

**Conspectus of Tree Wealth Conserved in the Botanic Garden of Indian Republic, Noida,
India**

ABSTRACT

The Botanic Garden of Indian Republic (BGIR) was established in 1997 in NOIDA under the Botanical Survey of India, Ministry of Environment, Forest and Climate Change. Spanning an area of 164.85 acres, the garden has been dedicated to fulfilling its core mandate, particularly the ex-situ conservation of endemic and threatened plant species from various regions across the country. Since its inception, continuous efforts have been made to achieve the goals of the garden's establishment. Currently, despite the region's extreme and contrasting climatic conditions, BGIR serves as a national repository and safe haven for over 5,011 individual plants from 175 species of angiosperm trees, representing 133 genera across 38 families. The garden conserves 141 taxa listed in the IUCN Red List of Threatened Species (version 3.1), including: 127 species categorized as Least Concern (LC), 3 as Near Threatened (NT), 7 as Vulnerable (VU), 2 as Endangered (EN), and 2 as Critically Endangered (CR). The Critically Endangered angiosperms conserved in BGIR are *Commiphora wightii* (Arn.) Bhandari and *Hildegardia populifolia* (Roxb.) Schott & Endl. All the taxa within BGIR are thriving and growing luxuriantly in the garden.

Keywords: *Botanical Survey; Climate Change; Environment; Forest; Plant Species*

1. INTRODUCTION

Botanical Gardens play a crucial role in conservation, scientific research and citizen science by preserving biodiversity, supporting ecological studies, and aiding in habitat restoration efforts ([Insert references](#)). They serve as living laboratories where scientists study plant genetics, climate adaptability, and medicinal properties (Heywood, 2017). Additionally, these gardens contribute to public education and awareness about endangered species and sustainable practices (Wyse Jackson & Sutherland, 2000). Through seed banks and conservation

programs, botanical gardens help in protection of rare and threatened plant species from extinction (Mounce & al., 2017). The botanical gardens can be used as a common platform, where researchers can conduct comparative studies of conservation, propagation, horticulture, seed science, taxonomy, systematics, genetics, biotechnology, education, restoration ecology, public education, plant physiology, anatomy and responses to climate change and much more (Maunder & al., 2001; Donaldson, 2009; Sellmann & Bogner, 2013; Chen & Sun, 2018; Primack & al., 2021). Botanic Garden of Indian Republic (BGIR), Noida is also contributing in aforesaid studies by conserving 5011 trees.

2. Methods and materials

2.1 Study Location & Description

Botanic Garden of Indian Republic (BGIR) was established in 1997 and is situated in Noida within the National Capital Region (NCR) under the jurisdiction of the Botanical Survey of India, Ministry of Environment, Forest & Climate Change. The Botanic Garden of the Indian Republic is spread over 164.85-acre and is situated at 28°33'27" N. lat. to 28°34'00" N. lat. and 77°19'16" E. long to 77°20'13" E. long (Figure 1, 2). The area is located in the flood plain of river Yamuna and has alluvial soil, representing fairly coarse sand with a very fine texture on the surface soil, greyish-brownish to grey depending upon depth, deficient in nitrogen, humus and phosphoric acid. However, soil contains a high percentage of soluble salts of sodium, calcium and magnesium as the pH of the soil is alkaline and moisture content is very low during most of the year. Over the years, BGIR has evolved into a sanctuary which is dedicated to the conservation of endemic and threatened plant species from diverse ecological zones across the country, fulfilling a vital role in their ex-situ conservation and the requirement of agreement, International Agenda and Global Mission through Botanical Survey of India with the following objectives i.e. (i) Ex-situ Conservation of endemic and threatened plant species of representative ecosystems of the country, (ii) Serve as a 'Centre of Excellence' for research and training and (iii) To create public awareness through educational programmes on plant diversity and conservation. Before the establishment of this garden, the land area was under cultivation of cereal crops where the natural vegetation represented by *Azadirachta indica* A.Juss., *Bombax ceiba* L., *Cassia fistula* L., *Dalbergia sissoo* Roxb., *Morus alba* L. and *Tamarix aphylla* (L.) H.Karst. Currently,

despite the region's extreme and contrasting climatic conditions, BGIR serves as a national repository and haven for over 5,011 individual plants.

