average here which indicates that the health of the ecosystems needs to be improved to augment ecosystem functions. This is especially important since most of Noida's natural habitats are impacted by anthropogenic activities. Indicators 15-23, which correspond to "Governance and Management of Biodiversity in the City" contributed to a score of 12 out of 36 points. This is a low score, indicating that biodiversity matters need to be mainstreamed into urban planning.

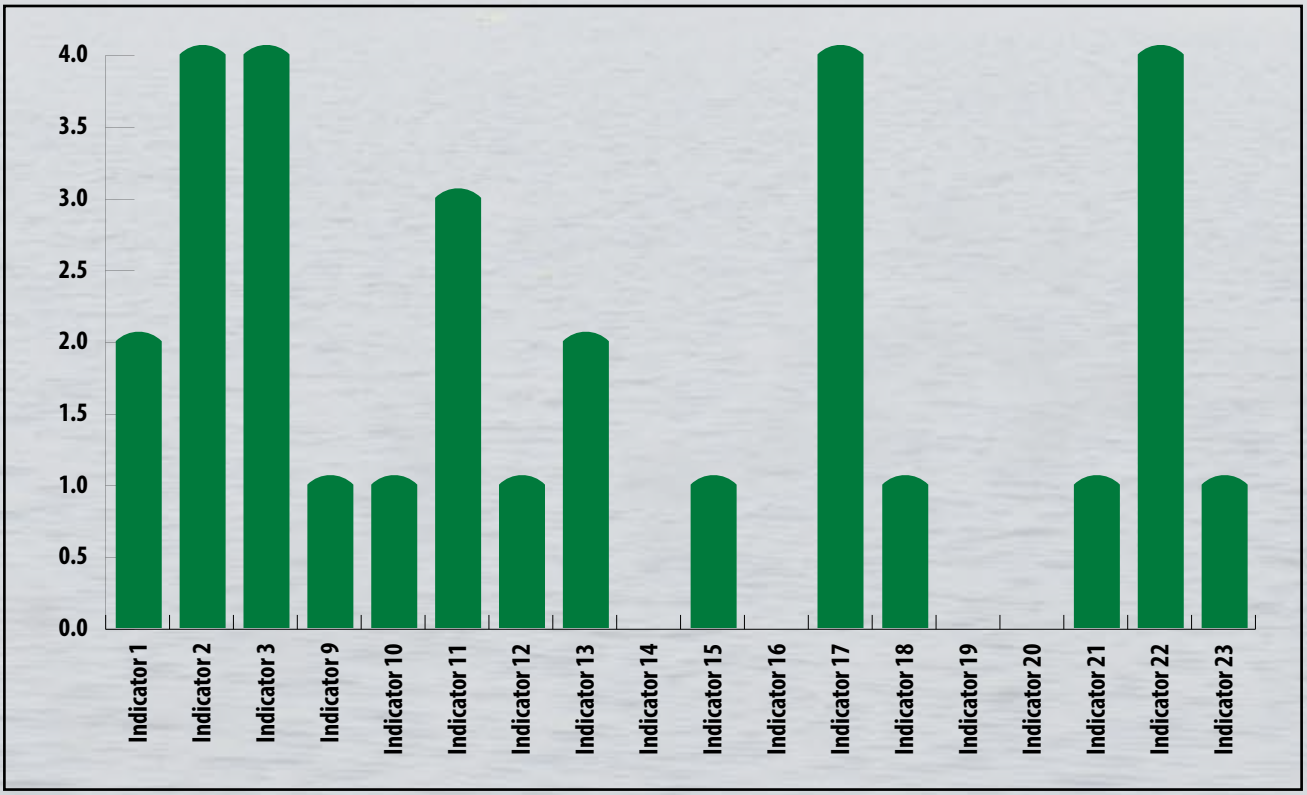

Figure 1: Noida City Biodiversity Index 2023 at a Glance

Section II: City Biodiversity Index of Noida

Part A: Noida City Profile

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°18'12.54" to 28°22'36.72" northern latitudes and 77°10'28.97" to 77°15'19.83" eastern longitudes [1]. Noida is spread over an area of 235 sq.km, at an elevation of 200 metres above sea level. It is situated in the Trans-Yamuna area. The city is comprised within the Central National Capital Region (CNCR) policy zone of the National Capital Region (NCR) [2]. It emerged as a satellite city of the capital of India, New Delhi, for the first time in 1991. Noida experiences a hot and humid type of climate [3]. Summers last from March to June with maximum temperatures of up to 45^{0}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^{0}C in December-January. The city also receives winter rainfall in the month of February due to western disturbances.

Geographical Characteristics

Noida is located north of Delhi in the Bisrakh Census Development Block [1] 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 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 [4]. 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, Noida is at a lower elevation than the surrounding area and the flood plain of River Yamuna. Consequently, the city is not well-equipped for effective storm water and sewage disposal.

Demography

According to Census of India 2011 [5] report, 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 [5]. There are 553,545 (86.86%) Hindus while Islam is the second most widely followed religion with approximately 8.55% people practising it. Other popular 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'.

Economy

Noida is a rapidly urbanising city, forming a large part of the National Capital Region (NCR) [6]. The city is home to many corporate offices, residential buildings and commercial areas. 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 and Indian Motor Racing Circuit.

Since its inception in 1976, the city of Noida has grown tremendously well in various sectors including services, business enterprise and real estate [4]. About 29.47 percent of total workers comprised of industrial workers in 1991 [4]. Other workers included about 14.54 percent 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. In addition, a large proportion of 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 1,267 hectares of industrial land was fully established [4]. The city attracts both domestic and international tourists for its cosmopolitan fabric as well as opportunities in sports and recreation.

Biodiversity

Vegetation in Noida falls in the category of sub-tropical deciduous type however, the city does not possess any natural forests [4]. 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 (*Acacia nilotica*). There are also scrubs and bushes found in the region characterised by species such as Arua (*Ailanthus excelsa*), Hina (*Lawsonia inermis*), Madar (*Calotropis gigantea*), Karauda (*Carissa carandas*) and Mako (*Solanum nigrum*).

An important natural habitat that remains 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 [7]. 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* [8]. The Sanctuary plays a significant role as a breeding and/or feeding site for the water birds.

Urban green areas like parks also host some biodiversity. Shaheed Bhagat Singh Park is spread over 40 acres and is home to about 2,000 trees and 75,000 shrubs including various ornamental and fruit species such as mango, jamun and neem [9]. Noida's largest park, the Biodiversity Park, Sector 92 is spread over 75 acres and has 4,322 native trees and 19,625 ornamental trees [10].

ICLEI South Asia under the HCL Foundation supported project, 'Promoting conservation and sustainable management of urban biodiversity in Noida' has developed a Natural Asset Map (Figure 2) of Noida city. The map primarily highlights natural and urban green-blue spaces of the city which in this case are represented by the land classes given in Table 1. Of the various natural and urban green-blue spaces, agricultural land takes up 25% of the total land classes, followed by the Yamuna River at 5.3%.

Table 1: Natural Asset Land Classes represented in the Natural Asset Map of Noida

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 (wetland cultivation)	4865.13	20.66
15	Mixed cultivation	1077.90	4.58

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 [11] The Botanic Garden is home to more than 900 plant species including herbs, shrubs, trees and climbers. A number of 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* [12]. Some of the medicinal plants also 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* [13].

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 cymose* [7].

Out of the total 220 algal taxa present in the entire stretch of river Yamuna, *Xanthophyceae* and *Dinophyceae* are two prominent families present in the Noida stretch of the river [14]. Two species of *Euglenophyceae* are also found in this stretch.

Fauna

Okhla Bird Sanctuary is a haven for birds. There are about 302 bird species, of which 131 are local, 121 are aquatic and 50 are migratory [15]. eBird (2023), a citizen science platform records 340 species.[ii]

A waterbody in Botanic Garden of Indian Republic, situated in Noida was developed to conserve aquatic biodiversity including endemic and threatened plants of different habitats under ex-situ conservation [16]. 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), *Ardeola grayii* (Pond Heron) and *Vanellus indicus* (Titeeri).

In an attempt to document the campus biodiversity, Amity University recorded 46 species of lepidopterans [17]. The presence of a little-known, extremely rare wasp in Noida, *Pison punctifrons* has been recorded [18].

The zooplankton community in the Noida stretch of river Yamuna is represented by 18 order and 196 taxa [14]. Zooplanktons 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 [19].

Administration of Biodiversity

In the city of Noida, biodiversity is administered by the following state and city level agencies.

Environment, Forest and Climate Change Department: This State Department, headed by the Principal Chief Conservator of Forests and Head of Forest Force, is responsible for conservation of forests and biodiversity, carry out large scale plantation for increasing the green cover and implement sustainable harvesting of goods and services from biological resources. In addition, the department aspires to involve public in conservation measures and promote public-private partnership. For more information, please visit: http://upforest.gov.in/web/forestnew/default.aspx

Uttar Pradesh State Biodiversity Board: The State Biodiversity Board was 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: This Authority was established under the U.P. Industrial Area Development Act, 1976. Since its inception, it has been responsible for the development of the city of Noida with state-of-the-art infrastructure, in the lines of Grid-Iron concept in engineering, urban planning and architecture. Headed by the Chairman, the city authority has also laid out an environment and quality policy to develop the city of Noida as a green haven. For more information, please visit: https://noidaauthorityonline.in/

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

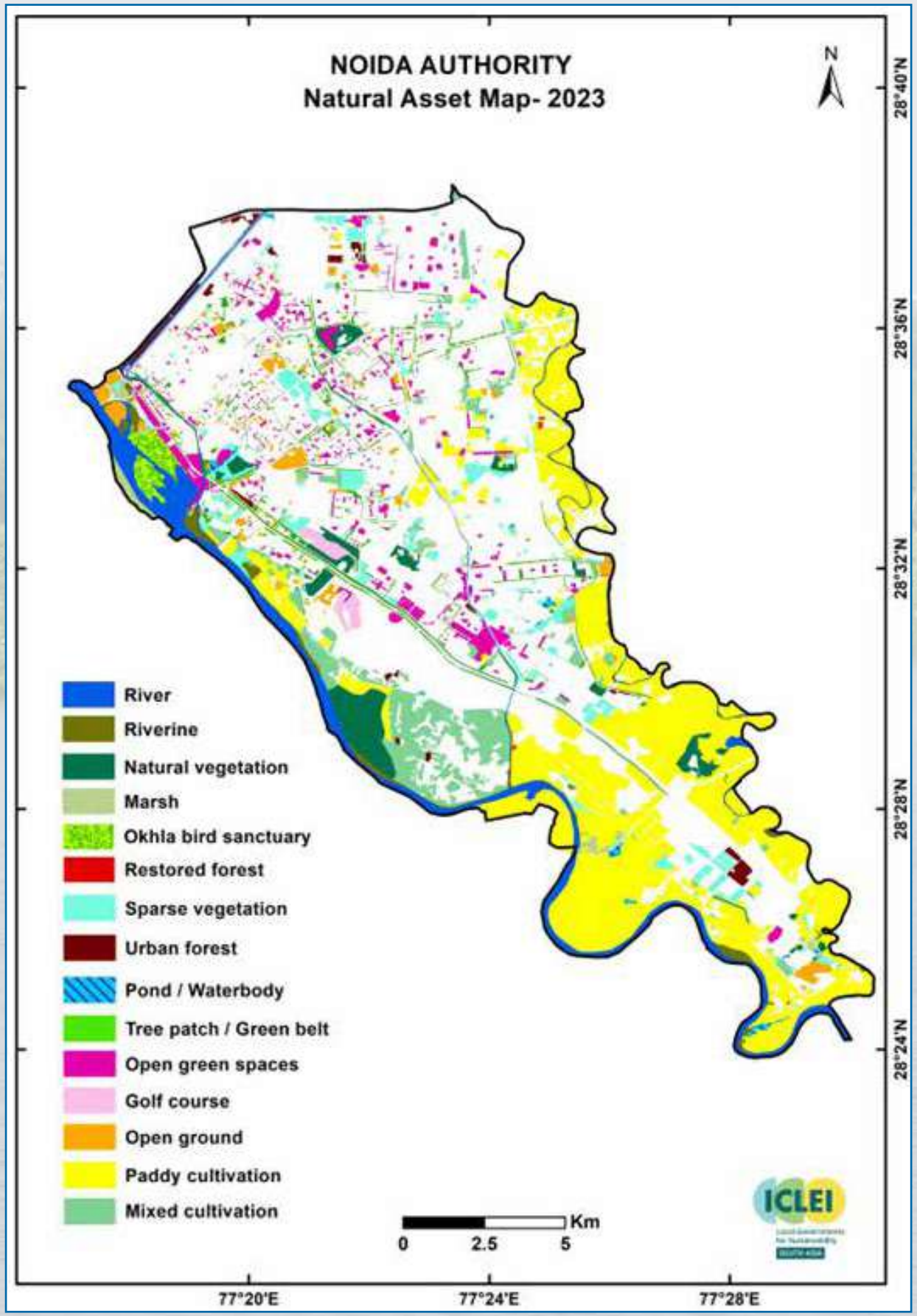

Figure 2: Natural Asset Map of Noida

Part B: Indicators of the Singapore Index on Cities' Biodiversity

Native Biodiversity

Indicator 1: Proportion of Natural Areas in the City

According to the Singapore Index Manual, natural areas are defined as "Natural areas comprise predominantly native species and natural ecosystems, which are not, or no longer, or only slightly influenced by human actions, except where such actions are intended to conserve, enhance or restore native biodiversity."

Methodology

As per the CBI user manual

Principle for calculation of the indicator
(Total area of natural, restored and naturalised areas) ÷ (Total area of city) × 100%

Scoring Range: (based on the CBI user manual)
0 point: <1.0%
1 point: 1.0% - 6.9%
2 points: 7.0% - 13.9%
3 points: 14.0% - 20.0%
4 points: > 20.0%

City Data and Calculations

The definition of natural areas in the Singapore Index manual is difficult to strictly apply within the context of Indian cities where the ground realities are significantly different. Income inequality, a high population density, and limited infrastructural outreach means that while there are native and natural ecosystems, public access to these areas cannot be completely restricted.

To calculate the proportion of natural areas in the city, a natural asset map (Figure 2) of Noida was prepared and referred to. Table 2 shows the various natural classes that have been identified in the natural asset map of Noida that apply to the calculation of this indicator. Anthropogenically influenced land classes such as Urban Forest, Ponds, Tree patches, Open green spaces, Golf Course, Open ground, Paddy cultivation, Mixed cultivation were not considered.

Table 2: Natural assets used in the calculation of indicator 1 (inside Noida boundary)

Sl. No	Land Class	Area in Ha	Area Percentage
1	River	1257.91	5.34
2	Riverine areas	357.57	1.52
3	Natural vegetation (forest)	582.77	2.48
4	Marshes	181.23	0.77
5	Restored forest	3.75	0.02
	Total	**2383.24**	**10.13**

Principal for calculating the indicator: (Total area of natural, restored and naturalized areas) ÷ (Total area of city) × 100%

Total area of natural, restored and naturalized areas: 23.83 sq. km.

Total area of city: 235 sq. km.

RESULT: 10.13%

SCORE: 2

Recommendations to Improve Score

A very small percentage of Noida's total land use is urban green spaces (6.76%) and natural ecosystems (10.13%). The natural ecosystems of the city are highly polluted or compromised by invasive species. Noida Authority should undertake ecological restoration to improve the ecosystem health of the tracts of lands which are remnants of Noida's natural ecosystem such as the Hindon and Yamuna Rivers or identify land under parks and recreational spaces and convert these into biodiversity parks following the Delhi model.

Indicator 2: Connectivity Measures or Ecological Networks to Counter Fragmentation

Methodology

As per the CBI user manual

Principle for calculation of the indicator

$$\frac{1}{A_{total}} * \left(A_1^2 + A_2^2 + A_3^2 + \ldots + A_n^2\right)$$

Where:

- A_{total} is the total area of all natural areas
- A_1 to A_n are areas that are distinct from each other (i.e. more than or equal to 100m apart)
- $_n$ is the total number of connected natural areas

This measures effective mesh size of the natural areas in the city. A_1 to A_n may consist of areas that are the sum of two or more smaller patches which are connected. In general, patches are considered as connected if they are less than 100m apart.

Scoring Range: (based on the CBI user manual)

0 point:	< 200 ha
1 point:	201 - 500 ha
2 points:	501 - 1000 ha
3 points:	1001 - 1500 ha
4 points:	> 1500 ha

City Data and Calculations

The patches associated with the land classes used to calculate indicator 1 i.e., River, Riverine Vegetation, Natural Vegetation, Marshes and Restored Forest have been considered in this calculation. In reality, urban green landscapes represented in Noida by the land classes- open green spaces, urban forests, agricultural landscapes and some natural spaces like tree patches and sparse vegetation also form a part of the ecological network to counter fragmentation for several species. However, these have not been considered following the guidelines of the CBI manual.

104 polygons or patches of selected natural land classes were merged with the land along river (Yamuna) and considered a single unit, as per the 100m proximity rule. Therefore, the total area of this big patch (A_1) was determined as 2063.08 ha (Annexure 3).

There are 28 polygons (patches) outside the 100m buffer of these big patches. As per the 100m proximity rule, these patches are inter-merged into 18 patches (A_2 – A_{19}). The total number of patches is given in Figure 3.