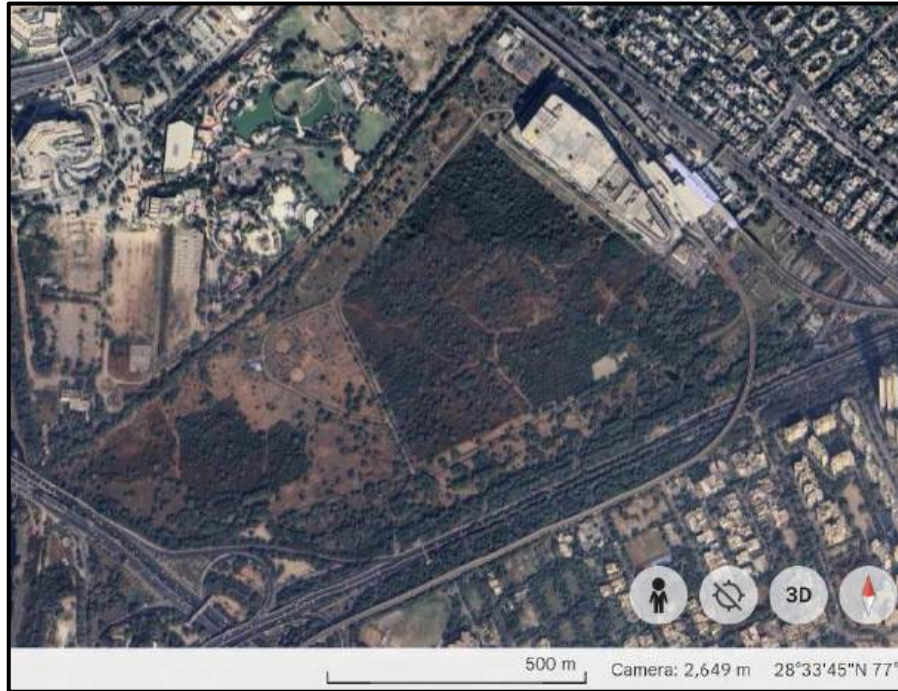


Figure 1: Google Earth Image of Botanic Garden of Indian Republic (BGIR), Noida (Location Map).



Figure 2: Spatial Analysis of trees of Botanic Garden of Indian Republic (BGIR), Noida

2.2 Data Collection

Plant samples of the tree species were collected in duplicates/triplicates from different zones/sections in flowering and fruiting. These trees are mainly conserved in eight Forest Zones established along the peripheral area adjacent to the boundary wall of the Garden and adjoining area, different plant sections and the central open area of the garden. The representation of these zones and sections is as follows- 1. Forest Zone-1: Tropical Wet Evergreen Forest, 2. Forest Zone-2: Tropical Semi-Evergreen Forest, 3. Forest Zone-3: Tropical Moist-Deciduous Forest, 4. Forest Zone-4: Dry - Deciduous Forest, 5. Forest Zone-5: Thorny Scrub Forest, 6. Forest Zone-6: Tropical Dry Evergreen Forest, 7. Forest Zone-7: Sub-Tropical Broadleaf Forest, 8. Forest Zone-8: Sub-Tropical Dry Forest, 9. Economic Plant Section (EPS), 10. Medicinal Plant Section (MPS), 11. Fruit Plant Section (FPS) 12, Central Open Area, 12. Central Open Area. The specimens were critically studied for morphological details and for correct identification. Identification was confirmed by consulting standard literature and through reference against identified herbarium specimens at Botanical Survey of India, Western Regional Centre herbarium, Pune (BSI), Central National Herbarium (CAL), Southern Regional Centre herbarium (MH). Web databases such as International Plant Names Index (IPNI), Biodiversity Heritage Library, Global Biodiversity Information Facility (GBIF) and Plants of the World Online (POWO) were also consulted for correct nomenclature, author citation and additional information.

3. Results

The present study resulted in the documentation of 175 angiosperms tree taxa. Presently, the garden houses over 5,011 individual plants representing 175 species of angiosperm trees, encompassing 133 genera across 38 families (Figure 5). This is mainly based on the native as well as exotic tree taxa conserved in the botanical garden and few naturally occurring taxa are also included in this documentation.

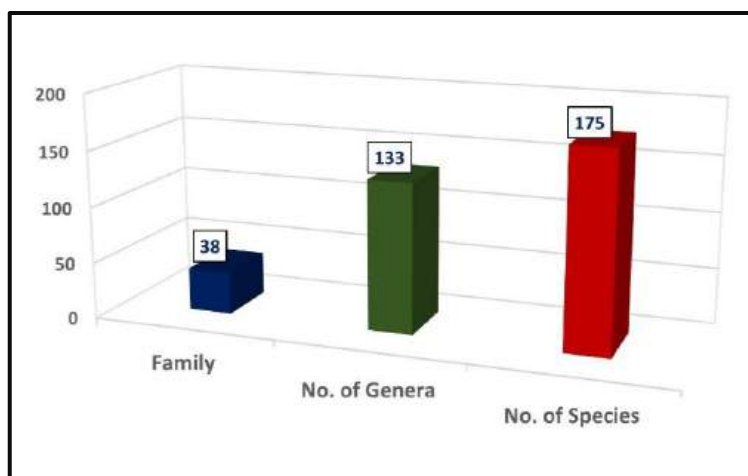


Figure 3: graphical representation of no. of families, genera and species

The five dominant families of the BGIR are viz., Fabaceae (28 genera, 40 spp.), Malvaceae (12 genera, 14 spp.), Bignoniaceae (11 genera, 11 spp.), Rutaceae (6 genera, 11 spp.), Moraceae (3 genera, 9 spp.).

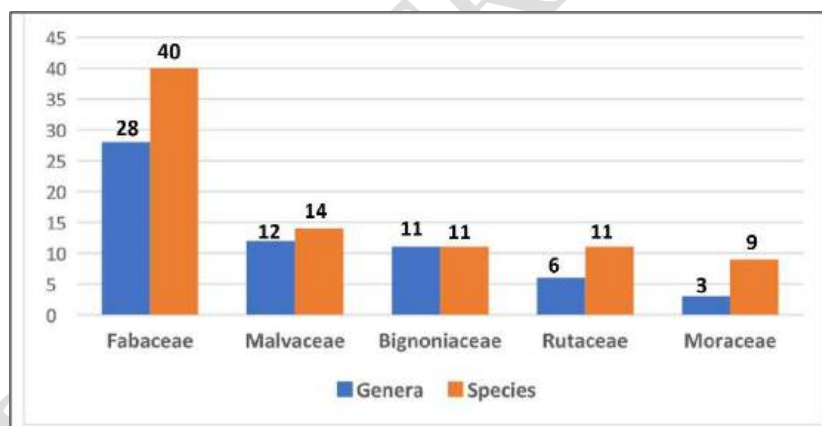


Figure 4: Five dominant families

Table 1. Analysis of the Tree Species

Sl. No.	Family	No. of Genus	No. of Species
1.	Anacardiaceae	4	4
2.	Annonaceae	2	2
3.	Apocynaceae	5	7
4.	Arecaceae	4	5
5.	Bignoniaceae	11	11
6.	Boraginaceae	2	3

7.	Burseraceae	1	1
8.	Capparaceae	1	1
9.	Casuarinaceae	1	1
10.	Celastraceae	1	1
11.	Combretaceae	2	7
12.	Elaeocarpaceae	1	1
13.	Euphorbiaceae	3	3
14.	Fabaceae	28	40
15.	Lamiaceae	4	5
16.	Lauraceae	2	2
17.	Lecythidaceae	2	2
18.	Loganiaceae	1	1
19.	Lythraceae	2	2
20.	Malvaceae	12	14
21.	Meliaceae	5	5
22.	Moraceae	3	9
23.	Moringaceae	1	2
24.	Myrtaceae	5	7
25.	Oleaceae	1	1
26.	Phyllanthaceae	3	5
27.	Putranjivaceae	1	1
28.	Rhamnaceae	1	1
29.	Rosaceae	1	1
30.	Rubiaceae	5	5
31.	Rutaceae	6	11
32.	Salvadoraceae	1	1
33.	Santalaceae	1	1
34.	Sapindaceae	2	3
35.	Sapotaceae	4	5
36.	Simaroubaceae	2	2
37.	Tamaricaceae	1	1
38.	Ulmaceae	1	1
	Total	133	175

In the present study approximately 5011 trees are conserved in different Forest Zones and Plant Sections i.e., Forest Zone 1 (418), Forest Zone 2 (724), Forest Zone 3 (414), Forest Zone 4 (265), Forest Zone 5 (246), Forest Zone 6 (347), Forest Zone 7 (569), Forest Zone 8 (690), Economic Plant Section (EPS) (478), Medicinal Plant Section (MPS) (121), Fruit Plant Section (FPS) (218), Central Open Area (521).

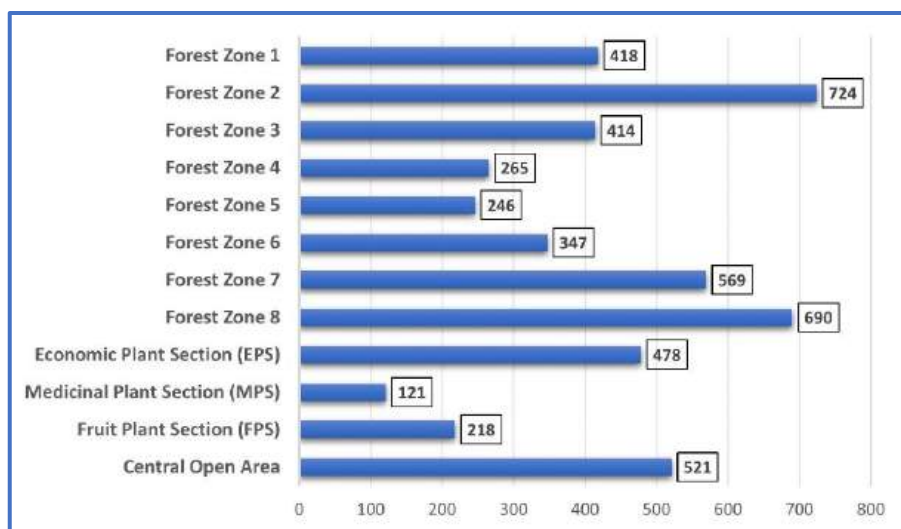


Figure 5: Zone/Section-wise number of trees

The garden conserves 141 taxa listed in the IUCN Red List of Threatened Species (version 3.1), including: 127 species categorized as Least Concern (LC), 3 as Near Threatened (NT), 7 as Vulnerable (VU), 2 as Endangered (EN) and 2 as Critically Endangered (CR), from remaining species 6 are Data Deficient (DD) and 28 are Not Evaluated (NE). All the taxa within BGIR are thriving and growing luxuriantly in the garden.

Table 2: List of tree taxa conserved in BGIR, listed in the IUCN Red List of Threatened Species with their category & criteria.