A_{total} = 2383.24 ha

As per the final calculation

Indicator 2 = 1/ 2383.24 ha x (4269642.31 ha^2) = 1791.52 ha

RESULT: 1791.52

SCORE: 4

Recommendations to Maintain Score

Due to the presence of the Yamuna and Hindon Rivers in the west, southwest and east southeast, respectively. Noida scores well in this section. For most part however, Noida has no functional corridors for animal movement. Given that Noida's natural green ecosystems are small patches, the city will need to focus on restoration work to enhance the area of native forests by planting native species, following scientifically sound practices. In areas where Miyawaki plantations are feasible, the city can take this up. Rewilding parks of Noida with natives would also support the development of functional corridors. The Botanical Garden has some patches of scrub and natural forest, this area should be protected and not altered. Encouraging agroforestry practices in the large swathes of agricultural land in Noida's southeast and southwest sides would improve connectivity as well, as would involving RWAs in setting up functional ecological niches and green walls. The Biodiversity Management Committee, once formed, can play a significant role in mobilising RWAs.

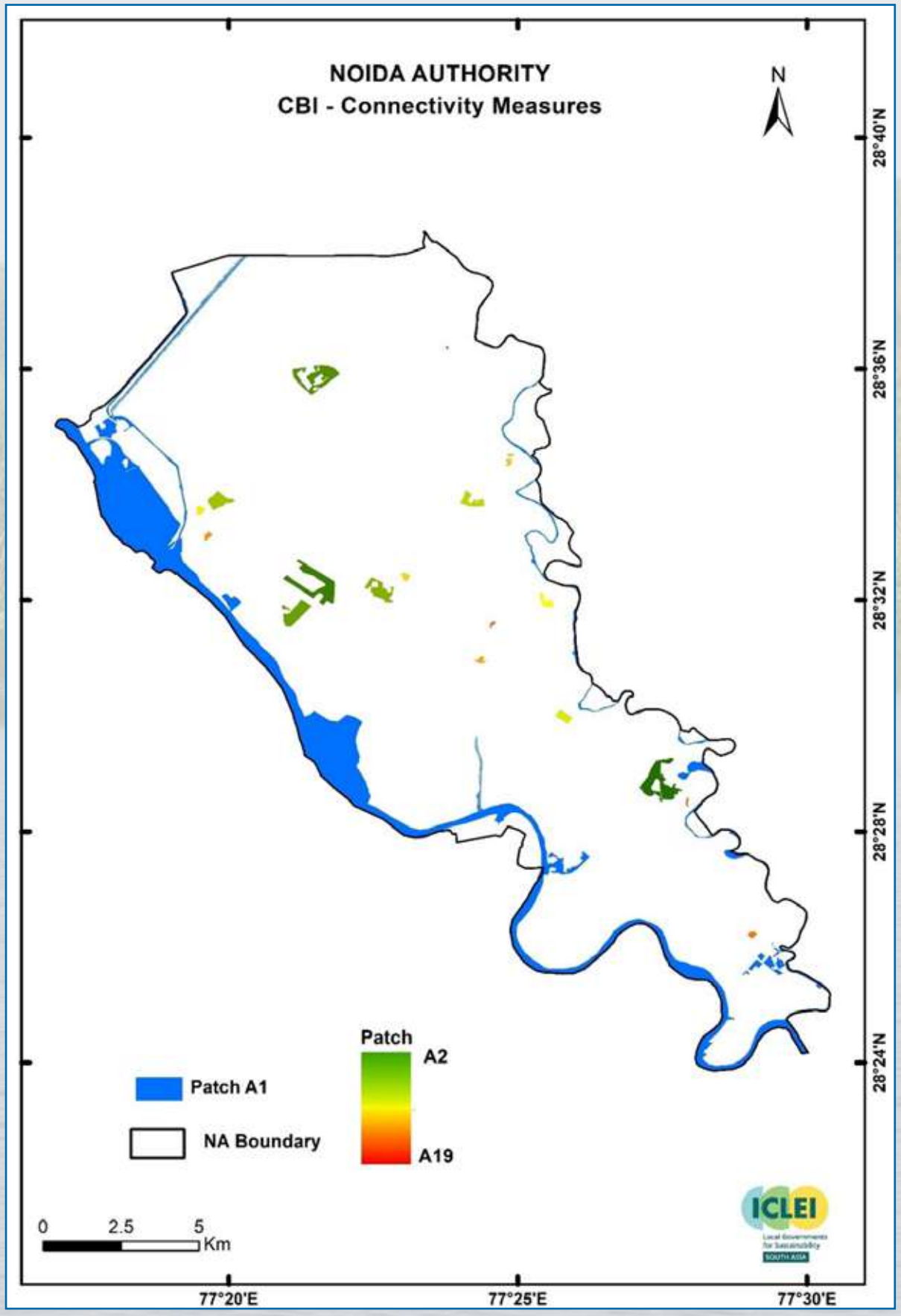

Figure 3: Connectivity map of Noida showing the patches which were merged to calculate Indicator 2

Indicator 3: Native Biodiversity in Built up Areas (Bird Species)

Methodology

How to calculate indicator

Number of native bird species in built up areas where built up areas include impermeable surfaces like buildings, roads, drainage channels, etc., and anthropogenic green spaces like roof gardens, roadside planting, golf courses, private gardens, cemeteries, lawns, urban parks, etc. Areas that are counted as natural areas in indicator 1 should not be included in this indicator.

Scoring Range: (based on the CBI user manual)

0 point: < 19 bird species
1 point: 19 - 27 bird species
2 points: 28 - 46 bird species
3 points: 47 - 68 bird species
4 points: > 68 bird species

City Data and Calculations

Secondary data available on citizen science platforms such as eBird (2023)[iii] developed by Cornell Lab of Ornithology, was referred to for this indicator. The list developed was then vetted by Mr. Abhishek Gulshan, a local naturalist.

Of the 244 bird species that were recorded from within and around the city,151 species are resident species of which 97 occur within anthropogenically altered spaces of the city. The list of the birds considered for calculation of this indicator is provided in Annexure 1, Table 11.

RESULT: 97 bird species

SCORE: 4

Recommendations to Maintain Score

Several of the species recorded for the city are from Okhla Bird Sanctuary. Habitats that support the avian resident population are scrubs, riverbeds and gardens. Given that the borders of Delhi and Greater Noida as so contiguous, several birds may be using Noida for their layovers before moving into these aforementioned areas. Protecting and restoring scrubs and riverine areas would support the bird population in the city. Retrofitting local parks with native vegetation species, spanning multi-layers and water features would also benefit birds and their prey base.

iii. https://ebird.org/india/region/IN-KA-BN?yr=all

Indicators 4 - 8: Change in Number of Native Species

Methodology

How to calculate indicator

The change in number of native species is used for indicators 4 to 8. The three core groups are:

- Indicator 4 : vascular plants
- Indicator 5 : birds
- Indicator 6 : butterflies

These groups have been selected as data are most easily available and to enable some common comparison.

Cities can select any two other taxonomic groups for indicators 7 and 8 (e.g. bryophytes, fungi, amphibians, reptiles, freshwater fish, molluscs, dragonflies, beetles, spiders, hard corals, marine fish, seagrasses, sponges, etc.)

The above data from the first application of the Singapore Index would be recorded in Part I: Profile of the City as the baseline.

Net change in species from the previous survey to the most recent survey is calculated as:

Total increase in number of species (as a result of re-introduction, rediscovery, new species found, etc.) minus number of species that have gone extinct.

Scoring Range: (based on the CBI user manual)

0 point:	Maintaining or a decrease in the number of species
1 point:	1 species increase
2 points:	2 species increase
3 points:	3 species increase
4 points:	4 species or more increase

City Data and Calculations

For the indicators 4-8, information was sourced from scientific publications, government reports, white papers, and citizen science platforms like eBird and iNaturalist. Taxa experts were consulted with at the final stage of the list development.

In the case of indicator 4, the list of plants was compiled from various sources [7], [11], [13] [16] and [12]. Indicator 5 was compiled from eBird and Upadhyay et al. [15] and vetted by Mr. Abhishek Gulshan. Indicator 6 was compiled from Chauhan et al. [17], and iNaturalist.[iv]

For indicators 7 and 8, two additional taxonomic groups of Fish and Mammals, respectively were chosen. Indicator 7 was compiled [14], [19] and [16], while Indicator 8 was compiled from a report developed by Give me Trees and HCL Foundation.

iv. https://www.inaturalist.org/observations?nelat=28.633540879316687&nelng=77.45053674555471&place_id=any&subview=map&swlat=28.489856496397284&swlng=77.31355096674612

These lists will form the baseline for comparison when the index is revisited by the city, after 3-5 years. Annexure 1 provides details of the species lists that have been considered for indicators 4-8.

RESULT: Since this is the baseline year for the species count, the city will not receive any score on the indicators 4-8 and the same will be excluded from the overall calculation.

Indicator 9: Proportion of Protected Natural Areas

Methodology

How to calculate indicator
(Area of protected or secured natural areas) ÷ (Total area of the city) × 100%

Scoring Range: (based on the CBI user manual)
0 point: < 1.4%
1 point: 1.4% - 7.3%
2 points: 7.4% - 11.1%
3 points: 11.2% - 19.4%
4 points: > 19.4%

City Data and Calculations
Protected areas in Noida includes the Okhla Bird Sanctuary, situated at a point where the Yamuna enters the state of Uttar Pradesh, leaving the territory of Delhi. Notified as Sanctuary in the year 1990 it is now one of the 466 Important Bird Areas (IBAs) in India.

Area of protected or secured natural areas = 4 sq. km.

Total area of the city = 235 sq.km

Proportion of Protected Natural Area = 4÷235 × 100%

RESULT: 1.7%

SCORE: 1

Recommendations to Improve Score

Noida needs to first identify areas in the city that are remnants of natural ecosystems such as scrubland, wetlands and riverine areas. Extending the Yamuna Biodiversity Park or even Okhla Bird Sanctuary beyond their present boundaries can be something that can be explored through novel partnerships with the Forest Department and the Delhi Development Authority. These also offer nature-based solutions to flooding which is something the city is extremely prone to. Constituting a Biodiversity Management Committee can anchor these activities at the institutional level. The city can also look into the possibility of declaring some of the restored urban forests as OECMs.

Indicator 10: Proportion of Invasive Alien Species

Methodology

How to calculate indicator
(Number of invasive alien species) ÷ (Number of native species) × 100%

Scoring Range: (based on the CBI user manual)
0 point: > 30.0%
1 point: 20.1% - 30.0%
2 points: 11.1% - 20.0%
3 points: 1.0% - 11.0%
4 points: < 1.0%

City Data and Calculations
In the case of Noida, it was decided to use the vascular plant taxon to carry out the invasive species analysis. The list was compiled and the nativity of each species was assessed using [20] and [21].

A total of 42 invasive species were identified in the city. The total number of native species in the city is 180.

Total Number of Invasive Alien Species = 42

Total Number of Native Species = 180 (Annexure 1, Table 4)

Proportion of Invasive Alien Species = (42÷180) × 100= 23.33%

RESULT: 23%

SCORE: 1

Recommendations to Improve Score

37% of the plant species recorded are introduced of which 39% are invasive alien species. 70% of Okhla Bird Sanctuary, the only protected area of Noida, is infested with monotypic and polytypic colonies of invasive macrophytes [21] needs to assess the risks caused by these species and develop programs that will control the spread. Partnerships with CSR wings of corporates, NGOs, academic institutions and State departments like the Forest Department will be the first step in a multi-pronged approach that tackles the issue. The city also needs to focus on development of distribution maps of the invasive species. Further strategies can be detailed in the LBSAP of the city, once the same is developed.

Indicator 11: Regulation of Quantity of Water

Methodology

How to calculate indicator
(Total permeable area) ÷ (Total terrestrial area of the city) × 100%

Scoring Range: (based on the CBI user manual)
0 point: < 33.1%
1 point: 33.1% - 39.7%
2 points: 39.8% - 64.2%
3 points: 64.3% - 75.0%
4 points: > 75.0%

City Data and Calculations
At the city-level, data on permeable/non-permeable spaces is absent, and hence a permeability map (Figure 4) was prepared by ICLEI South Asia for the purpose of calculating this indicator. Sentinel-2 Level 2 products with a cloud cover of less than 1% comprising of the Noida Authority region was downloaded from Copernicus Open Access Hub of the European Commission. Red (R), Green (G), Blue (B), and Near Infrared (NIR) bands with 10 m spatial resolution and short-wave infrared bands with 20 m spatial resolution were pre-processed for the supervised classification process. The field surveys and Google satellite layer location data for the land use classes of River, Riverine vegetation, Natural vegetation (forest), Marshes, Restored Forest, Sparse vegetation, Urban Forest, Ponds, Tree patches.

Open green spaces, Golf Course, Open ground, Agricultural land, and Urban built-up were utilised as the training data set for the supervised classification based on the standard methodology in ENVI 5.3 software. After the LULC classification, the respective land classes were merged, and a permeability map was prepared.

Total Terrestrial Area of the city = 22218.85 ha (Excluding area of water bodies)

Total Permeable Area (+ area of water bodies) = 22218.85 ha

Regulation of Quantity of Water= (15984.90 /22218.85) *100

RESULT: 71.94%

SCORE: 3

Recommendations to Improve Score

Despite the high score received for this indicator, Noida is still very flood prone as evidenced by the flooding in 2023. The main areas that comprise permeable spaces of the city as detailed in the map, are the riverine ecosystems and agricultural areas. Developing zonation in city plans that retain protective buffers within these areas and no development zones will conserve these spaces. To do this the Authority can look into mapping the watershed which will support a catchment area management plan, feeding into a larger climate resilience plan for the city. Rain water harvesting enforcement in building bye-laws for new constructions as well as residential complexes is a grey infrastructure solution that will complement the other solutions suggested. Focus also needs to be put on maintenance of the existing rain water harvesting systems in some residential complexes. The city has also initiated the development of constructed wetlands in some areas. This should be further upscaled by the Authority.

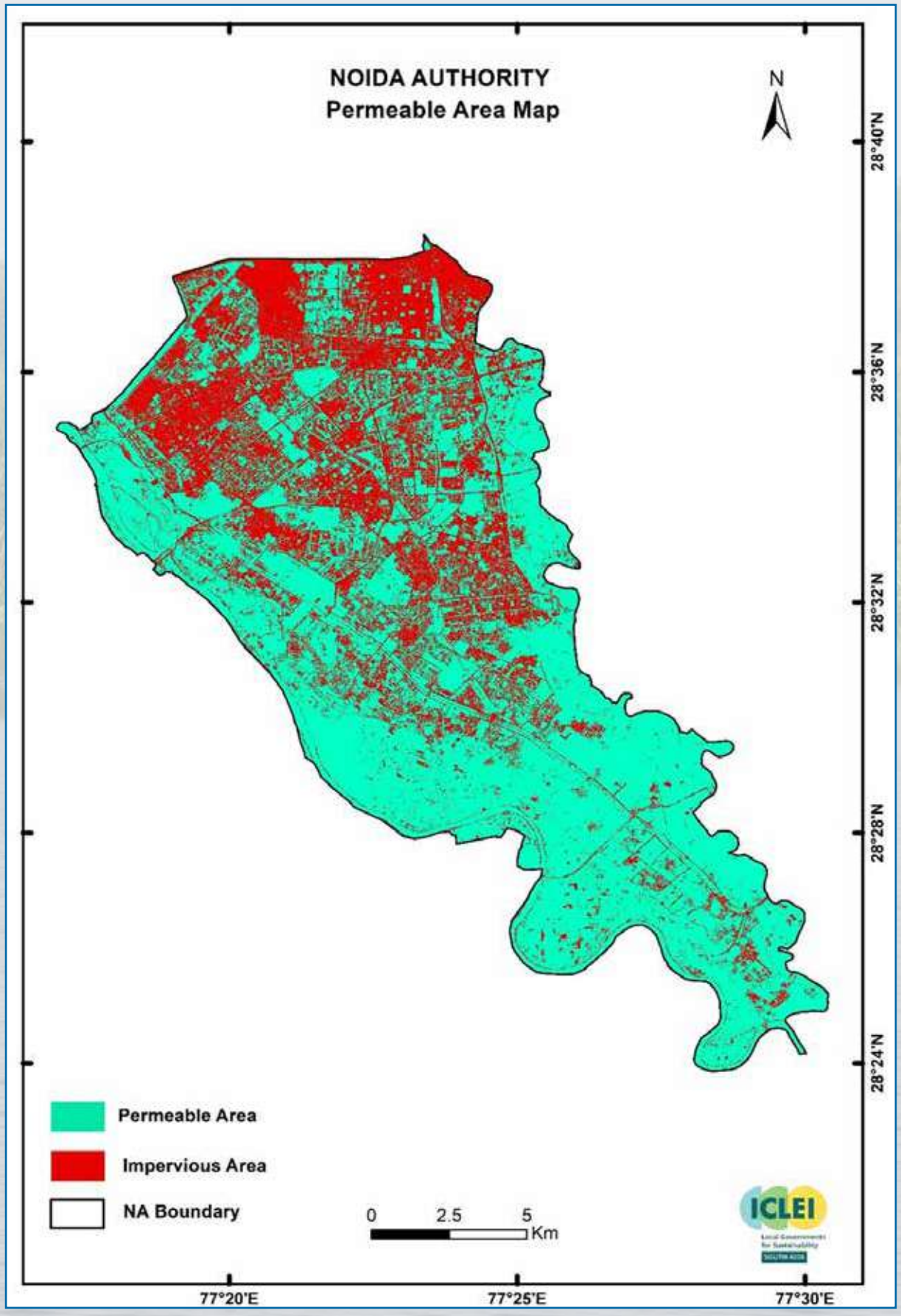

Figure 4: Permeable area of Noida

Indicator 12: Climate Regulation: Carbon Storage and Cooling Effect of Vegetation

Methodology

How to calculate indicator
(Tree canopy cover) ÷ (Total terrestrial area of the city) × 100%

Scoring Range: (based on the CBI user manual)
0 point: < 10.5%
1 point: 10.5% - 19.1%
2 points: 19.2% - 29.0%
3 points: 29.1% - 59.7%
4 points: > 59.7%

City Data and Calculations
In order to calculate indicator 12, a tree cover map (Figure 5) was developed using Sentinel satellite imagery (less than 1% cloud cover) from the Copernicus Open Access Hub of the European Commission. Sentinel bands 2 to 8, 8a, 11, and 12 were pre-processed and used in the supervised classification process based on a standard methodology. The field survey location data for the tree cover classes, such as dense vegetation, avenue tree patches, and plantations, were utilised as the training data set for the tree cover classification in ENVI 5.3 software. The tree cover map was prepared by merging the respective land classes.