Sl. No.	Name of the plant	Family	Number of trees in BGIR	IUCN Red List Category & Criteria
1.	<i>Commiphora wightii</i> (Arn.) Bhandari	Burseraceae	3	CR A2cd
2.	<i>Hildegardia populifolia</i> (Roxb.) Schott & Endl.	Malvaceae	21	CR D
3.	<i>Mangifera indica</i> L.	Anacardiaceae	16	DD
4.	<i>Ehretia aspera</i> Willd.	Boraginaceae	39	DD
5.	<i>Elaeodendron glaucum</i> (Rottb.) Pers.	Celastraceae	10	DD
6.	<i>Millettia peguensis</i> Ali	Fabaceae	5	DD
7.	<i>Parkia biglandulosa</i> Wight & Arn.	Fabaceae	4	DD
8.	<i>Ailanthus excelsa</i> Roxb.	Simaroubaceae	8	DD
9.	<i>Tecomella undulata</i> D.Don	Bignoniaceae	5	EN A2a

10.	<i>Tectona grandis</i> L.f.	Lamiaceae	24	EN A2cd
11.	<i>Buchanania lanzan</i> Spreng.	Anacardiaceae	1	LC
12.	<i>Spondias pinnata</i> (L. f.) Kurz	Anacardiaceae	23	LC
13.	<i>Annona squamosa</i> L.	Annonaceae	8	LC
14.	<i>Monoon longifolium</i> (Sonn.) B. Xue & R.M.K. Saunders	Annonaceae	78	LC
15.	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	3	LC
16.	<i>Holarrhena pubescens</i> Wall. ex G.Don	Apocynaceae	4	LC
17.	<i>Plumeria alba</i> L.	Apocynaceae	214	LC
18.	<i>Plumeria obtusa</i> L.	Apocynaceae	8	LC
19.	<i>Plumeria rubra</i> L.	Apocynaceae	2	LC
20.	<i>Thevetia peruviana</i> (Pers.) K. Schum.	Apocynaceae	20	LC
21.	<i>Wrightia tinctoria</i> (Roxb.) R.Br	Apocynaceae	13	LC
22.	<i>Bismarckia nobilis</i> Hildebrandt & H.Wendl.	Arecaceae	2	LC
23.	<i>Livistona chinensis</i> (Jacq.) R.Br. Ex Mart.	Arecaceae	23	LC
24.	<i>Phoenix dactylifera</i> L.	Arecaceae	1	LC
25.	<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	5	LC
26.	<i>Roystonea regia</i> (Kunth) O.F. Cook	Arecaceae	69	LC
27.	<i>Dolichandrone falcata</i> Seem.	Bignoniaceae	10	LC
28.	<i>Fernandoa adenophylla</i> (Wall. ex G.Don) Steenis	Bignoniaceae	54	LC
29.	<i>Kigelia africana</i> (Lam.) Benth.	Bignoniaceae	18	LC
30.	<i>Markhamia lutea</i> (Benth.) K. Schum.	Bignoniaceae	11	LC
31.	<i>Millingtonia hortensis</i> L.f.	Bignoniaceae	1	LC
32.	<i>Oroxylum indicum</i> (L.) Benth. ex Kurz	Bignoniaceae	26	LC
33.	<i>Spathodea campanulata</i> P. Beauv.	Bignoniaceae	15	LC
34.	<i>Stereospermum chelonoides</i> (L.f.) DC.	Bignoniaceae	39	LC
35.	<i>Tecoma stans</i> (L.) Juss. ex Kunth	Bignoniaceae	55	LC
36.	<i>Cordia dichotoma</i> G.Forst.	Boraginaceae	17	LC
37.	<i>Ehretia acuminata</i> R.Br.	Boraginaceae	1	LC
38.	<i>Crateva adansonii</i> DC. subsp. odora (Buch.–Ham.) Jacobs	Capparaceae	9	LC
39.	<i>Casuarina equisetifolia</i> L.	Casuarinaceae	4	LC
40.	<i>Conocarpus erectus</i> L.	Combretaceae	2	LC
41.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	227	LC
42.	<i>Terminalia chebula</i> Retz.	Combretaceae	38	LC

43.	<i>Terminalia elliptica</i> Roxb.	Combretaceae	4	LC
44.	<i>Terminalia pendula</i> (Edgew.) Gere & Boatwr.	Combretaceae	154	LC
45.	<i>Jatropha curcas</i> L.	Euphorbiaceae	19	LC
46.	<i>Mallotus nudiflorus</i> (L.) Kulju & Welzen	Euphorbiaceae	1	LC
47.	<i>Acacia auriculiformis</i> A.Cunn. ex Benth.	Fabaceae	24	LC
48.	<i>Albizia lebbeck</i> (L.) Benth.	Fabaceae	117	LC
49.	<i>Albizia odoratissima</i> (L.f.) Benth.	Fabaceae	16	LC
50.	<i>Bauhinia purpurea</i> L.	Fabaceae	28	LC
51.	<i>Bauhinia racemosa</i> L.	Fabaceae	25	LC
52.	<i>Bauhinia variegata</i> L.	Fabaceae	4	LC
53.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	13	LC
54.	<i>Cassia fistula</i> L.	Fabaceae	28	LC
55.	<i>Cassia javanica</i> L.	Fabaceae	1	LC
56.	<i>Dalbergia lanceolaria</i> subsp. paniculata (Roxb.) Thoth.	Fabaceae	15	LC
57.	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	134	LC
58.	<i>Delonix regia</i> (Bojer ex Hook.) Raf.	Fabaceae	8	LC
59.	<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Fabaceae	2	LC
60.	<i>Hardwickia binata</i> Roxb.	Fabaceae	208	LC
61.	<i>Neltuma juliflora</i> (Sw.) Raf.	Fabaceae	6	LC
62.	<i>Ougeinia oojeinensis</i> (Roxb.) Hochr.	Fabaceae	12	LC
63.	<i>Peltophorum pterocarpum</i> (DC.) Backer ex K.Heyne	Fabaceae	5	LC
64.	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Fabaceae	54	LC
65.	<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	83	LC
66.	<i>Prosopis cineraria</i> (L.) Druce	Fabaceae	5	LC
67.	<i>Senegalia catechu</i> (L.f.) P.J.H.Hurter & Mabb.	Fabaceae	47	LC
68.	<i>Senegalia polyacantha</i> (Willd.) Seigler & Ebinger	Fabaceae	45	LC
69.	<i>Senegalia senegal</i> (L.) Britton	Fabaceae	2	LC
70.	<i>Senna siamea</i> (Lam.) H.S.Irwin & Barneby	Fabaceae	55	LC
71.	<i>Tamarindus indica</i> L.	Fabaceae	3	LC
72.	<i>Vachellia nilotica</i> (L.) P.J.H.Hurter & Mabb.	Fabaceae	6	LC
73.	<i>Vachellia tortilis</i> (Forssk.) Galasso & Banfi	Fabaceae	8	LC
74.	<i>Gmelina arborea</i> Roxb.	Lamiaceae	199	LC

75.	<i>Premna serratifolia</i> L.	Lamiaceae	1	LC
76.	<i>Vitex negundo</i> L.	Lamiaceae	6	LC
77.	<i>Vitex trifolia</i> L.	Lamiaceae	3	LC
78.	<i>Cinnamomum camphora</i> (L.) J. Presl	Lauraceae	6	LC
79.	<i>Litsea glutinosa</i> (Lour.) C. B. Rob.	Lauraceae	1	LC
80.	<i>Strychnos nux-vomica</i> L.	Loganiaceae	9	LC
81.	<i>Lagerstroemia speciosa</i> (L.) Pers. Kurz	Lythraceae	5	LC
82.	<i>Adansonia digitata</i> L.	Malvaceae	1	LC
83.	<i>Bombax ceiba</i> L.	Malvaceae	67	LC
84.	<i>Ceiba pentandra</i> (L.) Gaertn.	Malvaceae	26	LC
85.	<i>Firmiana colorata</i> (Roxb.) R.Br.	Malvaceae	1	LC
86.	<i>Grewia optiva</i> J.R.Drumm. ex Burret	Malvaceae	31	LC
87.	<i>Guazuma ulmifolia</i> Lam.	Malvaceae	6	LC
88.	<i>Helicteres isora</i> L.	Malvaceae	1	LC
89.	<i>Kydia calycina</i> Roxb.	Malvaceae	3	LC
90.	<i>Pterospermum acerifolium</i> (L.) Willd.	Malvaceae	19	LC
91.	<i>Sterculia foetida</i> L.	Malvaceae	9	LC
92.	<i>Sterculia urens</i> Roxb.	Malvaceae	79	LC
93.	<i>Thespesia populnea</i> (L.) Sol. Ex Corrêa	Malvaceae	24	LC
94.	<i>Azadirachta indica</i> A. Juss.	Meliaceae	350	LC
95.	<i>Melia dubia</i> Cav.	Meliaceae	18	LC
96.	<i>Soymdia febrifuga</i> (Roxb.) A.Juss.	Meliaceae	20	LC
97.	<i>Toona ciliata</i> M. Roem.	Meliaceae	3	LC
98.	<i>Broussonetia papyrifera</i> (L.) L'Hér. ex Vent.	Moraceae	1	LC
99.	<i>Ficus benghalensis</i> L.	Moraceae	2	LC
100.	<i>Ficus benjamina</i> L.	Moraceae	27	LC
101.	<i>Ficus carica</i> L.	Moraceae	4	LC
102.	<i>Ficus palmata</i> subsp. <i>virgata</i> Browicz	Moraceae	2	LC
103.	<i>Ficus racemosa</i> L.	Moraceae	18	LC
104.	<i>Ficus religiosa</i> L.	Moraceae	16	LC
105.	<i>Ficus virens</i> Aiton	Moraceae	37	LC
106.	<i>Morus alba</i> L.	Moraceae	23	LC
107.	<i>Moringa concanensis</i> Nimmo ex Dalzell & A.Gibson	Moringaceae	10	LC
108.	<i>Corymbia torelliana</i> (F. Muell.) K.D.Hill & L.A.S.Johnson	Myrtaceae	5	LC