Tree cover = (Tree canopy cover) ÷ (Total terrestrial area of the city) × 100%

Tree cover = 2890.97 ha

The total terrestrial area of the city = 22218.85 ha

RESULT: 13.01%

SCORE: 1

Recommendations to Improve Score

Noida - Greater Noida expressway and its service lane bear a large portion of Noida's tree cover. Some of the city's monuments and parks too support a sizeable population of trees. The appropriate maintenance of the present tree stock will support its carbon storage functions. Since a large portion of the east and south-west of the city is agricultural land, encouraging agroforestry practices will have positive impacts on this indicator's score as well as on food systems and local biodiversity. Promotion of development of urban forests in the city will also help to improve the score under this indicator. Tree plantation and maintenance drives should also be promoted by the Authority in the industrial and corporate hubs.

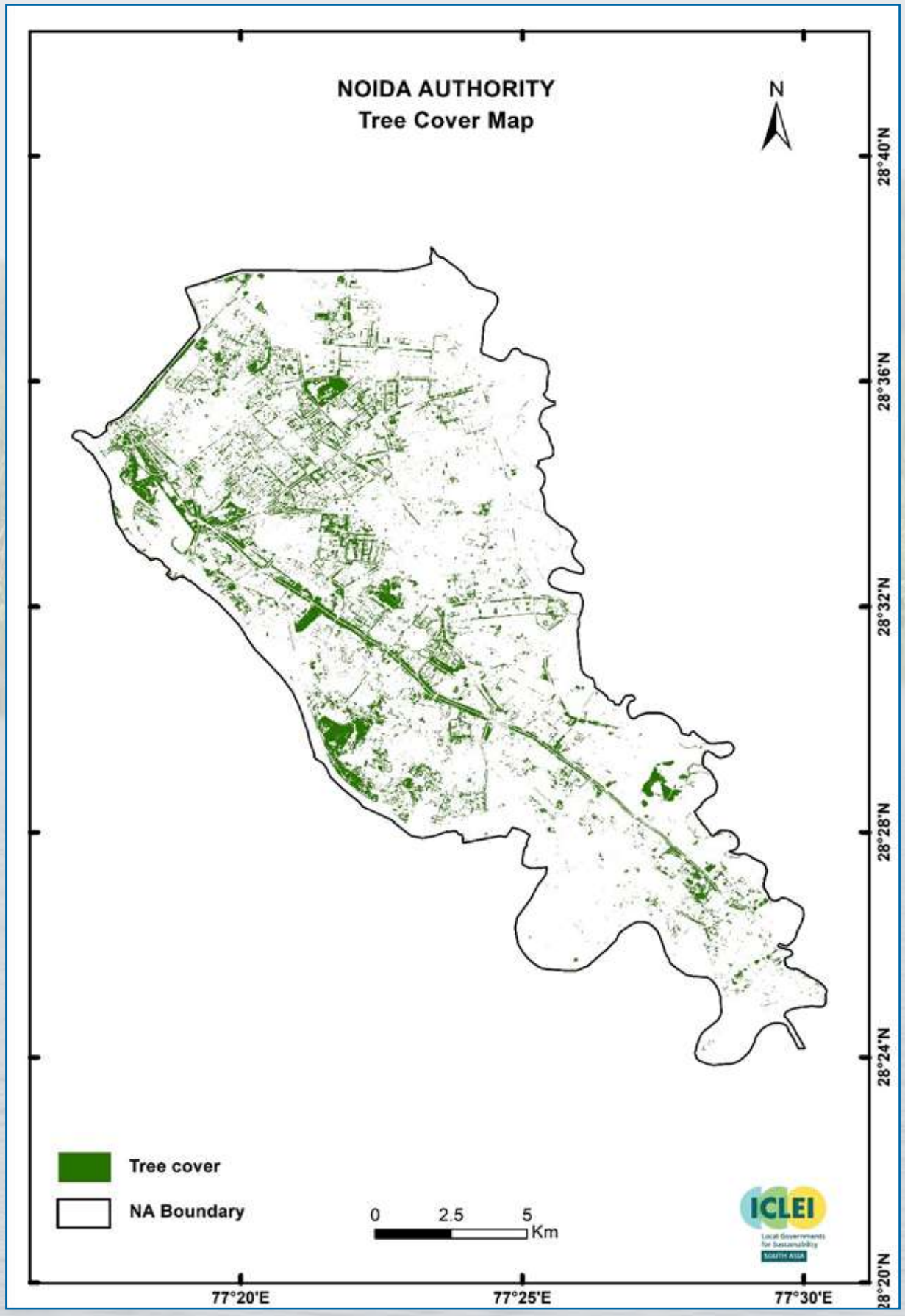

Figure 5: Tree Cover Map of Noida

Indicator 13: Recreational Services

Methodology

How to calculate indicator
(Area of parks with natural areas and protected or secured natural areas)/1000 persons

Scoring Range: (based on the CBI user manual)
0 point: < 0.1 ha/1000 persons
1 point: 0.1 - 0.3 ha/1000 persons
2 points: 0.4 - 0.6 ha/1000 persons
3 points: 0.7 - 0.9 ha/1000 persons
4 points: > 0.9 ha/1000 persons

City Data and Calculations
The main agency that manages and develops parks in the city is the Noida Authority. The Authority manages a total of 268 parks which make up a total of 626.62 ha (Annexure 2).

Additionally, there is also the Okhla Bird Sanctuary, which is accessible to the public, with an area of 4 ha.

(Area of parks with natural areas and protected or secured natural areas)/1000 persons

The total area of parks in the city is = 630.62 ha

Recreational Services = 630.62 /1000

RESULT: 0.63 ha

SCORE: 2

Recommendations to Improve Score

Increasing the number of parks with accompanying plantation in Noida will improve the score for this indicator, as well as the score for Indicator 12. Parks like the Biodiversity Park in sector 91 are dominated by monoculture plantations and have a focus on ornamental species for aesthetic purposes. These parks will host a greater amount of biodiversity if some sections are converted into native multi-species plantations with some water features such as small ponds and scrub areas. Engaging with RWAs will also support better park planning, increase access and participation in recreational spaces in the city.

Indicator 14: Educational Services

Methodology

How to calculate indicator
Average number of formal educational visits per child below 16 years to parks with natural areas or protected or secured natural areas per year

Scoring Range: (based on the CBI user manual)
0 point: 0 formal educational visit/year
1 point: 1 formal educational visit/year
2 points: 2 formal educational visits/year
3 points: 3 formal educational visits/year
4 points: > 3 formal educational visits/year

City Data and Calculations
Discussions with officials of the Noida Authority and other stakeholders yielded the information that park visits are not mandatory for schools as per the set curriculum. However, schools do voluntarily organize these visits, in accordance with their schedule.

Therefore, no formal educational visits per child below 16 years take place to parks with natural areas or protected or secured natural areas per year.

RESULT: No formal educational visit/year

SCORE: 0

Recommendations to Improve Score

Though the city administration does not have any influence on the curriculum of the various boards followed by schools in the city, they can give a directive to all schools to include such visits in their curriculum. A suggestion for the same can also be sent by the city government (through the state government) to all the boards of secondary and senior secondary level education.

Indicator 15: Budget Allocated to Biodiversity

Methodology

How to calculate indicator
(Amount spent on biodiversity related administration) ÷ (Total budget of city) × 100%

Scoring Range: (based on the CBI user manual)
0 point: < 0.4%
1 point: 0.4% - 2.2%
2 points: 2.3% - 2.7%
3 points: 2.8% - 3.7%
4 points: > 3.7%

City Data and Calculations
The following budget allocations in the city budget for the financial year 2023-24 contribute to biodiversity conservation.

Sl. No.	Name of Work	Proposed Budget 2023-24 (In Lakhs)
A	**External Development Work**	
1	Development of park	1500
2	Development of plantation along path	500
3	Development of greenbelts	500
4	Development/establishment of nursery	50
5	Gardening tools/equipment	150
B	**Maintenance Work**	
1	Maintenance of parks	1500
2	Maintenance of trees alongside roads	825
3	Maintenance of greenbelts	825
4	Maintenance of plants in nurseries	75
5	Labour/Outsourcing Payment	250
	Total	**6,175**

Total Budget of Noida Authority= INR 6,92,000 lakhs

Total Budget Allocated for Biodiversity = (6175) ÷ (692000) × 100

RESULT: 0.89%

SCORE: 1

Recommendations to Improve Score

Noida Authority has a lot of scope to increase their score under this indicator by increasing the budget for activities that would benefit biodiversity. One mechanism to do this is through the Local Biodiversity Strategy and Action Plan, which has been developed by ICLEI South Asia, with support from HCL Foundation. The LBSAP will offer opportunities for the Authority to identify areas for action as well as convergent schemes through which funding can be leveraged. Focus on Noida's blue infrastructure in addition to the green will also boost scores elsewhere on the index.

Indicator 16: Number of Biodiversity Projects Implemented by the City Annually

Methodology

How to calculate indicator
Number of programmes and projects that are being implemented by the city authorities, possibly in partnership with private sector, NGOs, etc. per year.

In addition to submitting the total number of projects and programmes carried out, cities are encouraged to provide a listing of the projects and to categorise the list into projects that are:
1. Biodiversity related
2. Ecosystems services related

Scoring Range: (based on the CBI user manual)
0 point: < 12 programmes/projects
1 point: 12 - 21 programmes/projects
2 points: 22 - 39 programmes/projects
3 points: 40 - 71 programmes/projects
4 points: > 71 programmes/projects

City Data and Calculations
Noida city is implementing the following projects and programmes related to biodiversity in the year 2023-24 with support from other government bodies, NGOs and the private sector:

1) Development of parks
2) Development of plantations along avenues
3) Development of greenbelts in partnership with some NGOs
4) Development/establishment of nurseries
5) Development of Noida Biodiversity Park
6) Development of the CBI and LBSAP

RESULT: <12

SCORE: 0

Recommendations to Improve Score

Noida Authority would benefit from improving its scope and number of partnerships with other public agencies and NGOs. This would in turn improve the city's score for this indicator. The BMC, once formed, can spear head these activities and partnerships.

Indicator 17: Policies, Rules and Regulations – Existence of Local Biodiversity Strategy and Action Plan

Methodology

How to calculate indicator

Status of LBSAP (or any equivalent plan); number of associated CBD initiatives.

Scoring Range: (based on the CBI user manual)

0 point: No LBSAP*
1 point: LBSAP not aligned with NBSAP
2 points: LBSAP incorporates elements of NBSAP, but does not include any CBD initiatives**
3 points: LBSAP incorporates elements of NBSAP, and includes one to three CBD initiatives
4 points: LBSAP incorporates elements of NBSAP, and includes four or more CBD initiatives

* LBSAP or equivalent.
** The thematic programmes of work and cross-cutting issues of the CBD are listed in http://www.cbd.int/programmes/. The Strategic Plan for Biodiversity (2011-2020), including the Aichi Biodiversity Targets can also be used as a reference framework (http://www.cbd.int/sp/default.shtml).

City Data and Calculations

The LBSAP of Noida city has been developed by ICLEI South Asia, with support from HCL Foundation.

RESULT: Yes

SCORE: 4

Recommendations to Maintain Score

Noida Authority needs to undertake action points mentioned in LBSAP, through regular allocation of financial resources. In addition, the city will need to revise the LBSAP after five years.

Indicator 18 : Institutional Capacity - Essential Biodiversity Related Functions

Methodology

How to calculate indicator

Number of essential biodiversity related functions* that the city uses.

* The functions could include the following: biodiversity centre, botanical garden, herbarium, zoological garden or museum, insectarium, etc.

Scoring Range: (based on the CBI user manual)

0 point: No functions
1 point: 1 function
2 points: 2 functions
3 points: 3 functions
4 points: > 3 functions

City Data and Calculations

Noida has the following biodiversity functions within its boundaries

1. Botanic Garden of Indian Republic
5. Noida Biodiversity Park

RESULT: 1

SCORE: 1

Recommendations to Improve Score

The present botanical garden is under re-development. More biodiversity functions (like insectarium, orchidarium etc) can be added to it. The Biodiversity Park, presently does not have any such biodiversity functions. The city can look into developing a few such functions in the Biodiversity Park. Partnering with local institutions to develop insectariums, museums and herbaria can help boost the score.

Indicator 19 : Institutional Capacity - Inter-Agency Co-Operation

Methodology

How to calculate indicator

Number of city or local government agencies involved in inter-agency co-operation pertaining to biodiversity matters.

Scoring Range: (based on the CBI user manual)

0 point: 1 or 2 agencies* cooperate on biodiversity matters
1 point: 3 agencies cooperate on biodiversity matters
2 points: 4 agencies cooperate on biodiversity matters
3 points: 5 agencies cooperate on biodiversity matters
4 points: > 5 agencies cooperate on biodiversity matters

* Agencies could include departments or authorities responsible for biodiversity, planning, water, transport, development, finance, infrastructure, etc.

City Data and Calculations

Biodiversity issues are cross-sectorial and, require inter-agency efforts. Noida Authority is the only agency in Noida that is involved in city level biodiversity matters.

RESULT: 1

SCORE: 0

Recommendations to Improve Score

Noida Authority presently is the only agency that plans and executes biodiversity projects. The city can improve their score by constituting a Biodiversity Management Committee who can advise the authority on matters related to biodiversity. Additionally, the city can also set up an autonomous institution functioning as the Research and Development wing that can support holistic planning efforts including biodiversity integration into mainstream plans and development. The city can study this model from Kochi Municipal Corporation, which has established a separate Research and Development Cell to look into issues related to sustainable development, biodiversity and heritage conservation.

Indicator 20 : Participation and Partnership - Formal or Informal Public Consultation

Methodology

How to calculate indicator
Existence and state of formal or informal public consultation process pertaining to biodiversity related matters.

Scoring Range: (based on the CBI user manual)

0 point:	No routine formal or informal process
1 point:	Formal or informal process being considered as part of the routine process
2 points:	Formal or informal process being planned as part of the routine process
3 points:	Formal or informal process in the process of being implemented as part of the routine process
4 points:	Formal or informal process exists as part of the routine process

City Data and Calculations
No formal or informal public consultation process pertaining to biodiversity exists in the city.

RESULT: No formal or informal public consultation

SCORE: 0

Recommendations to Improve Score

Noida has several RWAs that are active in their areas. By consulting and involving them in matters related to park development, plantation, and green belt development, local ownership and pride for natural ecosystems can be increased. Innovative financing and partnerships can result in giving citizens of Noida a greater stake in the management of their green and blue spaces. The traditional knowledge that is residing with the elderly citizens with regard to planning and biodiversity conservation, can also be harped upon by the city, through these consultations.

Indicator 21 : Participation and Partnership - Institutional Partnership

Methodology

How to calculate indicator

Number of agencies/private companies/NGOs/academic institutions/international organisations with which the city is partnering in biodiversity activities, projects and programmes.

Instances of inter-agency co-operation listed in Indicator 19 should not be listed here again.

Scoring Range: (based on the CBI user manual)

0 point:	No formal or informal partnerships
1 point:	City in partnership with 1-6 other national or subnational agencies/private companies/ NGOs/academic institutions/international organisations
2 points:	City in partnership with 7-12 other national or subnational agencies/private companies/ NGOs/academic institutions/international organisations
3 points:	City in partnership with 13-19 other national or subnational agencies/private companies/ NGOs/academic institutions/international organisations
4 points:	City in partnership with 20 or more other national or subnational agencies/private companies/NGOs/academic institutions/international organisations

City Data and Calculations

Noida Authority is partnering with the following agencies on biodiversity-related activities, projects, and programmes.

1) HCL Foundation
2) ICLEI – Local Governments for Sustainability, South Asia
3) HydraGreens
4) Social Action for Forest & Environment
5) Amity University

RESULT: 6

SCORE: 1

Recommendations to Improve Score

Several organisations whether academic, public, private or citizen-led have expressed an interest in supporting the work of the Noida Authority through partnerships designed to have benefits for improving the quality of life in the city. The Authority should proactively explore these types of collaborations to improve the score for this indicator.

Indicator 22 : Education and Awareness: Is Biodiversity or Nature Awareness included in the School Curriculum

Methodology

How to calculate indicator

Is biodiversity or nature awareness included in the school curriculum (e.g. biology, geography, etc.)?

Scoring Range: (based on the CBI user manual)

0 point:	Biodiversity or elements of it are not covered in the school curriculum
1 point:	Biodiversity or elements of it are being considered for inclusion in the school curriculum
2 points:	Biodiversity or elements of it are being planned for inclusion in the school curriculum
3 points:	Biodiversity or elements of it are in the process of being implemented in the school curriculum
4 points:	Biodiversity or elements of it are included in the school curriculum

City Data and Calculations

The schools within the city follow the curriculum of various boards such as the Central Board of Secondary Education (CBSE), Uttar Pradesh State Board of High School and Intermediate Education and Indian Certificate of Secondary Education (ICSE). All these boards have included biodiversity and nature awareness in various subjects like Biology, Geography and Environmental Sciences. Therefore, biodiversity or elements of it are included in the school curriculum.

RESULT: Biodiversity or elements of it are included in the school curriculum

SCORE: 4

Recommendations to Maintain Score

Although the score is high, to make the learning more holistic for the students, the city authority should encourage schools to have regular field visits also incorporated as part of the activities in the curriculum.

Indicator 23: Education and Awareness - Number of Outreach or Public Awareness Events

Methodology

How to calculate indicator
Number of outreach or public awareness events held in the city per year.

Scoring Range: (based on the CBI user manual)
0 point: 0 outreach events/year
1 point: 1 - 59 outreach events/year
2 points: 60 -149 outreach events/year
3 points: 150-300 outreach events/year
4 points: > 300 outreach events/year

City Data and Calculations
The major outreach programmes instituted by Noida Authority include celebrations to mark World Environment Day, World Wetlands Day and events under Swachch Bharat Mission.

RESULT: 1 - 59

SCORE: 1

Recommendations to Improve Score

The city authority should tie-up with local agencies working in the sphere of biodiversity and environmental improvement to undertake regular city-level outreach programmes in the sphere of biodiversity. This will help to improve the score on this indicator.

Table 3: Summary of the Points received for each Indicator

	Maximum Score	Noida's score
Component – Native Biodiversity		
Indicators		
1. Proportion of Natural Areas in the City	4 points	2 points
2. Connectivity Measures	4 points	4 points
3. Native Biodiversity in Built Up Areas (Bird Species)	4 points	4 points
4. Change in Number of Vascular Plant Species	4 points	NA
5. Change in Number of Bird Species	4 points	NA
6. Change in Number of Freshwater fish Species	4 points	NA
7. Change in Number of Species (Odonates)	4 points	NA
8. Change in Number of Species (Amphibians)	4 points	NA
9. Proportion of Protected Natural Areas	4 points	1 point
10. Proportion of Invasive Alien Species	4 points	1 point
Component – Ecosystem Services Provided by Biodiversity		
Indicators		
11. Regulation of Quantity of Water	4 points	3 points
12. Climate Regulation: Carbon Storage and Cooling Effect of Vegetation	4 points	1 point
13. Recreation and Education: Area of Parks with Natural Areas	4 points	2 points
14. Recreation and Education:Number of Formal Education Visits per Child Below 16 Years to Parks with Natural Areas per Year	4 points	0 points
Component – Governance and Management of Biodiversity		
Indicators		
15. Budget Allocated to Biodiversity	4 points	1 point
16. Number of Biodiversity Projects Implemented by the City Annually	4 points	0 points
17. Existence of Local Biodiversity Strategy and Action Plan	4 points	4 points
18. Institutional Capacity: Number of Biodiversity Related Function	4 points	1 point
19. Institutional Capacity: Number of City or Local Government Agencies Involved in Inter-agency Cooperation Pertaining to Biodiversity Matters	4 points	0 points
20. Participation and Partnership: Existence of Formal or Informal Public Consultation Process	4 points	0 points
21. Participation and Partnership: Number of Agencies/Private Companies/NGOs/ Academic Institutions/International Organisations with which the City is Partnering in Biodiversity Activities, Projects and Programmes	4 points	1 point
22. Education and Awareness: Is Biodiversity or Nature Awareness Included in the School Curriculum	4 points	4 points
23. Education and Awareness: Number of Outreach or Public Awareness Events Held in the City per Year	4 points	1 point
Component – Native Biodiversity in the City (Sub-total for indicators 1-10)*		**12 / 20 points***
Component – Ecosystem Services provided by Biodiversity (Sub-total for indicators 11-14)		**6 / 16 points**
Component – Governance and Management of Biodiversity (Sub-total for indicators 15-23)		**12 / 36 points**
Total		**30 / 72 points**

*First application and hence indicators 4-8 are not considered and do not contribute to overall score

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Annexure 1 – List of Species

Table 4: List of Plants

Sl. No.	Family	Scientific Name	Habit	Nativity
1.	*Acanthaceae*	*Blepharis maderaspatensis*	Herb	Native
2.	*Acanthaceae*	*Dicliptera paniculata*	Herb	Native
3.	*Acanthaceae*	*Peristrophe paniculata*	Herb	Native
4.	*Acanthaceae*	*Rungia pectinata*	Herb	Native
5.	*Amaranthaceae*	*Achyranthes aspera*	Herb	Native
6.	*Amaranthaceae*	*Alternanthera paronychioides*	Herb	Invasive alien
7.	*Amaranthaceae*	*Alternanthera pungens*	Herb	Invasive alien
8.	*Amaranthaceae*	*Alternanthera sessilis*	Herb	Invasive alien
9.	*Amaranthaceae*	*Amaranthus tricolor*	Herb	Native
10.	*Amaranthaceae*	*Amaranthus viridis*	Herb	Introduced
11.	*Amaranthaceae*	*Chenopodium album*	Herb	Invasive alien
12.	*Amaranthaceae*	*Dysphania ambrosioides*	Herb	Introduced
13.	*Amaranthaceae*	*Chenopodium murale*	Herb	Invasive alien
14.	*Amaranthaceae*	*Gomphrena celosioides*	Herb	Invasive alien
15.	*Amaranthaceae*	*Pupalia lappacea*	Herb	Native
16.	*Amaranthaceae*	*Suaeda maritima*	Herb	Native
17.	*Amaranthaceae*	*Chenopodium album*	Herb	Native
18.	*Amaranthaceae*	*Alternanthera philoxeroides*	Herb	Invasive alien
19.	*Anacardiaceae*	*Spondias pinnata*	Tree	Native
20.	*Anacardiaceae*	*Mangifera indica*	Tree	Introduced
21.	*Anacardiaceae*	*Lannea coromandelica*	Tree	Native
22.	*Annonaceae*	*Annona squamosa*	Tree	Introduced
23.	*Annonaceae*	*Polyalthia longifolia*	Tree	Native
24.	*Apiaceae*	*Centella asiatica*	Herb	Native
25.	*Apiaceae*	*Hydrocotyle sibthorpioides*	Herb	Native
26.	*Apiaceae*	*Oenanthe javanica*	Herb	Native
27.	*Apiaceae*	*Oenanthe javanica*	Herb	Introduced
28.	*Apocynaceae*	*Alstonia scholaris*	Tree	Native
29.	*Apocynaceae*	*Calotropis gigantea*	Tree	Invasive alien
30.	*Apocynaceae*	*Cascabela thevetia*	Shrub	Introduced
31.	*Apocynaceae*	*Dregea volubilis*	Herb	Native
32.	*Apocynaceae*	*Oxystelma secamone*	Climber	Introduced
33.	*Apocynaceae*	*Pergularia daemia*	Climber	Native

Sl. No.	Family	Scientific Name	Habit	Nativity
34.	*Apocynaceae*	*Tabernaemontana divaricata*	Climber	Native
35.	*Apocynaceae*	*Thevetia peruviana*	Tree	Introduced
36.	*Araceae*	*Lemna perpusilla*	Herb	Introduced
37.	*Araceae*	*Spirodela polyrrhiza*	Herb	Native
38.	*Araceae*	*Pistia stratiotes*	Herb	Invasive alien
39.	*Arecaceae*	*Phoenix sylvestris*	Tree	Native
40.	*Aristolochiaceae*	*Aristolochia indica*	Tree	Native
41.	*Asparagaceae*	*Asparagus racemosus*	Shrub	Native
42.	*Asteraceae*	*Ageratum conyzoides*	Herb	Invasive alien
43.	*Asteraceae*	*Cirsium arvense*	Herb	Native
44.	*Asteraceae*	*Conyza canadensis*	Herb	Introduced
45.	*Asteraceae*	*Cotula hemisphaerica*	Herb	Native
46.	*Asteraceae*	*Eclipta prostrata*	Herb	Invasive alien
47.	*Asteraceae*	*Enydra fluctuans*	Herb	Introduced
48.	*Asteraceae*	*Gnaphalium pensylvanicum*	Herb	Introduced
49.	*Asteraceae*	*Laggera aurita*	Herb	Native
50.	*Asteraceae*	*Launaea nudicaulis*	Herb	Native
51.	*Asteraceae*	*Pulicaria crispa*	Herb	Native
52.	*Asteraceae*	*Soliva anthemifolia*	Herb	Introduced
53.	*Asteraceae*	*Sonchus arvensis*	Herb	Introduced
54.	*Asteraceae*	*Tridax procumbens*	Herb	Invasive alien
55.	*Asteraceae*	*Vernonia cinerea*	Herb	Native
56.	*Asteraceae*	*Xanthium strumarium*	Herb	Invasive alien
57.	*Asteraceae*	*Youngia japonica*	Herb	Native
58.	*Asteraceae*	*Gnaphalium purpureum*	Herb	Invasive alien
59.	*Asteraceae*	*Launea nudicaulis*	Herb	Native
60.	*Asteraceae*	*Parthenium hysterophorus*	Herb	Invasive alien
61.	*Basellaceae*	*Basella rubra*	Climber	Native
62.	*Bignoniaceae*	*Kigelia africana*	Tree	Introduced
63.	*Bignoniaceae*	*Tecomella undulata*	Shrub	Native
64.	*Bignoniaceae*	*Tabebuia aurea*	Tree	Introduced
65.	*Bignoniaceae*	*Kigelia pinnata*	Tree	Introduced
66.	*Bignoniaceae*	*Tecoma stans*	Tree	Introduced
67.	*Bignoniaceae*	*Fernandoa adenophyllum*	Tree	Native
68.	*Bignoniaceae*	*Stereospermum chelonoides*	Tree	Native
69.	*Bignoniaceae*	*Spathodea campanulata*	Tree	Introduced
70.	*Boraginaceae*	*Cordia dichotoma*	Tree	Native
71.	*Boraginaceae*	*Ehretia laevis*	Tree	Native
72.	*Brassicaceae*	*Coronopus didymus*	Herb	Introduced
73.	*Brassicaceae*	*Rorippa nasturtium-aquaticum*	Herb	Introduced

Sl. No.	Family	Scientific Name	Habit	Nativity
74.	*Caesalpiniaceae*	*Hardwickia binata*	Tree	Native
75.	*Cannabinaceae*	*Cannabis sativa*	Herb	Introduced
76.	*Cleomaceae*	*Cleome viscosa*	Herb	Invasive alien
77.	*Combertaceae*	*Terminalia arjuna*	Tree	Native
78.	*Combertaceae*	*Terminalia bellerica*	Tree	Native
79.	*Combretaceae*	*Anogeissus latifolia*	Tree	Native
80.	*Commelinaceae*	*Commelina benghalensis*	Herb	Native
81.	*Commelinaceae*	*Commelina forskalaei*	Herb	Native
82.	*Commelinaceae*	*Commelina undulata*	Herb	Native
83.	*Commelinaceae*	*Commelina kurzii*	Herb	Native
84.	*Convolvulaceae*	*Cuscuta reflexa*	Herb	Invasive alien
85.	*Convolvulaceae*	*Ipomoea aquatica*	Herb	Native
86.	*Convolvulaceae*	*Ipomoea arachnosperma*	Climber	Native
87.	*Convolvulaceae*	*Ipomoea cairica*	Climber	Native
88.	*Convolvulaceae*	*Ipomoea fistulosa*	Shrub	Introduced
89.	*Convolvulaceae*	*Ipomoea indica*	Herb	Introduced
90.	*Convolvulaceae*	*Ipomoea sindica*	Climber	Native
91.	*Convolvulaceae*	*Merremia aegyptia*	Herb	Introduced
92.	*Convolvulaceae*	*Ipomoea aquatica*	Herb	Native
93.	*Convolvulaceae*	*Ipomoea carnea*	Shrub	Invasive alien
94.	*Cucurbitaceae*	*Mukia maderaspatana*	Climber	Native
95.	*Cucurbitaceae*	*Trichosanthes cucumerina*	Climber	Native
96.	*Cyperaceae*	*Carex alopecuroides*	Sedge	Native (to Himalayas)
97.	*Cyperaceae*	*Cyperus bulbosus*	Sedge	Native
98.	*Cyperaceae*	*Cyperus compressus*	Sedge	Native
99.	*Cyperaceae*	*Cyperus iria*	Sedge	Invasive alien
100.	*Cyperaceae*	*Cyperus kyllingia*	Sedge	Native
101.	*Cyperaceae*	*Cyperus nutans*	Sedge	Native
102.	*Cyperaceae*	*Cyperusd dubius*	Sedge	Native
103.	*Cyperaceae*	*Eleocharis palustris*	Sedge	Introduced
104.	*Cyperaceae*	*Fimbristylis cymosa*	Sedge	Native
105.	*Cyperaceae*	*Fimbristylis dichotoma*	Sedge	Native
106.	*Cyperaceae*	*Fimbristylis ferruginea*	Sedge	Native
107.	*Cyperaceae*	*Fimbristylis quinquangularis*	Sedge	Native
108.	*Cyperaceae*	*Rhynchospora colorata*	Sedge	Introduced
109.	*Cyperaceae*	*Schoenoplectiella roylei*	Sedge	Native
110.	*Cyperaceae*	*Scirpus littoralis*	Sedge	Introduced
111.	*Euphorbiaceae*	*Acalypha indica*	Herb	Native
112.	*Euphorbiaceae*	*Croton bonplandianus*	Herb	Invasive alien
113.	*Euphorbiaceae*	*Euphorbia heterophylla*	Herb	Invasive alien

Sl. No.	Family	Scientific Name	Habit	Nativity
114.	*Euphorbiaceae*	*Euphorbia granulata*	Herb	Native
115.	*Euphorbiaceae*	*Euphorbia hirta*	Herb	Invasive alien
116.	*Euphorbiaceae*	*Kirganelia reticulata*	Shrub	Native
117.	*Euphorbiaceae*	*Ricinus communis*	Herb	Invasive alien
118.	*Euphorbiaceae*	*Jatropha curcas*	Shrub	Introduced
119.	*Euphorbiaceae*	*Jatropha integerrima*	Tree	Introduced
120.	*Fabaceae*	*Acacia nilotica*	Herb	Native
121.	*Fabaceae*	*Albizia lebbeck*	Herb	Native
122.	*Fabaceae*	*Alhagi pseudalhagi*	Tree	Introduced
123.	*Fabaceae*	*Alysicarpus vaginalis*	Herb	Native
124.	*Fabaceae*	*Bauhinia purpurea*	Tree	Native
125.	*Fabaceae*	*Cassia tora*	Herb	Native
126.	*Fabaceae*	*Cassia occidentalis*	Herb	Native
127.	*Fabaceae*	*Dalbergia sissoo*	Herb	Native
128.	*Fabaceae*	*Delonix regia*	Herb	Introduced
129.	*Fabaceae*	*Desmodium triflorum*	Tree	Native
130.	*Fabaceae*	*Enterolobium barinense*	Tree	Invasive alien
131.	*Fabaceae*	*Erythrina variegata*	Climber	Native
132.	*Fabaceae*	*Indigofera hochstetteri*	Herb	Native
133.	*Fabaceae*	*Indigofera linnaei*	Herb	Invasive alien
134.	*Fabaceae*	*Leucaena leucocephala*	Herb	Invasive alien
135.	*Fabaceae*	*Melilotus alba*	Tree	Invasive alien
136.	*Fabaceae*	*Melilotus indica*	Herb	Native
137.	*Fabaceae*	*Parkinsonia aculeata*	Herb	Introduced
138.	*Fabaceae*	*Pithecellobium dulce*	Tree	Introduced
139.	*Fabaceae*	*Pongamia pinnata*	Tree	Native
140.	*Fabaceae*	*Prosopis cineraria*	Tree	Native
141.	*Fabaceae*	*Prosopis juliflora*	Tree	Invasive alien
142.	*Fabaceae*	*Rhynchosia minima*	Tree	Native
143.	*Fabaceae*	*Tamarindus indica*	Tree	Introduced
144.	*Fabaceae*	*Tephrosia pumila*	Tree	Native
145.	*Fabaceae*	*Tephrosia purpurea*	Tree	Native
146.	*Fabaceae*	*Tephrosia villosa*	Tree	Native
147.	*Fabaceae*	*Abrus precatorius*	Climber	Native
148.	*Fabaceae*	*Acacia catechu*	Tree	Native
149.	*Fabaceae*	*Cassia fistula*	Tree	Native
150.	*Fabaceae*	*Clitoria terneta*	Herb	Native
151.	*Fabaceae*	*Dalbergia latifolia*	Tree	Native
152.	*Fabaceae*	*Desmodium gangeticum*	Climber	Native
153.	*Fabaceae*	*Desmodium oojeinesis*	Tree	Native