109.	<i>Melaleuca viminalis</i> (Sol. ex Gaertn.) Byrnes	Myrtaceae	22	LC
110.	<i>Psidium guajava</i> L.	Myrtaceae	75	LC
111.	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	80	LC
112.	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	2	LC
113.	<i>Bridelia retusa</i> (L.) A.Juss.	Phyllanthaceae	38	LC
114.	<i>Bridelia verrucosa</i> Haines	Phyllanthaceae	9	LC
115.	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	12	LC
116.	<i>Putranjiva roxburghii</i> Wall.	Putranjivaceae	56	LC
117.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	40	LC
118.	<i>Adina cordifolia</i> (Roxb.) Brandis	Rubiaceae	18	LC
119.	<i>Gardenia latifolia</i> Aiton	Rubiaceae	34	LC
120.	<i>Mitragyna parvifolia</i> (Roxb.) Korth	Rubiaceae	70	LC
121.	<i>Bergera koenigii</i> L.	Rutaceae	13	LC
122.	<i>Citrus</i> × <i>aurantium</i> L.	Rutaceae	2	LC
123.	<i>Citrus</i> × <i>taitensis</i> Risso	Rutaceae	2	LC
124.	<i>Citrus limon</i> L.	Rutaceae	3	LC
125.	<i>Citrus maxima</i> (Burm.) Merr.	Rutaceae	2	LC
126.	<i>Citrus medica</i> L.	Rutaceae	6	LC
127.	<i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	2	LC
128.	<i>Murraya paniculata</i> (L.) Jack	Rutaceae	71	LC
129.	<i>Salvadora persica</i> L.	Salvadoraceae	2	LC
130.	<i>Sapindus mukorossi</i> Gaertn.	Sapindaceae	23	LC
131.	<i>Schleichera oleosa</i> (Lour.) oken.	Sapindaceae	4	LC
132.	<i>Madhuca neriifolia</i> (Moon) H.J.Lam	Sapotaceae	26	LC
133.	<i>Manilkara hexandra</i> (Roxb.) Dubard	Sapotaceae	21	LC
134.	<i>Mimusops elengi</i> L.	Sapotaceae	52	LC
135.	<i>Simarouba glauca</i> DC.	Simaroubaceae	3	LC
136.	<i>Tamarix aphylla</i> (L.) H.Karst.	Tamaricaceae	2	LC
137.	<i>Holoptelea integrifolia</i> (Roxb.) Planch.	Ulmaceae	178	LC
138.	<i>Lannea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	68	Not Evaluated
139.	<i>Terminalia anogeissiana</i> Gere & Boatwr.	Combretaceae	1	Not Evaluated
140.	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	148	Not Evaluated
141.	<i>Elaeocarpus sphaericus</i> (Gaertn.) Heer	Elaeocarpaceae	1	Not Evaluated
142.	<i>Ricinus communis</i> L.	Euphorbiaceae	4	Not Evaluated
143.	<i>Calliandra haematocephala</i> Hassk.	Fabaceae	2	Not Evaluated
144.	<i>Colophospermum mopane</i> (J.Kirk ex Benth.)	Fabaceae	5	Not Evaluated

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145.	<i>Indopiptadenia oudhensis</i> (Brandis) Brenan	Fabaceae	3	Not Evaluated
146.	<i>Leucaena leucocephala</i> (Lam.) de Wit	Fabaceae	190	Not Evaluated
147.	<i>Phanera roxburghiana</i> (Voigt) Bandyop., Anand Kumar & Chakrab.	Fabaceae	7	Not Evaluated
148.	<i>Senegalia rugata</i> (Lam.) Britton & Rose	Fabaceae	2	Not Evaluated
149.	<i>Senna suratensis</i> (Burm.f.) H.S. Irwin & Barneby	Fabaceae	4	Not Evaluated
150.	<i>Careya arborea</i> Roxb.	Lecythidaceae	16	Not Evaluated
151.	<i>Planchonia andamanica</i> King	Lecythidaceae	1	Not Evaluated
152.	<i>Punica granatum</i> L.	Lythraceae	33	Not Evaluated
153.	<i>Moringa oleifera</i> Lam.	Moringaceae	22	Not Evaluated
154.	<i>Eucalyptus globules</i> Labill.	Myrtaceae	3	Not Evaluated
155.	<i>Melaleuca lanceolata</i> Otto	Myrtaceae	8	Not Evaluated
156.	<i>Psidium cattleianum</i> Hodel.	Myrtaceae	4	Not Evaluated
157.	<i>Phyllanthus acidus</i> (L.) Skeels	Phyllanthaceae	7	Not Evaluated
158.	<i>Malus domestica</i> (Suckow) Borkh.	Rosaceae	3	Not Evaluated
159.	<i>Morinda pubescens</i> J. E. Sm.	Rubiaceae	2	Not Evaluated
160.	<i>Neolamarckia cadamba</i> (Roxb.) Bosser	Rubiaceae	2	Not Evaluated
161.	<i>Citrus reticulata</i> Blanco	Rutaceae	10	Not Evaluated
162.	<i>Limonia acidissima</i> L.	Rutaceae	13	Not Evaluated
163.	<i>Sapindus emarginatus</i> Vahl.	Sapindaceae	11	Not Evaluated
164.	<i>Diploknema butyracea</i> (Roxb.) H.J. Lam	Sapotaceae	6	Not Evaluated
165.	<i>Madhuca longifolia</i> var. <i>latifolia</i> (J.Konig) J.F.Macbr.	Sapotaceae	89	Not Evaluated
166.	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	19	NT A2acd
167.	<i>Swietenia mahagoni</i> (L.) Jacq.	Meliaceae	8	NT A2cd
168.	<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	32	NT C1
169.	<i>Dalbergia latifolia</i> Roxb.	Fabaceae	60	VU A1cd.
170.	<i>Cleistanthus collinus</i> (Roxb.) Benth. ex Hook.f.	Phyllanthaceae	7	VU A1d
171.	<i>Jacaranda mimosifolia</i> D.Don	Bignoniaceae	3	VU A2cd
172.	<i>Pterocarpus dalbergioides</i> Roxb. ex DC.	Fabaceae	26	VU A2d
173.	<i>Santalum album</i> L.	Santalaceae	8	VU A2de
174.	<i>Saraca asoca</i> (Roxb.) Wilde	Fabaceae	1	VU B1+2c
175.	<i>Pterospermum reticulatum</i> Wight & Arn.	Malvaceae	13	VU B1+2c