Sl. No.	Family	Scientific Name	Habit	Nativity
154.	*Fabaceae*	*Guilandina bonduc*	Shrub	Native
155.	*Fabaceae*	*Milletia pinnta*	Tree	Native
156.	*Fabaceae*	*Albizia procera*	Tree	Native
157.	*Fabaceae*	*Butea monosperma*	Tree	Native
158.	*Fabaceae*	*Calliandra haematocephala*	Tree	Introduced
159.	*Fabaceae*	*Cassia siamea*	Tree	Introduced
160.	*Fabaceae*	*Pongamia glabra*	Tree	Native
161.	*Fabaceae*	*Senegalia rugata*	Tree	Native
162.	*Fabaceae*	*Pterocarpus marsupium*	Tree	Native
163.	*Fabaceae*	*Bauhinia forficata*	Tree	Introduced
164.	*Lamaceae*	*Ocimum gratissimum*	Herb	Native
165.	*Lamaceae*	*Ocimum tenuiflorum*	Herb	Native
166.	*Lamiaceae*	*Mentha spicata*	Herb	Introduced
167.	*Lamiaceae*	*Gmelina arborea*	Tree	Native
168.	*Loganiaceae*	*Strychnos nux-vomica*	Tree	Native
169.	*Lythraceae*	*Lagerstroemia parviflora*	Tree	Introduced
170.	*Lythraceae*	*Lagerstroemia speciosa*	Tree	Introduced
171.	*Lythraceae*	*Punica granatum*	Tree	Introduced
172.	*Malvaceae*	*Abutilon indicum*	Shrub	Native
173.	*Malvaceae*	*Bombax ceiba*	Tree	Native
174.	*Malvaceae*	*Hibiscus micranthus*	Herb	Native
175.	*Malvaceae*	*Malva parviflora*	Herb	Introduced
176.	*Malvaceae*	*Malvastrum coromandelianum*	Herb	Invasive alien
177.	*Malvaceae*	*Sida acuta*	Herb	Invasive alien
178.	*Malvaceae*	*Sida cordifolia*	Herb	Native
179.	*Malvaceae*	*Sida rhombifolia*	Herb	Native
180.	*Malvaceae*	*Urena lobata*	Herb	Invasive alien
181.	*Malvaceae*	*Ceiba pentandra*	Tree	Introduced
182.	*Malvaceae*	*Guazuma ulmifolia*	Tree	Introduced
183.	*Malvaceae*	*Helicteres isora*	Tree	Native
184.	*Malvaceae*	*Sterculia urens*	Tree	Native
185.	*Malvaceae*	*Pterospermum acerifolium*	Tree	Native
186.	*Malvaceae*	*Grewia tiliifolia*	Tree	Native
187.	*Malvaceae*	*Hildegardia populifolia*	Tree	Native
188.	*Meliaceae*	*Azadirachta indica*	Tree	Introduced
189.	*Meliaceae*	*Melia azedarach*	Tree	Introduced
190.	*Menispermaceae*	*Tinospora sinensis*	Climber	Native
191.	*Moraceae*	*Ficus benghalensis*	Tree	Native
192.	*Moraceae*	*Ficus benjamina*	Tree	Native
193.	*Moraceae*	*Ficus palmata*	Shrub	Native

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

Sl. No.	Family	Scientific Name	Habit	Nativity
234.	*Poaceae*	*Dicanthium annulatum*	Herb	Native
235.	*Poaceae*	*Elescine indica*	Herb	Native
236.	*Poaceae*	*Saccharum spontaneum*	Grass	Invasive alien
237.	*Polygonaceae*	*Persicaria barbata*	Herb	Native
238.	*Polygonaceae*	*Polygonum glabrum*	Herb	Introduced
239.	*Polygonaceae*	*Polygonum hydropiper*	Herb	Native
240.	*Polygonaceae*	*Polygonum lapathifolia*	Herb	Native
241.	*Polygonaceae*	*Polygonum plebeium*	Herb	Native
242.	*Polygonaceae*	*Rumex dentatus*	Herb	Native
243.	*Pontederiaceae*	*Eichhornia crassipes*	Herb	Invasive alien
244.	*Portulacaceae*	*Portulaca oleracea*	Herb	Invasive alien
245.	*Primulaceae*	*Anagallis arvensis*	Herb	Invasive alien
246.	*Primulaceae*	*Anagalis arvensis*	Herb	Native
247.	*Proteaceae*	*Grevillea robusta*	Tree	Introduced
248.	*Putranjivaceae*	*Putranjiva roxburghii*	Tree	Native
249.	*Ranunculaceae*	*Ranunculus sceleratus*	Herb	Native
250.	*Rhamnaceae*	*Zizyphus mauritiana*	Tree	Native
251.	*Rhamnaceae*	*Zizyphus nummularia*	Shrub	Native
252.	*Rhamnaceae*	*Ziziphus mauritiana*	Tree	Native
253.	*Rhamnaceae*	*Ziziphus nummularia*	Shrub	Native
254.	*Rubiaceae*	*Oldenlandia corymbosa*	Herb	Native
255.	*Rubiaceae*	*Mitragyna parviflora*	Tree	Native
256.	*Rubiaceae*	*Neolamarckia cadamba*	Tree	Native
257.	*Rubiaceae*	*Guettarda speciosa*	Shrub	Native
258.	*Rutaceae*	*Glycosmis pentaphylla*	Climber	Native
259.	*Rutaceae*	*Aegle marmelos*	Tree	Native
260.	*Rutaceae*	*Murraya paniculata*	Tree	Native
261.	*Salvadoraceae*	*Salvadora oleoides*	Shrub	Native
262.	*Salviniaceae*	*Azolla pinnata*	Fern	Native
263.	*Salviniaceae*	*Salvinia auriculata*	Fern	Introduced
264.	*Sapindaceae*	*Dodonea viscosa*	Shrub	Introduced
265.	*Sapindaceae*	*Schleichera oleosa*	Tree	Native
266.	*Sapotaceae*	*Mimusops elengi*	Tree	Native
267.	*Sapotaceae*	*Madhuca neriifolia*	Tree	Native
268.	*Sapotaceae*	*Madhuca longifolia*	Tree	Native
269.	*Sapotaceae*	*Manilkara hexandra*	Tree	Native
270.	*Scrophulariaceae*	*Kickxia ramosissima*	Herb	Native
271.	*Scrophulariaceae*	*Mazus pumilus*	Herb	Native
272.	*Simaroubaceae*	*Ailanthus excelsa*	Tree	Native
273.	*Solanaceae*	*Datura metel*	Herb	Introduced

Sl. No.	Family	Scientific Name	Habit	Nativity
274.	*Solanaceae*	*Nicotiana plumbaginifolia*	Herb	Invasive alien
275.	*Solanaceae*	*Solanum nigrum*	Herb	Native
276.	*Solanaceae*	*Solanum surattense*	Herb	Native
277.	*Solanaceae*	*Withania somnifera*	Herb	Native
278.	*Tamaricaceae*	*Tamarix dioica*	Shrub	Native
279.	*Typhaceae*	*Typha angustifolia*	Herb	Native
280.	*Typhaceae*	*Typha elephantina*	Herb	Native
281.	*Typhaceae*	*Typha angustata*	Herb	Invasive alien
282.	*Ulmaceae*	*Holoptelea integrifolia*	Tree	Native
283.	*Verbenaceae*	*Phyla nodiflora*	Herb	Native
284.	*Verbenaceae*	*Clerodendrum indicum*	Shrub	Native
285.	*Verbenaceae*	*Duranta repens*	Shrub	Introduced
286.	*Verbenaceae*	*Tectona grandis*	Tree	Native
287.	*Verbenaceae*	*Lantana camara*	Shrub	Invasive alien

Table 5: List of Fish

Sl. No.	Name of species	Family
1.	*Acanthocobitis botia*	Nemacheilidae
2.	*Ailia coila*	Ailiidae
3.	*Amblypharyngodon mola*	Cyprinidae
4.	*Anabas testudineus*	Anabantidae
5.	*Aspidoparia jaya*	Cyprinidae
6.	*Bagarius bagarius*	Sisoridae
7.	*Bangana dero*	Cyprinidae
8.	*Barilius barila*	Cyprinidae
9.	*Botia lohachata*	Botiidae
10.	*Cabdio morar*	Cyprinidae
11.	*Catla catla*	Cyprinidae
12.	*Chagunius chagunio*	Cyprinidae
13.	*Chanda nama*	Ambassidae
14.	*Channa marulius*	Channidae
15.	*Channa punctata*	Channidae
16.	*Channa striata*	Channidae
17.	*Chitala chitala*	Notopteridae
18.	*Cirrhinus mrigala*	Cyprinidae
19.	*Cirrhinus reba*	Cyprinidae
20.	*Clarias batrachus*	Clariidae
21.	*Clarias gariepinus*	Heteropneustidae
22.	*Clupisoma garua*	Schilbeidae
23.	*Crossocheilus latius*	Cyprinidae

Sl. No.	Name of species	Family
24.	*Ctenopharyngodon idella*	Cyprinidae
25.	*Cyprinus carpio*	Cyprinidae
26.	*Esomus danricus*	Cyprinidae
27.	*Eutropiichthys murius*	Schilbeidae
28.	*Eutropiichthys vacha*	Schilbeidae
29.	*Gagata cenia*	Sisoridae
30.	*Glossogobius giuris*	Tetraodontidae
31.	*Gogangra viridescens*	Sisoridae
32.	*Gonialosa manmina*	Engraulidae
33.	*Gudusia chapra*	Clupeidae
34.	*Heteropneustes fossilis*	Schilbeidae
35.	*Hypophthalmichthys molitrix*	Cyprinidae
36.	*Hypophthalmichthys snobilis*	Cyprinidae
37.	*Johnius coitor*	Nandidae
38.	*Labeo angra*	Cyprinidae
39.	*Labeo bata*	Cyprinidae
40.	*Labeo calbasu*	Cyprinidae
41.	*Labeo dyocheilus*	Cyprinidae
42.	*Labeo gonius*	Cyprinidae
43.	*Labeo pangusia*	Cyprinidae
44.	*Labeo rohita*	Cyprinidae
45.	*Leiodon cutcutia*	Mastacembelidae
46.	*Macrognathus aral*	Mastacembelidae
47.	*Mastacembelus armatus*	Mastacembelidae
48.	*Mastacembelus pancalus*	Mastacembelidae
49.	*Mystus bleekeri*	Bagridae
50.	*Mystus cavasius*	Bagridae
51.	*Mystus tengara*	Bagridae
52.	*Mystus vittatus*	Bagridae
53.	*Nandus nandus*	Nandidae
54.	*Neotropius atherinoides*	Schilbeidae
55.	*Notopterus notopterus*	Notopteridae
56.	*Ompok bimaculatus*	Siluridae
57.	*Ompok pabda*	Siluridae
58.	*Oreochromis niloticus*	Anabantidae
59.	*Osteobrama cotio cotio*	Cyprinidae
60.	*Oxygaster bacaila*	Cyprinidae
61.	*Pangasius pangasius*	Pangasiidae
62.	*Parambassis ranga*	Ambassidae
63.	*Pethia conchonius*	Cyprinidae
64.	*Pethia ticto*	Cyprinidae
65.	*Puntius sophore*	Cyprinidae
66.	*Raiamas bola*	Cyprinidae

Sl. No.	Name of species	Family
67.	*Rasbora daniconius*	Cyprinidae
68.	*Rhinomugil corsula*	Mugilidae
69.	*Rita rita*	Claridae
70.	*Salmophasia bacaila*	Cyprinidae
71.	*Securicula gora*	Cobitidae
72.	*Setipinna phasa*	Cyprinidae
73.	*Sicamugil cascasia*	Belonidae
74.	*Silonia silondia*	Pangasiidae
75.	*Sperata aor*	Bagridae
76.	*Sperata seenghala*	Bagridae
77.	*Systomus sarana*	Cyprinidae
78.	*Trichogaster fasciata*	Osphronemidae
79.	*Trichogaster lalius*	Channidae
80.	*Wallago attu*	Siluridae
81.	*Xenentodon cancila*	Ambassidae

Table 6: List of Butterflies

Sl. No.	Scientific Name	Common Name
1.	*Acraea terpsicore*	Tawny Coster
2.	*Aglais kaschmirensis*	Indian Tortoiseshell
3.	*Agonopterix argillacea*	Tortricid Moth
4.	*Altha subnotata*	Slug Moth
5.	*Amyna punctum*	Amynna Moth
6.	*Antheraea mylitta*	Tussar Silk Moth
7.	*Argynnis hyperbius*	Indian Fritillary
8.	*Ariadne ariadne*	Angled Castor
9.	*Ariadne merione*	Common Castor
10.	*Azanus ubaldus*	Bright Babul Blue
11.	*Belenois aurota*	Indian Pioneer
12.	*Callopistria maillardi*	Callopistria Moth
13.	*Catochrysops strabo*	Forget Me Not Butterfly
14.	*Catopsilia pomona*	Lemon Emigrant
15.	*Catopsilia pyranthe*	Mottled Emigrant
16.	*Chilades pandava*	Oriental Plains Cupid
17.	*Chrysodeixis acuta*	Tunbridge Wells
18.	*Cnaphalocrocis medinalis*	Rice Leaf
19.	*Colotis amata*	Desert Small Salmon Arab
20.	*Condica illecta*	Groundling Moth
21.	*Creatonotos gangis*	Aarctiine Moth
22.	*Danaus chrysippus*	Plain Tiger Butterfly
23.	*Daphnis nerii*	Oleander Hawk Moth
24.	*Delias eucharis*	Common Jezebel

Sl. No.	Scientific Name	Common Name
25.	*Eretmocera impactella*	Gelechia Moth
26.	*Euchrysops cnejus*	Gram Blue
27.	*Eurema brigitta*	Redline Small Grass Yellow
28.	*Eurema hecabe*	Common Grass Yellow
29.	*Fissicrambus mutabilis*	Veneer Moth
30.	*Graphium doson*	Common Jay
31.	*Graphium policenes*	Common Swordtail
32.	*Hasora chromus*	Common Banded Awl
33.	*Helicoverpa armigera*	Cotton Bollworm Moth
34.	*Hyperythra lutea*	Geometrid Moth
35.	*Hypolimnas bolina*	Oriental Great Eggfly
36.	*Hypolimnas misippus*	Daniad Eggfly
37.	*Ixias pyrene*	Yellow Orange Tip
38.	*Junonia almana*	Peacock Pansy
39.	*Junonia hierta*	Yellow Pansy
40.	*Junonia lemonias*	Lemon Pansy
41.	*Junonia orithya*	Blue Pansy
42.	*Lepisma saccharinum*	Common Silverfish
43.	*Leptotes plinius*	Zebra Blue
44.	*Luthrodes pandava*	Plains Cupid
45.	*Melanitis leda*	Common Evening Brown
46.	*Omiodes accepta*	Sugarcane Leaf Roller
47.	*Ophiusa tirhaca*	Green Drab
48.	*Orphanostigma abruptalis*	
49.	*Pachliopta aristolochiae*	Common Rose
50.	*Papilio demoleus*	Lime Swallowtail
51.	*Papilio polytes*	Common Mormon
52.	*Paraponyx fluctuosalis*	Rice Case Worm
53.	*Pelopidas mathias*	Dakhan Small Branded Swift
54.	*Phalanta phalantha*	Common Leopard Butterfly
55.	*Pieris canidia*	Indian Cabbage White
56.	*Pieris rapae*	Small White
57.	*Pseudozizeeria maha*	Pale Grass Blue
58.	*Scirpophaga incertulas*	Rice Yellow Stem Borer
59.	*Sdanaus genutia*	Striped Tiger
60.	*Spindasis vulcanus*	Common Silverline
61.	*Spoladia recurvalis*	Beet Webworm Moth
62.	*Suastus gremius*	Indian Palm Bob
63.	*Syntomoides imaon*	Handmaiden moth
64.	*Tarucus nara*	Striped Pierrot
65.	*Telicota colon*	Pale Palm Dart
66.	*Tirumala Limniace*	Blue Tiger
67.	*Trigonodes hyppasia*	Triangles or Semi-Looper

Sl. No.	Scientific Name	Common Name
68.	*Utethesia pulchelloides*	Heliotrope Moth
69.	*Vanessa cardui*	Painted Lady
70.	*Westermannia superba*	
71.	*Zizeeria karsandra*	Dark Grass Blue
72.	*Zizula hylax*	Tiny Grass Blue

Table 7: List of Insects

Sl. No.	*Scientific Name*	Common Name
1	*Acherontia styx*	Eastern Death's Head hawk
2	*Apis dorsata*	Giant Honey Bee
3	*Apis florea*	Red Dwarf-Honey Bee
4	*Asian Honey Bee*	Apis cerana
5	*Aulacophora indica*	Cucurbit beetle
6	*Bagrada hilaris*	Bagrada Bug
7	*Bicolored Shield Ant*	Meranoplus bicolor
8	*Camponotus caompressus*	Indian Black Ant
9	*Campsomeriella collaris*	Scoliid wasp
10	*Daphnis nerii*	Oleander Hawkmoth
11	*Dysedercus sp.*	Cotton Stainer Bug
12	*Eristalinus megacephalus*	Big-headed Lagoon Fly
13	*Euborellia annulipes*	Ring-legged Earwig
14	*Gametis versicolor*	Indian Flower Chafer
15	*Hycleus biundulatus*	Blister beetle
16	*Orthetrum pruinosum*	Crimson-tailed Marsh Hawk
17	*Pantala flavescens*	Wandering Glider
18	*Plexippus paykulli*	Pantropical Jumping Spider
19	*Poekilocerus pictus*	Painted Grasshopper
20	*Polistes stigma*	Tropical Paper Wasp
21	*Rhodothemis rufa*	Rufous Marsh Glider

Table 8: List of Mammals

Sl. No.	Local Name	Scientific Name	Family
1	Five-striped palm Squirrel	*Funambulus pennantii*	Sciuridae
2	House Rat	*Rattus rattus*	Muridae
3	House Shrew	*Suncus murinus*	Soricidae
4	Indian Bush Rat	*Golunda ellioti*	Muridae
5	Indian Flying Fox	*Pteropus giganteus*	Pteropodidae
6	Indian Hare	*Lepusni gricollis*	Leporidae
7	Indian Porcupine	*Hystrix indica*	Hystricidae
8	Large Bandicoot Rat	*Bandicota indica*	Muridae
9	Lesser Bandicoot Rat	*Bandicota bengalensis*	Muridae
10	Little Indian Field Mouse	*Mus booduga*	Muridae

Sl. No.	Local Name	Scientific Name	Family
11	Nilgai	*Boselaphustrago camelus*	Bovidae
12	Small Indian Mongoose	*Herpestesja vanicus*	Herpestidae

Table 9: List of Reptiles

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

Table 10: List of Aquatic Flora and Fauna

Sl. No.	Scientific Name	Vernacular Name
Introduced		
Aquatic Plants		
1	*Nelumbo nucifera*	Kamal
2	*Nymphaea caerulea*	Blue Kumud
3	*Nymphaea colorata*	Violet Kumud
4	*Nymphaea mexicana*	Yellow Kumud
5	*Nymphaea pubescens*	White Kumud
6	*Nymphaea rubra*	Red Kumud
7	*Victoria amazonica*	Victoria
Fauna		
1	*Labeo catla*	Catla
2	*Labeo rohita*	Rohu
Naturally Occurring		
Flora: Phytoplankton		
1	*Chlamydomonas reinhardtii*	Chlamydomonas
2	*Chlorella vulgaris*	Chlorella
3	*Closterium ehrenbergii*	Closterium
4	*Eudorina elegans*	Eudorina
5	*Fragilaria sp.*	Fragilaria
6	*Navicula cryptocephala*	Navicula
7	*Pediastrum simplex*	Pediastrum
8	*Phacus longicauda*	Phacus
9	*Scenedesmus quadricauda*	Scenedesmus
10	*Spirogyra sp.*	Spirogyra
11	*Zygnema* sp.	Zygnema

Sl. No.	Scientific Name	Vernacular Name
Macro-algae		
1	*Chara sp.*	Chara
Macrophytes		
1	*Ceratophyllum demersum*	Hornwort
2	*Hydrilla verticillata*	Water thyme
3	*Potamogeton crispus*	Curled pondweed
4	*Potamogeton nodosus*	Long leaf pond weed
5	*Vallisneria spiralis*	Vallisneria
Fauna: Zooplankton		
1	*Chironomids*	Chironomids
2	*Cybister sp. Larvae*	Cybister
3	*Cyclops bicuspidatus*	Cyclops
4	*Cyclops sp.*	Nauplius larva
5	*Daphnia magna*	Daphnia
6	*Gerris sp.*	Pond Skater
7	*Moina macrocopa*	Moina
8	*Ranatra sp.*	Water stick insect
9	*Tubifex tubifex*	Sludge worm

Table 11: List of Birds

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
Waterfowl					
1	Lesser Whistling-Duck	*Dendrocygna javanica*	Anseriformes	Resident	No
2	Bar-headed Goose	*Anser indicus*	Anseriformes	Migrant	
3	Greylag Goose	*Anser anser*	Anseriformes	Migrant	
4	Greater White-fronted Goose	*Anser albifrons*	Anseriformes	Migrant	
5	Knob-billed Duck (Comb Duck)	*Sarkidiornis melanotos*	Anseriformes	Resident	No
6	Ruddy Shelduck (Brahminy Duck)	*Tadorna ferruginea*	Anseriformes	Migrant	
7	Common Shelduck	*Tadorna tadorna*	Anseriformes	Migrant	
8	Cotton Pygmy-Goose (Cotton Teal)	*Nettapus coromandelianus*	Anseriformes	Resident	No
9	Garganey	*Spatula querquedula*	Anseriformes	Migrant	
10	Northern Shoveler	*Spatula clypeata*	Anseriformes	Migrant	
11	Gadwall	*Mareca strepera*	Anseriformes	Migrant	
12	Falcated Duck	*Mareca falcata*	Anseriformes	Migrant	
13	Eurasian Wigeon	*Mareca penelope*	Anseriformes	Migrant	
14	Indian Spot-billed Duck	*Anas poecilorhyncha*	Anseriformes	Resident	No
15	Mallard	*Anas platyrhynchos*	Anseriformes	Migrant	
16	Northern Pintail	*Anas acuta*	Anseriformes	Migrant	
17	Green-winged Teal (Common Teal)	*Anas crecca*	Anseriformes	Migrant	

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
18	Red-crested Pochard	*Netta rufina*	Anseriformes	Migrant	
19	Common Pochard	*Aythya ferina*	Anseriformes	Migrant	
20	Ferruginous Duck (Ferruginous Pochard)	*Aythya nyroca*	Anseriformes	Migrant	
21	Tufted Duck	*Aythya fuligula*	Anseriformes	Migrant	
22	Greater Scaup	*Aythya marila*	Anseriformes	Migrant	
Grouse, Quail, and Allies					
23	Indian Peafowl	*Pavo cristatus*	Phasianidae	Resident	Yes
24	Grey Francolin	*Ortygornis pondicerianus*	Phasianidae	Resident	Yes
25	Black Francolin	*Francolinus francolinus*	Phasianidae	Resident	Yes
26	Common Quail	*Coturnix coturnix*	Phasianidae	Migrant	
27	Rain Quail	*Coturnix coromandelica*	Phasianidae	Resident	No
Flamingos					
28	Greater Flamingo	*Phoenicopterus roseus*	Phoenicopteridae	Migrant	
	Grebes				
29	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	Resident	Yes
30	Great Crested Grebe	*Podiceps cristatus*	Podicipedidae	Migrant	
31	Eared Grebe (Black-necked Grebe)	*Podiceps nigricollis*	Podicipedidae	Migrant	
Pigeons and Doves					
32	Rock Pigeon (Blue Rock Pigeon)	*Columba livia*	Columbidae	Resident	Yes
33	Oriental Turtle-Dove	*Streptopelia orientalis*	Columbidae	Migrant	
34	Eurasian Collared-Dove	*Streptopelia decaocto*	Columbidae	Resident	Yes
35	Red Collared-Dove (Red Turtle-Dove)	*Streptopelia tranquebarica*	Columbidae	Resident	Yes
36	Spotted Dove	*Spilopelia chinensis*	Columbidae	Migrant	
37	Laughing Dove (Little Brown Dove)	*Spilopelia senegalensis*	Columbidae	Resident	Yes
38	Orange-breasted Green-Pigeon	*Treron bicinctus*	Columbidae	Migrant	
39	Yellow-footed Green-Pigeon	*Treron phoenicopterus*	Columbidae	Resident	Yes
Sandgrouse					
40	Chestnut-bellied Sandgrouse	*Pterocles exustus*	Pteroclidae	Resident	No
	Cuckoos				
41	Greater Coucal	*Centropus sinensis*	Cuculidae	Resident	Yes
42	Pied Cuckoo (Jacobin Cuckoo)	*Clamator jacobinus*	Cuculidae	Migrant	
43	Asian Koel	*Eudynamys scolopaceus*	Cuculidae	Resident	Yes
44	Grey-bellied Cuckoo	*Cacomantis passerinus*	Cuculidae	Migrant	
45	Common Hawk-Cuckoo	*Hierococcyx varius*	Cuculidae	Resident	Yes
46	Common Cuckoo	*Cuculus canorus*	Cuculidae	Migrant	
Nightjars					
47	Savanna Nightjar	*Caprimulgus affinis*	Caprimulgidae	Migrant	
Swifts					
48	Alpine Swift	*Apus melba*	Apodidae	Migrant	

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
49	Little Swift (Indian House Swift)	*Apus affinis*	Apodidae	Resident	Yes
50	Asian Palm Swift	*Cypsiurus balasiensis*	Apodidae	Resident	Yes
Rails, Gallinules, and Allies					
51	Eurasian Moorhen	*Gallinula chloropus*	Rallidae	Resident	Yes
52	Eurasian Coot	*Fulica atra*	Rallidae	Resident	Yes
53	Grey-headed Swamphen (Purple Swamphen)	*Porphyrio poliocephalus*	Rallidae	Resident	Yes
54	Watercock	*Gallicrex cinerea*	Rallidae	Migrant	
55	White-breasted Waterhen	*Amaurornis phoenicurus*	Rallidae	Resident	Yes
56	Ruddy-breasted Crake	*Zapornia fusca*	Rallidae	Migrant	
57	Brown Crake	*Zapornia akool*	Rallidae	Resident	No
58	Baillon's Crake	*Zapornia pusilla*	Rallidae	Migrant	
Cranes					
59	Demoiselle Crane	*Anthropoides virgo*	Gruidae	Migrant	
60	Sarus Crane	*Antigone antigone*	Gruidae	Resident	Yes
61	Common Crane	*Grus grus*	Gruidae	Migrant	
Shorebirds					
62	Indian Thick-knee (Indian Stone-curlew)	*Burhinus indicus*	Burhinidae	Resident	Yes
63	Black-winged Stilt	*Himantopus himantopus*	Recurvirostridae	Resident	Yes
64	Pied Avocet	*Recurvirostra avosetta*	Recurvirostridae	Migrant	
65	Black-bellied Plover (Grey Plover)	*Pluvialis squatarola*	Charadriidae	Migrant	
66	Pacific Golden-Plover	*Pluvialis fulva*	Charadriidae	Migrant	
67	Northern Lapwing	*Vanellus vanellus*	Charadriidae	Migrant	
68	River Lapwing	*Vanellus duvaucelii*	Charadriidae	Resident	No
69	Yellow-wattled Lapwing	*Vanellus malabaricus*	Charadriidae	Resident	No
70	Grey-headed Lapwing	*Vanellus cinereus*	Charadriidae	Migrant	
71	Red-wattled Lapwing	*Vanellus indicus*	Charadriidae	Resident	Yes
72	White-tailed Lapwing	*Vanellus leucurus*	Charadriidae	Migrant	
73	Lesser Sand-Plover	*Charadrius mongolus*	Charadriidae	Migrant	
74	Kentish Plover	*Charadrius alexandrinus*	Charadriidae	Migrant	
75	Common Ringed Plover	*Charadrius hiaticula*	Charadriidae	Migrant	
76	Little Ringed Plover	*Charadrius dubius*	Charadriidae	Resident	No
77	Greater Painted-Snipe	*Rostratula benghalensis*	Rostratulidae	Resident	No
78	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	Jacanidae	Resident	No
79	Bronze-winged Jacana	*Metopidius indicus*	Jacanidae	Resident	No
80	Eurasian Curlew	*Numenius arquata*	Scolopacidae	Migrant	
81	Black-tailed Godwit	*Limosa limosa*	Scolopacidae	Migrant	
82	Ruff	*Calidris pugnax*	Scolopacidae	Migrant	
83	Curlew Sandpiper	*Calidris ferruginea*	Scolopacidae	Migrant	
84	Temminck's Stint	*Calidris temminckii*	Scolopacidae	Migrant	
85	Dunlin	*Calidris alpina*	Scolopacidae	Migrant	
86	Little Stint	*Calidris minuta*	Scolopacidae	Migrant	

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

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
Herons, Ibis, and Allies					
124	Great Bittern	*Botaurus stellaris*	Ardeidae	Migrant	
125	Yellow Bittern	*Ixobrychus sinensis*	Ardeidae	Migrant	
126	Little Bittern	*Ixobrychus minutus*	Ardeidae	Migrant	
127	Cinnamon Bittern	*Ixobrychus cinnamomeus*	Ardeidae	Migrant	
128	Black Bittern	*Ixobrychus flavicollis*	Ardeidae	Migrant	
129	Grey Heron	*Ardea cinerea*	Ardeidae	Resident	No
130	Purple Heron	*Ardea purpurea*	Ardeidae	Resident	No
131	Great Egret	*Ardea alba*	Ardeidae	Resident	No
132	Intermediate Egret	*Ardea intermedia*	Ardeidae	Resident	No
133	Little Egret	*Egretta garzetta*	Ardeidae	Resident	Yes
134	Cattle Egret	*Bubulcus ibis*	Ardeidae	Resident	Yes
135	Indian Pond-Heron	*Ardeola grayii*	Ardeidae	Resident	Yes
136	Black-crowned Night-Heron	*Nycticorax nycticorax*	Ardeidae	Resident	Yes
137	Striated Heron (Little Heron)	*Butorides striata*	Ardeidae	Resident	Yes
138	Glossy Ibis	*Plegadis falcinellus*	Threskiornithidae	Resident	No
139	Black-headed Ibis	*Threskiornis melanocephalus*	Threskiornithidae	Resident	Yes
140	Red-naped Ibis (Indian Black Ibis)	*Pseudibis papillosa*	Threskiornithidae	Resident	Yes
141	Eurasian Spoonbill	*Platalea leucorodia*	Threskiornithidae	Migrant	
Vultures, Hawks, and Allies					
142	Osprey	*Pandion haliaetus*	Pandionidae	Migrant	
143	Black-winged Kite (Black-shouldered Kite)	*Elanus caeruleus*	Accipitridae	Resident	Yes
144	Egyptian Vulture	*Neophron percnopterus*	Accipitridae	Resident	No
145	Oriental Honey-buzzard (Crested Honey Buzzard)	*Pernis ptilorhynchus*	Accipitridae	Resident	Yes
146	Red-headed Vulture	*Sarcogyps calvus*	Accipitridae	Migrant	
147	White-backed Vulture	*Gyps africanus*	Accipitridae	Migrant	
148	White-rumped Vulture	*Gyps bengalensis*	Accipitridae	Migrant	
149	Indian Vulture (Indian Long-billed Vulture)	*Gyps indicus*	Accipitridae	Migrant	
150	Himalayan Griffon (Himalayan Vulture)	*Gyps himalayensis*	Accipitridae	Migrant	
151	Eurasian Griffon (Griffon Vulture)	*Gyps fulvus*	Accipitridae	Migrant	
152	Crested Serpent-Eagle	*Spilornis cheela*	Accipitridae	Migrant	
153	Short-toed Snake-Eagle	*Circaetus gallicus*	Accipitridae	Resident	No
154	Indian Spotted Eagle	*Clanga hastata*	Accipitridae	Resident	No
155	Greater Spotted Eagle	*Clanga clanga*	Accipitridae	Migrant	
156	Booted Eagle	*Hieraaetus pennatus*	Accipitridae	Migrant	
157	Steppe Eagle	*Aquila nipalensis*	Accipitridae	Migrant	
158	Imperial Eagle	*Aquila heliaca*	Accipitridae	Migrant	
159	Bonelli's Eagle	*Aquila fasciata*	Accipitridae	Resident	No
160	White-eyed Buzzard	*Butastur teesa*	Accipitridae	Migrant	

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
161	Eurasian Marsh-Harrier	*Circus aeruginosus*	Accipitridae	Migrant	
162	Pallid Harrier	*Circus macrourus*	Accipitridae	Migrant	
163	Shikra	*Accipiter badius*	Accipitridae	Resident	Yes
164	Eurasian Sparrowhawk	*Accipiter nisus*	Accipitridae	Migrant	
165	Black Kite	*Milvus migrans*	Accipitridae	Resident	Yes
166	Brahminy Kite	*Haliastur indus*	Accipitridae	Migrant	Yes
167	White-tailed Eagle	*Haliaeetus albicilla*	Accipitridae	Migrant	
168	Lesser Fish-Eagle	*Haliaeetus humilis*	Accipitridae	Migrant	
170	Common Buzzard	*Buteo buteo*	Accipitridae	Migrant	
171	Long-legged Buzzard	*Buteo rufinus*	Accipitridae	Migrant	
Owls					
172	Barn Owl	*Tyto alba*	Tytonidae	Resident	Yes
173	Indian Scops-Owl (Collared Scops-Owl)	*Otus bakkamoena*	Strigidae	Resident	No
174	Pallid Scops-Owl	*Otus brucei*	Strigidae	Migrant	
175	Spotted Owlet	*Athene brama*	Strigidae	Resident	Yes
176	Short-eared Owl	*Asio flammeus*	Strigidae	Migrant	
Hoopoes					
177	Eurasian Hoopoe	*Upupa epops*	Upupidae	Resident	Yes
Hornbills					
178	Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae	Resident	Yes
179	Oriental Pied-Hornbill	*Anthracoceros albirostris*	Bucerotidae	Migrant	
180	Common Kingfisher (Small Blue Kingfisher)	*Alcedo atthis*	Alcedinidae	Migrant	
181	White-throated Kingfisher	*Halcyon smyrnensis*	Alcedinidae	Resident	Yes
182	Pied Kingfisher	*Ceryle rudis*	Alcedinidae	Resident	No
Bee-eaters, Rollers, and Allies					
183	Asian Green Bee-eater	*Merops orientalis*	Meropidae	Resident	Yes
184	Blue-cheeked Bee-eater	*Merops persicus*	Meropidae	Migrant	
185	Blue-tailed Bee-eater	*Merops philippinus*	Meropidae	Migrant	
186	Chestnut-headed Bee-eater	*Merops leschenaulti*	Meropidae	Migrant	
187	European Roller	*Coracias garrulus*	Coraciidae	Migrant	
188	Indian Roller	*Coracias benghalensis*	Coraciidae	Resident	Yes
Barbets and Toucans					
189	Coppersmith Barbet	*Psilopogon haemacephalus*	Megalaimidae	Resident	Yes
190	Brown-headed Barbet (Large Green Barbet)	*Psilopogon zeylanicus*	Megalaimidae	Resident	Yes
Woodpeckers					
191	Eurasian Wryneck	*Jynx torquilla*	Picidae	Migrant	
192	Yellow-crowned Woodpecker	*Leiopicus mahrattensis*	Picidae	Resident	No
193	White-naped Woodpecker	*Chrysocolaptes festivus*	Picidae	Migrant	
194	Black-rumped Flameback (Lesser Goldenbacked Woodpecker)	*Dinopium benghalense*	Picidae	Resident	Yes