	Total number of plants	5011	
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4. Discussion

According to Global Tree Portal (2025) out of world's c. 60,000 tree species, 17,756 species (approx. 30.8 %) are globally threatened. Total 2,584 tree species are native of India of which 654 tree species are endemic and 431 are globally threatened. As per the in the IUCN Red List of Threatened Species (version 3.1), Botanic Garden of Indian Republic (BGIR), Noida conserves 143 taxa from which Critically Endangered (CR) taxa are *Commiphora wightii* (Arn.) Bhandari (Oldfield & al., 1998; CAMP Workshops on Medicinal Plants, India, 1998) and *Hildegardia populifolia* (Roxb.) Schott & Endl. The two 2 Endangered (EN) taxa are *Tecomella undulata* D.Don (Plummer, 2021) and *Tectona grandis* L.f. (Gua et al., 2022). The seven Vulnerable (VU) taxa are *Dalbergia latifolia* Roxb. (Lakhey, 2020), *Cleistanthus collinus* (Roxb.) Benth. ex Hook.f., *Jacaranda mimosifolia* D.Don (Hills, 2020), *Pterocarpus dalbergioides* Roxb. ex DC. (Barstow, 2018), *Santalum album* L. (Arunkumar & al., 2019), *Saraca asoca* (Roxb.) Wilde (CAMP, 1998) and *Pterospermum reticulatum* Wight & Arn. (WCMC, 1998). The three Near Threatened (NT) taxa are *Aegle marmelos* (L.) Correa (Plummer, 2020), *Swietenia mahagoni* (L.) Jacq. (Bahamas, 2018; Barstow, 2020) and *Pterocarpus marsupium* Roxb. (Barstow, 2017). Total 127 tree species are Least Concerned (LC), 6 species are Data Deficient (DD), 28 species are not evaluated.

5. Conclusion

The present study underscores the biodiversity conserved within the Botanic Garden of Indian Republic (BGIR) Noida, documenting 175 angiosperm tree taxa across 38 families, comprising both native and exotic species. With over 5,011 individual trees representing 133 genera, the garden plays an integral role in preserving a wide variety of plant species. The dominant families, including Fabaceae, Malvaceae, Bignoniaceae, Rutaceae, and Moraceae, reflect the garden's diverse collection of tree taxa, distributed across various forest zones and plant sections. In addition, the garden makes a significant contribution to global conservation efforts by protecting 143 taxa listed in the IUCN Red List of Threatened Species, including species that are near threatened, vulnerable, endangered or critically endangered. Through this

initiative, these taxa are thriving in a safe environment, supporting the preservation of both common and endangered species. The successful management of these trees highlights the vital role of Botanic Garden of Indian Republic (BGIR) Noida in biodiversity conservation, ensuring the continued survival of plant life in the face of challenges such as habitat loss and climate change.

Competing Interests Disclaimer

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

References

- Arunkumar, A.N., Dhyani, A. & Joshi, G. 2019. *Santalum album*. The IUCN Red List of Threatened Species 2019: e.T31852A2807668.
- Bahamas GTA Workshop 2018 and Barstow, M. 2020. *Swietenia mahagoni*. The IUCN Red List of Threatened Species 2020: e.T32519A68104916.
- Barstow, M. 2017. *Pterocarpus marsupium*. The IUCN Red List of Threatened Species 2017: e.T34620A67802995.
- Barstow, M. 2018. *Pterocarpus dalbergioides*. The IUCN Red List of Threatened Species 2018: e.T33261A67802958.
- CAMP Workshops on Medicinal Plants, India (January 1997). 1998. *Saraca asoca*. The IUCN Red List of Threatened Species 1998: e.T34623A9879360.

- Chen G, Sun W. 2018. The role of botanical gardens in scientific research, conservation, and citizen science. *Plant Diversity* 40: 181–188.
- Donaldson J.S. 2009. Botanic gardens science for conservation and global change. *Trends in Plant Science* 14: 608–613.
- Gua, B., Pedersen, A. & Barstow, M. 2022. *Tectona grandis*. The IUCN Red List of Threatened Species 2022: e.T62019830A62019832.
- Hills, R. 2020. *Jacaranda mimosifolia*. The IUCN Red List of Threatened Species 2020: e.T32027A68135641.
- Lakhey, P., Pathak, J. & Adhikari, B. 2020. *Dalbergia latifolia*. The IUCN Red List of Threatened Species 2020: e.T32098A67777757.
- Maunder, M., Higgs, S. and Culham, A. 2001. The effectiveness of botanic garden collections in supporting plant conservation: a European case study. *Biodivers. Conserv.* 10: 383e401.
- Oldfield, S., Lusty, C. and MacKinven, A. 1998. The World List of Threatened Trees. World Conservation Press, Cambridge, UK.
- Plummer, J. 2020. *Aegle marmelos*. The IUCN Red List of Threatened Species 2020: e.T156233789A156238207.
- Plummer, J. 2021. *Tecomella undulata*. The IUCN Red List of Threatened Species 2021: e.T137731325A169300279.
- Richard B. Primack, Elizabeth R. Ellwood, Amanda S. Gallinat and Abraham J. Miller-Rushing. 2021. The growing and vital role of botanical gardens in climate change research. *New Phytologist* 231: 917–932.
- Sellmann D, Bogner F.X. 2013. Climate change education: quantitatively assessing the impact of a botanical garden as an informal learning environment. *Environmental Education Research* 19: 415–429.