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
Falcons and Caracaras					
195	Eurasian Kestrel (Common Kestrel)	*Falco tinnunculus*	Falconidae	Migrant	
196	Red-necked Falcon	*Falco chicquera*	Falconidae	Resident	No
197	Eurasian Hobby	*Falco subbuteo*	Falconidae	Migrant	
198	Laggar Falcon	*Falco jugger*	Falconidae	Resident	No
199	Peregrine Falcon	*Falco peregrinus*	Falconidae	Migrant	
	Parrots, Parakeets, and Allies				
200	Alexandrine Parakeet	*Psittacula eupatria*	Psittacidae	Resident	Yes
201	Rose-ringed Parakeet	*Psittacula krameri*	Psittacidae	Resident	Yes
202	Plum-headed Parakeet	*Psittacula cyanocephala*	Psittacidae	Resident	Yes
203	Budgerigar	*Melopsittacus undulatus*	Psittacidae	Pet escapee	
Cuckooshrikes					
204	Small Minivet	*Pericrocotus cinnamomeus*	Campephagidae	Resident	Yes
205	Long-tailed Minivet	*Pericrocotus ethologus*	Campephagidae	Migrant	
206	Large Cuckooshrike	*Coracina macei*	Campephagidae	Resident	Yes
	Old World Orioles				
207	Indian Golden Oriole	*Oriolus kundoo*	Oriolidae	Resident	Yes
208	Black-hooded Oriole	*Oriolus xanthornus*	Oriolidae	Migrant	
	Vangas, Helmetshrikes, and Allies				
209	Common Woodshrike	*Tephrodornis pondicerianus*	Vangidae	Resident	No
	Fantails				
210	White-browed Fantail	*Rhipidura aureola*	Rhipiduridae	Resident	Yes
	Drongos				
211	Black Drongo	*Dicrurus macrocercus*	Dicruridae	Resident	Yes
212	Ashy Drongo	*Dicrurus leucophaeus*	Dicruridae	Migrant	
213	White-bellied Drongo	*Dicrurus caerulescens*	Dicruridae	Resident	No
214	Hair-crested Drongo (Spangled Drongo)	*Dicrurus hottentottus*	Dicruridae	Migrant	
Monarch Flycatchers					
215	Indian Paradise-Flycatcher	*Terpsiphone paradisi*	Monarchidae	Migrant	
	Shrikes				
216	Isabelline Shrike	*Lanius isabellinus*	Laniidae	Migrant	
217	Brown Shrike	*Lanius cristatus*	Laniidae	Migrant	
218	Bay-backed Shrike	*Lanius vittatus*	Laniidae	Resident	Yes
219	Long-tailed Shrike	*Lanius schach*	Laniidae	Resident	Yes

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
Jays, Magpies, Crows, and Ravens					
221	Rufous Treepie	*Dendrocitta vagabunda*	Corvidae	Resident	Yes
222	House Crow	*Corvus splendens*	Corvidae	Resident	Yes
223	Large-billed Crow	*Corvus macrorhynchos*	Corvidae	Resident	Yes
Fairy Flycatchers					
224	Grey-headed Canary-Flycatcher	*Culicicapa ceylonensis*	Stenostiridae	Migrant	
Tits, Chickadees, and Titmice					
225	Cinereous Tit (Great Tit)	*Parus cinereus*	Paridae	Resident	Yes
	Penduline-Tits and Verdin				
226	White-crowned Penduline-Tit	*Remiz coronatus*	Remizidae	Migrant	
	Larks				
227	Ashy-crowned Sparrow-Lark (Ashy-crowned Finch-Lark)	*Eremopterix griseus*	Alauldidae	Resident	Yes
228	Bengal Bushlark	*Mirafra assamica*	Alauldidae	Resident	Yes
229	Indian Bushlark (Red-winged Bushlark)	*Mirafra erythroptera*	Alauldidae	Resident	Yes
230	Greater Short-toed Lark	*Calandrella brachydactyla*	Alauldidae	Migrant	
231	Bimaculated Lark	*Melanocorypha bimaculata*	Alauldidae	Migrant	
232	Sand Lark	*Alaudala raytal*	Alauldidae	Resident	No
233	Oriental Skylark	*Alauda gulgula*	Alauldidae	Resident	No
234	Crested Lark	*Galerida cristata*	Alauldidae	Resident	Yes
235	Hume's Lark (Hume's Short-toed Lark)	*Calandrella acutirostris*	Alauldidae	Migrant	
Cisticolas and Allies					
236	Common Tailorbird	*Orthotomus sutorius*	Cisticolidae	Resident	Yes
237	Rufous-fronted Prinia	*Prinia buchanani*	Cisticolidae	Resident	No
238	Grey-breasted Prinia	*Prinia hodgsonii*	Cisticolidae	Resident	Yes
239	Delicate Prinia (Indian Graceful Prinia)	*Prinia lepida*	Cisticolidae	Resident	No
240	Jungle Prinia	*Prinia sylvatica*	Cisticolidae	Resident	No
241	Yellow-bellied Prinia	*Prinia flaviventris*	Cisticolidae	Resident	No
242	Ashy Prinia	*Prinia socialis*	Cisticolidae	Resident	Yes
243	Plain Prinia	*Prinia inornata*	Cisticolidae	Resident	Yes
244	Zitting Cisticola	*Cisticola juncidis*	Cisticolidae	Resident	Yes
Reed Warblers and Allies					
245	Booted Warbler	*Iduna caligata*	Acrocephalidae	Migrant	
246	Sykes's Warbler	*Iduna rama*	Acrocephalidae	Migrant	

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
247	Moustached Warbler	*Acrocephalus melanopogon*	Acrocephalidae	Migrant	
248	Paddyfield Warbler	*Acrocephalus agricola*	Acrocephalidae	Migrant	
249	Blyth's Reed Warbler	*Acrocephalus dumetorum*	Acrocephalidae	Migrant	
250	Clamorous Reed Warbler (Indian Great Reed Warbler)	*Acrocephalus stentoreus*	Acrocephalidae	Migrant	
Grassbirds and Allies					
251	Striated Grassbird	*Cincloramphus palustris*	Locustellidae	Migrant	
252	Bristled Grassbird	*Schoenicola striatus*	Locustellidae	Resident	No
Martins and Swallows					
253	Grey-throated Martin (Plain Martin)	*Riparia chinensis*	Hirundinidae	Resident	No
254	Bank Swallow (Sand Martin)	*Riparia riparia*	Hirundinidae	Migrant	
255	Pale Sand Martin (Pale Martin)	*Riparia diluta*	Hirundinidae	Migrant	
256	Dusky Crag-Martin	*Ptyonoprogne concolor*	Hirundinidae	Resident	Yes
257	Barn Swallow	*Hirundo rustica*	Hirundinidae	Migrant	
258	Wire-tailed Swallow	*Hirundo smithii*	Hirundinidae	Resident	Yes
259	Red-rumped Swallow	*Cecropis daurica*	Hirundinidae	Resident	Yes
260	Streak-throated Swallow	*Petrochelidon fluvicola*	Hirundinidae	Resident	Yes
261	Common House-Martin (Northern House-Martin)	*Delichon urbicum*	Hirundinidae	Migrant	
Bulbuls					
262	Red-vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	Resident	Yes
263	Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	Resident	Yes
264	White-eared Bulbul	*Pycnonotus leucotis*	Pycnonotidae	Resident	Yes
Leaf Warblers					
265	Hume's Warbler	*Phylloscopus humei*	Phylloscopidae	Migrant	
266	Brooks's Leaf Warbler	*Phylloscopus subviridis*	Phylloscopidae	Migrant	
267	Sulphur-bellied Warbler	*Phylloscopus griseolus*	Phylloscopidae	Migrant	
268	Tickell's Leaf Warbler	*Phylloscopus affinis*	Phylloscopidae	Migrant	
269	Dusky Warbler	*Phylloscopus fuscatus*	Phylloscopidae	Migrant	
270	Common Chiffchaff	*Phylloscopus collybita*	Phylloscopidae	Migrant	
271	Green Warbler	*Phylloscopus nitidus*	Phylloscopidae	Migrant	
272	Greenish Warbler	*Phylloscopus trochiloides*	Phylloscopidae	Migrant	
273	Western Crowned Warbler	*Phylloscopus occipitalis*	Phylloscopidae	Migrant	
Bush Warblers and Allies					
274	Cetti's Warbler	*Cettia cetti*	Cettiidae	Migrant	
Sylviid Warblers					
275	Lesser Whitethroat	*Curruca curruca*	Sylvidae	Migrant	

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
276	Eastern Orphean Warbler	*Curruca crassirostris*	Sylvidae	Migrant	
	Parrotbills, Wrentit, and Allies				
277	Yellow-eyed Babbler	*Chrysomma sinense*	Paradoxornithidae	Resident	No
	White-eyes, Yuhinas, and Allies				
278	Indian White-eye (Oriental White-eye)	*Zosterops palpebrosus*	Zosteropidae	Resident	Yes
Laughing Thrushes and Allies					
279	Large Grey Babbler	*Argya malcolmi*	Leiothrichidae	Resident	Yes
280	Jungle Babbler	*Argya striata*	Leiothrichidae	Resident	Yes
281	Common Babbler	*Argya caudata*	Leiothrichidae	Resident	Yes
282	Striated Babbler	*Argya earlei*	Leiothrichidae	Resident	No
	Starlings and Mynas				
283	European Starling (Common Starling)	*Sturnus vulgaris*	Sturnidae	Migrant	
284	Rosy Starling	*Pastor roseus*	Sturnidae	Migrant	
285	Indian Pied Starling (Pied Myna)	*Gracupica contra*	Sturnidae	Resident	Yes
286	Brahminy Starling	*Sturnia pagodarum*	Sturnidae	Resident	Yes
287	Chestnut-tailed Starling	*Sturnia malabarica*	Sturnidae	Resident	Yes
288	Common Myna	*Acridotheres tristis*	Sturnidae	Resident	Yes
289	Bank Myna	*Acridotheres ginginianus*	Sturnidae	Resident	Yes
Thrushes					
290	Orange-headed Thrush	*Geokichla citrina*	Turdidae	Migrant	
291	Grey-winged Blackbird	*Turdus boulboul*	Turdidae	Migrant	
292	Tickell's Thrush	*Turdus unicolor*	Turdidae	Migrant	
293	Black-throated Thrush	*Turdus atrogularis*	Turdidae	Migrant	
294	Dusky Thrush	*Turdus eunomus*	Turdidae	Migrant	
Old World Flycatchers					
295	Asian Brown Flycatcher	*Muscicapa dauurica*	Muscicapidae	Migrant	
296	Indian Robin	*Copsychus fulicatus*	Muscicapidae	Resident	Yes
297	Oriental Magpie-Robin	*Copsychus saularis*	Muscicapidae	Resident	Yes
298	Verditer Flycatcher	*Eumyias thalassinus*	Muscicapidae	Migrant	
299	Bluethroat	*Luscinia svecica*	Muscicapidae	Migrant	
300	Ultramarine Flycatcher	*Ficedula superciliaris*	Muscicapidae	Migrant	
301	Taiga Flycatcher (Red-throated Flycatcher)	*Ficedula albicilla*	Muscicapidae	Migrant	
302	Red-breasted Flycatcher	*Ficedula parva*	Muscicapidae	Migrant	
303	Black Redstart	*Phoenicurus ochruros*	Muscicapidae	Migrant	
304	Blue-capped Rock-Thrush	*Monticola cinclorhyncha*	Muscicapidae	Migrant	
305	Blue Rock-Thrush	*Monticola solitarius*	Muscicapidae	Migrant	

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
306	Siberian Stonechat (Common Stonechat)	*Saxicola maurus*	Muscicapidae	Migrant	
307	White-tailed Stonechat	*Saxicola leucurus*	Muscicapidae	Migrant	
308	Pied Bushchat	*Saxicola caprata*	Muscicapidae	Resident	Yes
309	Grey Bushchat	*Saxicola ferreus*	Muscicapidae	Migrant	
310	Desert Wheatear	*Oenanthe deserti*	Muscicapidae	Migrant	
311	Brown Rock Chat (Indian Chat)	*Oenanthe fusca*	Muscicapidae	Resident	Yes
312	Variable Wheatear	*Oenanthe picata*	Muscicapidae	Migrant	
Sunbirds and Spiderhunters					
313	Purple Sunbird	*Cinnyris asiaticus*	Nectariniidae	Resident	Yes
Weavers and Allies					
314	Streaked Weaver	*Ploceus manyar*	Ploceidae	Resident	No
315	Baya Weaver	*Ploceus philippinus*	Ploceidae	Resident	Yes
316	Black-breasted Weaver (Bengal Weaver)	*Ploceus benghalensis*	Ploceidae	Resident	No
Estrildids					
317	Indian Silverbill (White-throated Munia)	*Euodice malabarica*	Estrildidae	Resident	Yes
318	Scaly-breasted Munia (Spotted Munia)	*Lonchura punctulata*	Estrildidae	Resident	Yes
319	Tricolored Munia (Black-headed Munia)	*Lonchura malacca*	Estrildidae	Resident	No
320	Chestnut Munia	*Lonchura atricapilla*	Estrildidae	Migrant	
321	Red Avadavat	*Amandava amandava*	Estrildidae	Resident	No
Old World Sparrows					
322	House Sparrow	*Passer domesticus*	Passeridae	Resident	Yes
323	Spanish Sparrow	*Passer hispaniolensis*	Passeridae	Migrant	
324	Yellow-throated Sparrow (Chestnut-shouldered Petronia)	*Gymnoris xanthocollis*	Passeridae	Resident	No
Wagtails and Pipits					
325	Forest Wagtail	*Dendronanthus indicus*	Motacillidae	Migrant	
326	Grey Wagtail	*Motacilla cinerea*	Motacillidae	Migrant	
327	Western Yellow Wagtail	*Motacilla flava*	Motacillidae	Migrant	
328	Citrine Wagtail	*Motacilla citreola*	Motacillidae	Migrant	
329	White-browed Wagtail (Large Pied Wagtail)	*Motacilla maderaspatensis*	Motacillidae	Resident	Yes
330	White Wagtail	*Motacilla alba*	Motacillidae	Migrant	
331	Richard's Pipit	*Anthus richardi*	Motacillidae	Migrant	
332	Paddyfield Pipit	*Anthus rufulus*	Motacillidae	Resident	Yes
333	Long-billed Pipit	*Anthus similis*	Motacillidae	Migrant	

Sl. No.	Common Name	Scientific Name	Family	Migrant/ resident	Urban
334	Tawny Pipit	*Anthus campestris*	Motacillidae	Migrant	
335	Rosy Pipit	*Anthus roseatus*	Motacillidae	Migrant	
336	Tree Pipit	*Anthus trivialis*	Motacillidae	Migrant	
337	Olive-backed Pipit	*Anthus hodgsoni*	Motacillidae	Migrant	
338	Red-throated Pipit	*Anthus cervinus*	Motacillidae	Migrant	
339	Water Pipit	*Anthus spinoletta*	Motacillidae	Migrant	
	Finches, Euphonias, and Allies				
340	Common Rosefinch	*Carpodacus erythrinus*	Fringillidae	Migrant	
	Old World Buntings				
341	Crested Bunting	*Emberiza lathami*	Emberizidae	Migrant	
342	Black-headed Bunting	*Emberiza melanocephala*	Emberizidae	Migrant	
343	Red-headed Bunting	*Emberiza bruniceps*	Emberizidae	Migrant	
344	White-capped Bunting (Chestnut-breasted Bunting)	*Emberiza stewarti*	Emberizidae	Migrant	
345	Grey-necked Bunting (Grey-hooded Bunting)	*Emberiza buchanani*	Emberizidae	Migrant	
Flowerpeckers					
346	Thick-billed Flowerpecker	*Dicaeum agile*	Dicaeidae	Migrant	

Table 12: List of Amphibians

Sl. No.	Common Name	Scientific Name	Family
1	Common Toad	*Bufo melanostictus*	Bufonidae
2	Green Pond Frog	*Euphylyctishex adactylus*	Dicroglossidae
3	Indian Bull Frog	*Hoplobatrachus tigerinus*	Dicroglossidae
4	Marbled Toad	*Bufosto maticus*	Bufonidae
5	Skittering Frog	*Euphylyctis cynoaphylctis*	Dicroglossidae

Annexure 2 – List of Parks

Table 13: Parks in Horticulture Division 2

Sl. No.	Sector	Number of Parks	Area (in Acres)
1	2	3	4
2	28	1. H. No. 450 Ward No. 2A	0.47
		2. Ward No. 2 Park	1.48
3	29	1. Shaheed Memorial	1.28
		2. Behind Ganga Shopping	1.5
4	30	1. A Block	0.7
		2. B Block	0.88
		3. C Block	0.78
		4. D Block	1
		5. E Block	0.77
		6. Bhimrao Ambedkar Hospital	0.93
5	31	1. A-49	0.65
		2. A-205	0.66
		3. A-223	0.17
		4. A-394	0.26
		5. B Block park	0.46
		6. C 4/141	0.74
		7. C 3/158	0.59
		8. C-6 Park	2.8
		9. C-6 Group Housing	0.48
6	33	1. Behind A Block drain	1.04
		2. A Block Children Park	1.48
		3. A-15 Angoori Devi Park	0.77
		4. B-29 Park	0.64
		5. B-68 Park	0.93
		6. C-54 Beside Dipakshi	1.64
7	34	1. B-1	0.51
		2. B-2	1.73
		3. B-3	0.39
		4. B-4	1.63
		5. B-6	1.69
		6. B-8	2.64
		7. B-9	0.5
		8. B-10	0.33
		9. B-11	1.65
		10. B-11A	0.85
		11. B-10A Chhota Park	0.23
		12. C-71	2.07
		13. C-31	0.75

Sl. No.	Sector	Number of Parks	Area (in Acres)
		14. C-72 Nilgiri	0.12
		15. C-76 Nilgiri Third	0.72
		16. A-69A	1.22
		17. A-92A	0.71
		18. A-9A	1
		19. B-5	0.22
		20. B-14	0.4
		21. B-12A	0.48
		Nari Niketan	0.31
8	35	1. Opp. A-73	0.85
		2. Opp. Shivalik Flats	0.74
		3. Behind Shivalik Bhawan	1.16
		4. Bus Stand	1.72
9	36	1. B-Block Park	2.39
		2. C-Block Park	0.34
		3. D-Block Park	2.58
		4. E-Block Park	0.47
10	37	1. Shashikant park	0.83
		2. Manoj Vatika	0.63
		3. Ambedkar Park	1.19
		4. Ashok Vatika	0.98
		5. Ward No. 18	0.55
		6. Ward No. 04	0.65
		Krishna Sahay Park	
11	39	1. A Block	0.42
		2. B Block	0.96
		3. C Block	1
		4. D Block	1.37
		5. E Block	0.87
		6. F Block	0.87
		7. G Block	0.69
		8. H Block	0.57
12	40	1. A Block	1.5
		2. B Block	0.56
		3. C Block	1.42
		4. C Block	0.22
		5. D Block	0.22
		6. D Block	0.44
		7. D Block	1.09
		8. D Block	1.26
		9. E Block	1.24
		10. Centre Park	1.02
		11. F Block	6.49
13	41	1. A-Block	1
		2. B-Block	1
		3. C-Block	0.61