- Ved, D., Saha, D., Ravikumar, K. & Haridasan, K. 2015. *Commiphora wightii*. The IUCN Red List of Threatened Species 2015: e.T31231A50131117. Accessed on 20 March 2025.
- Ved, D., Saha, D., Ravikumar, K. and Haridasan, K. 2015. *Commiphora wightii*. The IUCN Red World Conservation Monitoring Centre. 1998. *Pterospermum reticulatum*. The IUCN Red List of Threatened Species 1998: e.T31172A9610738.
- Heywood, V. H. 2017. Botanic gardens as centres for science, education and conservation. BGjournal, 14(1): 3-6.
- Mounce, R., Smith, P., & Brockington, S. 2017. Ex situ conservation of plant diversity in the world's botanic gardens. Nature Plants, 3(10): 795-802.
- Wyse Jackson, P., & Sutherland, L. A. 2000. International Agenda for Botanic Gardens in Conservation. Botanic Gardens Conservation International (BGCI).

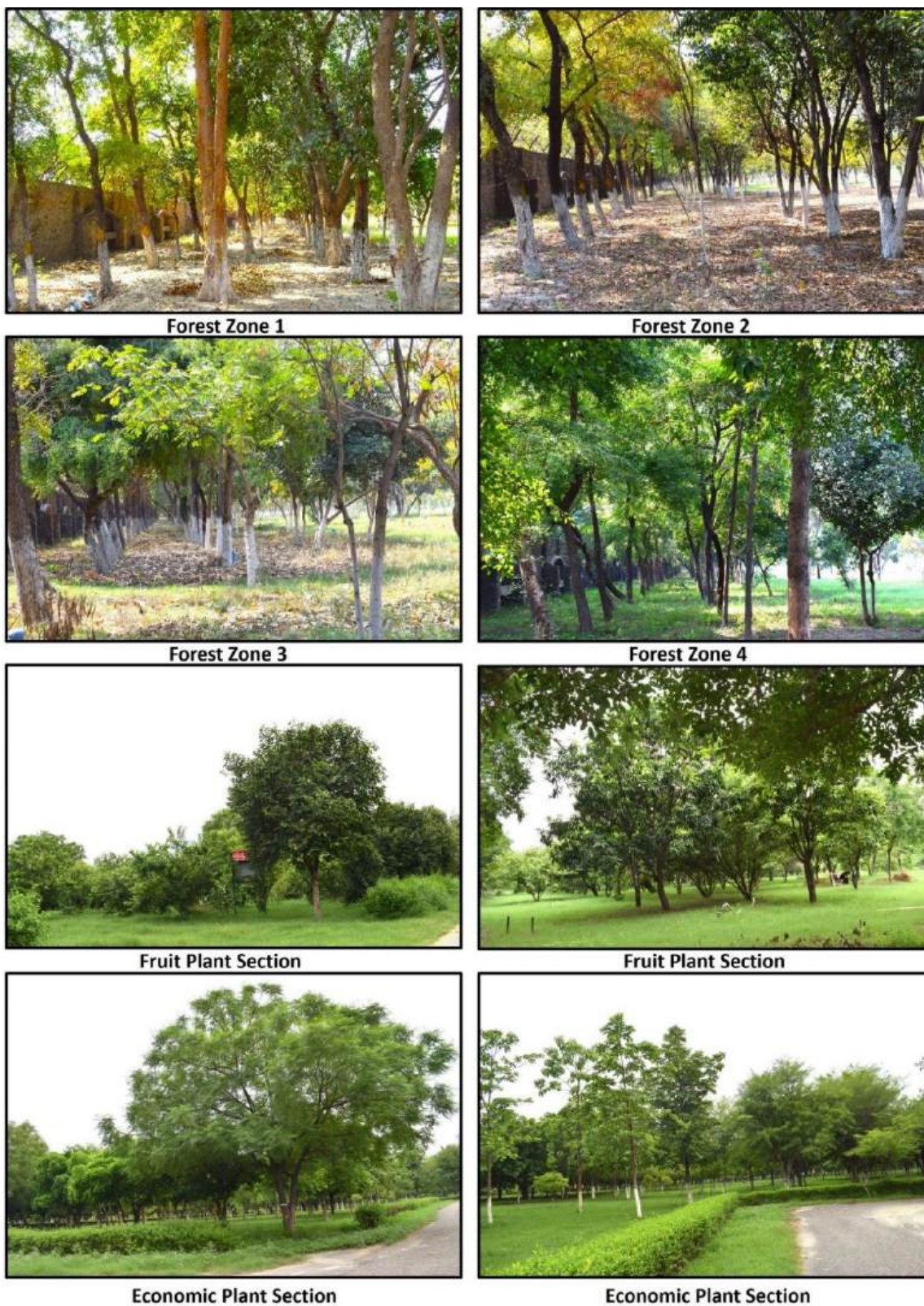


Figure 6. Different Zones/Sections of Botanic Garden of Indian Republic (BGIR), Noida