Sl. No.	Sector	Number of Parks	Area (in Acres)
		4. D-Block	1.05
		5. E-97E	1.36
		6. E-137 E	0.32
		7. F-Block	0.86
		8. F-Block	0.32
		9. F-Block	0.33
		10. G-Block	0.56
		11. I-Block	0.62
		12. I-Block	0.26
		13. J-Block	1.15
14	42	1. A-100	1.31
		2. D-67	0.72
15	43	1. A-37	4.39
		2. A-167	0.53
		3. A-251	0.39
		4. B-87	0.39
		5. Beside B-47	0.76
		6. B-Block Master Green	3.08
		7. C-Block Master Green	1.83
16	44	1. Opp. A-37	3.53
		2. Opp. B-17	1.94
		3. Opp. B-28	1.65
		4. Opp. C-12	2.17
		5. C-1 to 11	1.16
		6. C-165	0.84
		7. C-200	1.07
		8. Beside Gate No. 3	1.5
		9. F-Block	1.61
		10. G-Block	1.84
		11. L-shaped D-12	1.76
		12. Electricity House next to Block C	1.52
17	45	1. Park - 1	0.17
		2. Park - 2	0.17
18	46	1. A 578 Park	1.3
		2. A 402 Park	0.87
		3. A 264 Park	1.59
		4. A-188	0.69
		5. B-156	0.86
19	47	1. D 57 Park	1.38
		2. D 116 Park	0.08
		3. D 252 Park	1.68
		4. D 206 Park	1.5
		5. A 125 Park	0.38
		6. A 258 Park	0.31
		7. A-458 Park	0.38
		8. B-38	0.67

Sl. No.	Sector	Number of Parks	Area (in Acres)
		9. C-36	2.39
		10. D-209	6.51
		11. D-33A	4.36
		12. D-33B	1.87
20	48	1. D 60 Park	1.61
		2. A 181 Park	0.33
		3. C-164	1.1
		4. D-147	3.36
		5. B-Block	0.46
		6. D-Block Master Green	1.4
21	49	1. A Block	1.15
		2. B Block	0.41
		3. C Block	0.47
		4. C Block	0.18
		5. D Block	0.41
		6. B Block Toilet	0.14
		7. D Block	0.15
		8. Beside Baraat Ghar	0.75
22	50	1. Meghdootam Park	28
		2. A Block	2.7
		3. B Block	2.47
		4. C Block	1.48
		5. C Block	1.69
		6. D Block	0.43
		7. D Block	0.83
		8. E-5	2.85
		9. E-2	6.84
		10. E Block near 98/28	1.53
23	51	1. A Block	2.8
		2. B Block	1.59
		3. B Block	1.3
		4. B Block	0.22
		5. C Block	1.45
		6. C Block	0.45
		7. D Block	0.5
		8. Children Park	6.85
24	52	1. A Block	1.57
		2. B-136	1.04
		3. C-56	0.54
		4. B-191	2.87
		5. L-shaped Park	4.47
		6. E-94	1
		7. Aravalli	0.49
		8. E-54	1.94
		9. D-56	0.91

Sl. No.	Sector	Number of Parks	Area (in Acres)
		10. E-3 Shatabdi Vihar	0.32
		11. E-5 Shatabdi Vihar	0.22
25	53	1. Beside A-23	0.35
		2. Park beside A-18	0.61
		3. Park beside A-50	0.33
		4. Beside A-51	0.4
		5. B-28A Park	0.15
		6. B-56A Park	0.16
		7. C-69A Park	0.14
		8. C-82A Park	0.24
		Kanchenjunga	
		9. F Block	0.46
		10. G Block	0.47
		11. D Block	0.43
		12. C Block	0.49
		13. B Block	0.54
		14. E Block	0.53
		15. A Block	0.19
		16. A Block	0.05
26	61	1. Sai Mandir Park	0.32
		2. D-132	1.21
		3. C-134	0.5
		4. C-108	2
		5. C-80A	0.9
		6. E-13	1.85
		7. E-9	0.8
		8. Triphala Park	5.42
		9. E-11	3.42
		10. Mansarovar Apartment	0.4
		11. E-17	0.65
		12. Shivalik Flat Park	0.6
		13. Shanti Kunj Flat Park	0.35
		14. E-15	0.2
		15. Baraat Ghar Park	0.5
		16. B Block Park	0.85
		17. Gol Chakkar	0.65
		18. A-121A	0.6
27	74	1. Near Capetown	3.25
28	76	2. A-Block Park	3.31
29	77	1. Sector-116	6
30	94 adjoining 44	Mahamaya Fly Over Park	27.5
31	99	1. M.I.G Flat (Playground Park)	3.72
		2. Park M.I.G Flat	0.22
		3. Park M.I.G Flat	0.15
		4. Park M.I.G Flat	0.2

Sl. No.	Sector	Number of Parks	Area (in Acres)
		5. B Block Opp. Sector-99	1.67
32	100	1. Park - 1	6.58
		2. A-Block park	0.61
		3. B-Block Park First B-2	0.71
		4. B-Block Park C-116	0.77
		5. C-Block Parck C-116	0.49
		6. Century Park	0.4
33	105	1. A 46 Park	1.75
		2. A-57	
		3. B 374 Park	2.2
		4. C 246 Park	2.71
		5. D 305 Park	1.62
		H.I.G FLAT	
		A. BLOCK A	
		6. Park	0.21
		7. Park	0.21
		B. BLOCK B	
		8. Park	0.67
		C. BLOCK C	
		9. Park	0.2
		10. Park 2	0.2
		11. Plus Type Park	10.64
		12. S.P-01 Park	9.5
34	108	1. A-107 Park	1.04
		2. 91 B Park	1.92
		3. C-208 B Park	1.45
		4. D-66 B Park	0.79
		5. D-335 Park	0.93
		6. S.P-01 Park	5.97
		7. Loop Park	13.92
35	112	1. Master Green Park in Sector-113 and Sector-175	1.8
36	116	1. A-Block Park	5
		2. B-Block Park	5.5
		3. C-Block Park	8
37	117	1. Master Green Park in Sector -120	46
38	126	Plot No. 03 Sector-126	1.09
39	128	Loop	28
40	130	Within 5% fragmented land	0.25
41	131	In Between Farm House	
		1. Park	0.96
		2. Park	1.3
		3. Park	0.46
		4. Park	1.42
		5. Park	0.5

Sl. No.	Sector	Number of Parks	Area (in Acres)
42	Baraula Gram	Park	9.31
43	Morna	Mandir Park	0.65
		School Park	1.82
44	Nithari	Primary School Park	0.38
		Mandir Park	1.82
45	Gijhod	School Park	1.21
46	Raipur	Near Water Tank	0.25
47	Aagahpur	Mandir Park	0.68
48	Sultanpur	Park	0.5
		School Park	0.4
		Total Number of Parks	**Total Area**
		268	**626.62**

Table 14: Green Belts in Horticulture Division 2

Sl. No.	Sector	Location	Area (in Acres)
1	33	Opp. A.B.C Block	4.38
		Beside Nala	0.35
		Beside Nursery	1.72
2	34	Around the sector	8.29
3	35	Around the sector	2.47
		Beside Ganga water	0.96
		Beside Kribko	1.27
4	36	Around the sector	5.8
5	37	Around the sector	3.5
6	38 A	Beside MP Third	6.6
7	39	Nursery to Shashi Chowk	1.71
8	40	Around the sector	4.5
9	42	DSC Road A Block	4.42
10	43	DSC Road A Block	2.31
11	44	Opp. Amity School Sector-37	12.16
		G-155	1.22
		FF&G Block	3.84
		Kanshiram Yojana Opp. Chalera village	3.69
		G Block	2.1
12	45	Green Belt Opp. Sector-46	1.03
13	46	Green Belt Beside Block A,B,C & D	9.85
14	46	B Block Green Belt Opp. Sector-99	1.67
15	47	Green Belt Beside Block A,B,C & D	5.1
16	48	Green Belt Beside Block A,B,C & D	5.6
17	50	Beside Nala	1.95
		Beside Alok Vihar	3.38
		Beside A,B,C Block	2.32
		Beside E & D Block	3.84
		Beside STP	3.25
18	51	Beside Nala	2.15
		Around the sector	8.52

Sl. No.	Sector	Location	Area (in Acres)
		Near village	0.5
19	52	Around the sector	6.61
		Opp. Aravalli	2.85
20	61	Around the sector	4.69
21	75	Near Sector-72	7.2
22	76	Near Sector-50	1.4
23	77	Near Sector-116	10
24	78	Below High tension line	5
25	96.97.98	Around the sector	9.4
26	99	Around the sector	10
27	100	Opp. Sector-47.98 & 105	10.46
28	100	Opp. Sector 99 & 98	3.04
29	104	Both sides	1
30	105	Green Belt	6
31	105	Green Belt	3
32	107	Green Belt	2
33	107	Green Belt	5
34	108	Master Green Belt	10
35	112	Sector-115	2
36	115	Beside water tank and F&G	40
37	116	Near Sector-77 and 116	15
38	117	Sector-74	6.4
39	128	Beside Yamuna bridge	8.6
40	131	Beside Yamuna Bridge	11.15
41	133	Beside Yamuna bridge	6.6
		Number of Green Belts	**Total Area**
		56	**307.85**

Table 15: Roadside Plantations in Horticulture Division 2

Sl. No.	Sector	Location	Length (Road in Km.)
1	2	3	**4**
1	78	D/o R.S.P Two year maintenance of Sector 78	2.5
2	94 to 134	D/o R.S.P Two year maintenance of 84 to 134 (Yamuna Pushta)	7
3	42,46,47	M/o R.S.P Central Verge Sector 42,46,47 Two year maintenance	5
4	DSC Road	M/o R.S.P Two year maintenance Shashi Chowk City Centre to DSC Road	2
5	47,48,46,47	M/o R.S.P Between sector 47,48,46,47 two year maintenance	5
6	Shivalik Marg	M/o R.S.P with two year maintenance Shivalik marg central verge (City centre to DSC Road)	1
7	61	Internal Road (Old trees)	16
8	50	M/o R.S.P Two year maintenance of Sector 50, Part - II, Central Verge	2.6
9	43	M/o R.S.P Two year maintenance of Sector 43	5

Sl. No.	Sector	Location	Length (Road in Km.)
10	29	M/o R.S.P Two year maintenance of Ganga Shopping Complex, Brahmaputra, Sector 29, Noida	2
11	117	M/o R.S.P Two year maintenance of Sector 117	3
12	107, DSC Road	M/o R.S.P in Sector 107 & DSC Road to 105 highway with two year maintenance	5
13	100	M/o R.S.P Sector 100 with two year maintenance	2
14	116	M/o R.S.P with two year maintenance Sector 116, Noida	12
15	108	M/o R.S.P Sector 108 with two year maintenance	5
16	42,44,46,45	M/o R.S.P Two year maintenance of sector 42,44,46,45 Central verge	6
17	MP-III	M/o R.S.P Two year maintenance of MP-III under the over bridge	0.5
18	74,77,78,79	D/o R.S.P Two year maintenance of sector 74.77.78.79 central verge	6.5
19	28	Internal Road (Old trees)	2
20	71 chowk to 49	D/o R.S.P Sector 71 Chowk to Sector 49, Bridge line with two year maintenance	3.5
21	45,46	D/o R.S.P Beetween sector 45.46 with side verge with two year maintenance	5
22	MP-III	D/o R.S.P Central verge with two year maintenance of MP-III (Sector 51 Petrol pump to sector 71 chowk)	5.5
23	74,75,76	D/o R.S.P Sector 74,75,76 with two year maintenance	6.5
24	Shivalik Marg	D/o R.S.P with two year maintenance Shivalik Marg under pass near N.T.PC (Prakash Hospital)	0.5
25	50	D/o R.S.P Sector-50, Bridge to D.S.C Road with one year maintenance	2
26	35	D/o R.S.P Morna, Bus stand Sector 35 with one year maintenance	0.3
27	51 to 72	D/o R.S.P Central verge between sector 51 to 72 with two year maintenance	1
28	Shivalik Marg	D/o R.S.P Shivalik Marg road, Prakash Hospital to city center under pass with two year maintenance	1
29	61	D/o R.S.P with two year maintenance Sector-61, Noida	1
30	29	Internal Road (Old trees)	2.5
31	78,79	D/o RSP with two year maintenance between sector 78,79 Noida	3
32	45	M/o R.S.P Two year maintenance of Sector 45, Noida	3
33	100	M/o R.S.P (Central Verge Sector 100, two year maintenance)	1
34	43,45	M/o R.S.P Two year maintenance of sector 43, 45	2
35	28,29,37	M/o R.S.P Two year maintenance of Sector 28,29,37	5
36	Shivalik Marg	M/o R.S.P Shivalik Marg under pass with two year maintenance	0.5
37	52	M/o R.S.P Two year maintenance sector 52, Noida	12.5

Sl. No.	Sector	Location	Length (Road in Km.)
38	115	M/o R.S.P Village Saurkha Play GroundPart-I, II, Sector 115, Two year maintenance	5.5
39	30	Internal Road (Old trees)	4
40	115	M/o R.S.P Two year maintenace of Sector 115, near F.N.G Between Sector 115, 79, 116	3
41	105 & 108	M/o R.S.P Sector 105 & 108 Two year maintenance	3
42	44	M/o R.S.P Two year maintenance of Sector 44, F & G Block	2
43	112	M/o R.S.P Two year maintenance of Internal road sector 112	6
44	115	M/o R.S.P Two year maintenance of Sector 115, Noida	2.5
45	52	Internal Road (Old trees)	18
46	104 & 105	M/o R.S.P Sector 104 & 105 Two year maintenance	3
47	37	M/o R.S.P with two year maintenance, DSC Road under pass Sector 37 to in front village chelara	0.5
48	50	M/o R.S.P Sector 50 Drain Bridge to D.S.C Road side & Sector 78 to 112 & 76 to 116, 74	5.5
49	Nithari marg	M/o R.S.P Two year maintenance of Road no. 8 & Nithari Marg	2
50	52	M/o R.S.P Two year maintenance of Kamal Marg Sector 52	2
51	50	M/o R.S.P Sector 50, Two year maintenance	2.5
52	41	M/o R.S.P Sector 41 Two year maintenance Sector 39, 41 Chowk to D.S.C Road	0.5
53	100	M/o R.S.P Sector 100, Two year maintenance	0.5
54	99	M/o R.S.P Central verge Sector 99, two year maintenance	0.5
55	53	Internal Road (Old trees)	18
56	30, 31	M/o R.S.P, Nithari Marg between Sector 30, 31 Two year maintenance	0.5
57	MP-II	M/o, R.S.P Two year maintenance of MP-II Central verge Triangle sector 37 to 51 petrol pump	5
58	33	M/o R.S.P Sector 33	2
59	94	M/o R.S.P Two year maintenance of R.S.P Roundabout Triangular Sector 94	0.5
60	105	M/o R.S.P Sector 105, H.I.G Flats, Two year maintenance	1
61	44	M/o R.S.P Two year maintenance Sector 44 central verge from tripod to 45 mtr road B & C Block	5
62	31	Internal Road (Old trees)	3
63	78,79	M/o R.S.P Sector 78,79 Two year maintenance	4.5
64	31, 36	M/o RSP Two year maintenance of Nithari road along nala sector 31, 36	1
65	115 to 118	M/o RSP Sector 115 to 118 near 45 mtr wide road two year maintenance	3
66	51	Internal Road (Old trees)	18

Sl. No.	Sector	Location	Length (Road in Km.)
67	34	M/o RSP Sector 34 two year maintenance	5
68	77, 112, 116, 117, 75, 76	M/o RSP Sector- 77, 112, 116, 117, 75, 76 One year maintenace	8
69	37	M/o RSP Two year maintenance of Sector 37 Fly over to Yamuna pushta	2
70	94, 125	M/o RSP Sector 94, 125 with two year maintenance	5
71	Mahamaya Fly over to Shahdara drain	M/o RSP Two year maintenance of central verge T Point Mahamaya Fly over to Shahdara drain	1
72	50	Internal Road (Old trees)	15
73	DSC Road near Chalera village	D/o RSP U-turn with two year maintenance DSC Road Central verge near chalera village noida	0.5
74	52	M/o RSP Sector 52 Sai Dham Road Two year maintenance	1
75	105	M/o RSP Two year maintenance of Sector - 105, Noida	2
76	34	Internal Road (Old trees)	20
		Total Number of Plantations	**Total km.**
		76	**323**

Annexure 3 – Connectivity Details for Indicator 2

Patch Name	Area ha	Area X Area
A1	2063.08	4256299.09
A2	64	4095.95
A3	62.62	3921.64
A4	49.96	2496.43
A5	32.22	1038.43
A6	27.1	734.33
A7	22.62	511.61
A8	16.33	266.52
A9	10.39	107.97
A10	8.86	78.5
A11	4.49	20.2
A12	4.18	17.44
A13	3.75	14.08
A14	3.67	13.47
A15	3.37	11.34
A16	3.3	10.92
A17	1.65	2.71
A18	1.23	1.5
A19	0.41	0.17
Total		**4269642.31**

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