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Assessing urban plant diversity: A case study at the open university of Sri Lanka

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Key words: University, Urbanized area, Plant diversity, Flora

Abstract

This study explores the diversity of flowering trees within the Nawala premises of the Open University of Sri Lanka (OUSL). Situated in a highly urbanized area with a landfill marsh, the OUSL spans 133,216.3 m² and includes a variety of landscapes such as internal roads, buildings, lawns, gardens, and forested regions. Employing a multifaceted research approach, the study integrates both primary and secondary data collection methods. Primary data was obtained through extensive surveys conducted across various zones of university, focusing on the identification and classification of plant species using taxonomic keys. Additionally, consultations with university experts provided valuable historical insights into changes in plant diversity and their environmental implications over time. The study identified a total of 1,247 plants across six zones, revealing 156 species from 75 genera and 44 families. This included 6 endemics, 111 indigenous, and 39 exotic species. The Fabaceae family was the most represented, with 21 species, followed by Myrtaceae with 15 and Rubiaceae with 9. Notably, *Mangifera indica* was the most abundant species, with 92 individuals recorded. Data analysis using the Shannon diversity index yielded values of 4.40 for OUSL and 4.03 for zone D. These results demonstrate that OUSL supports significant plant diversity despite its urban context, positively contributing to environmental sustainability. The study advocates for enhanced conservation efforts and the promotion of native species to further bolster environmental friendliness, underscoring the role of educational institutions in advancing urban biodiversity conservation and sustainable practices.

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Introduction

The Open University of Sri Lanka (OUSL) stands as a cornerstone of distance education in Sri Lanka, established in 1980 to address the educational needs of diverse learner demographics (OUSL, n.d.). The Nawala premises of OUSL is situated in the Colombo District, Sri Lanka's low country wet zone. The coordinate of the location is Latitude: 6.9315° N and Longitude: 79.9585° E (Google Maps).

Nawala premises of the Open University of Sri Lanka (OUSL) was developed on a site that was previously a marshy land. This location was characterized by its low-lying terrain and suffered from polluted water runoff. The area experienced flooding due to high water levels from the "Diyawanna Oya" (Kotte Canal or Kirulapane Canal), a man-made waterway constructed during the colonial era (Madurapperuma and Kuruppuarachchi, 2016). The Fig. 1 shows the map of the Nawala premises of the OUSL and its surrounding areas.

During the rainy season, the study area is frequently inundated with canal water due to elevated water levels. Conversely, during short dry spells, typically from February to early April, the site experiences rapid drying. The soil in this area is classified as bog and half-bog, characterized by high pH, low organic carbon content, and high moisture levels, leading to significant fluctuations in water retention capacity. Additionally, certain gaseous and metallic constituents present in the soil inhibit plant growth, further impacting the site's ecological dynamics (Madurapperuma and Kuruppuarachchi, 2016).

Fig. 1. Map of the OUSL Nawala premises (Source: https://sustainability.ou.ac.lk/settings/)

Landscape management initiatives at the Open University of Sri Lanka (OUSL) included tree-planting programs implemented in 1984, 1990, 2000, and 2008 (Madurapperuma and Kuruppuarachchi, 2016). Furthermore, there were several Tree Planting programs conducted time to time up to recent past. The university lands were routinely maintained by the Landscape division in order to maintain aesthetic beauty and safety of the employees and students and building structures of the university.

Universities are traditionally viewed as centers of intellectual pursuit, churning out future leaders and innovators (Purcell *et al.*, 2019). However, the conversation surrounding their role in environmental sustainability is gaining momentum. One often-overlooked aspect of this role is the critical importance of university biodiversity (Center for biodiversity outcomes, 2024). This research paper delves into the multifaceted impact that fostering biodiversity

within university grounds has on environmental friendliness.

Universities with diverse ecosystems can act as living laboratories for environmental research. The presence of a variety of plant and animal life provides a platform for faculty and students to conduct firsthand studies in ecology, conservation biology, and sustainable practices (Nyahongo, 2022). These studies are not merely theoretical exercises. They generate valuable data and solutions for real-world environmental challenges faced by local communities and beyond (University and sustainability: the role of students in caring for the planet, 2023). For example, research conducted on campus pollinator populations can inform local agricultural practices, benefiting both the university and surrounding areas (Baldos *et al.*, 2015).

Fostering biodiversity within universities fosters a culture of environmental awareness and responsibility. By integrating natural spaces like gardens, forests, or wetlands into their infrastructure, universities create opportunities for students to engage with nature beyond textbooks (Cohen, 2019). This engagement can occur through coursework, field studies, or even casual exploration of these spaces (Basile *et al.*, 2023). This interaction fosters an appreciation for the delicate balance of ecosystems and motivates students to adopt environmentally conscious practices not only on campus but also in their future careers (Evans, 2018).

Sri Lanka's lands are categorized based on its climatic zones: the wet zone, the dry zone, and the intermediate zone. The wet zone itself is further divided into three subcategories as low country wet zone, mid zone wet zone and upcountry wet zones (Gunawardena and Jayasinghe, 2002). The low country wet zone encompasses areas up to 300 meters above sea level and receives over 2,000 mm of rainfall annually. This region experiences heavy rains during the southwest monsoon period from May to September. Despite this, February and August are relatively drier months. The average annual temperature in the wet zone is around 27 degrees Celsius, with consistent sunlight throughout the year (Punyawardena, 2008). The combination of high temperatures and abundant rainfall creates ideal conditions for plant growth.

Universities are increasingly recognizing their role in promoting environmental sustainability (Purcell *et al.*, 2019). Beyond traditional approaches like energy conservation and waste reduction, a growing area of interest lies in the fostering of biodiversity within university grounds (Colding and Barthel, 2017) Universities can be considered as Living Laboratories with diverse ecosystems offer unique learning opportunities. Studies by Nyahongo (2022) and Basile *et al.* (2023) highlight the value of these "living laboratories" for research in ecology, conservation biology, and sustainable practices. The presence of a variety of plants and animals allows faculty and students to conduct firsthand studies, generating valuable data with direct application to local and global environmental challenges (University and sustainability: the role of students in caring for the planet, 2023). For instance, research on campus pollinator populations can inform local agricultural practices, benefiting both the university and surrounding areas (Baldos *et al.*, 2015).

As emphasizes by Evans (2018), the importance of environmental education for sustainability, and universities can achieve through university green spaces. Studies by Basile *et al.* (2023) demonstrates that engagement with these spaces, whether through coursework, field studies, or even casual exploration, leads to a deeper appreciation for ecosystems. This fosters environmentally conscious behaviors not only on university but also in future careers (Cohen, 2019).

University biodiversity contributes significantly to the surrounding environment and Enhancing Environmental Health. It is highlighted by Pataki *et al.* (2011) that the role of well-maintained university

ecosystems as natural filters, improving air quality by absorbing pollutants.

Additionally, Miller (2009) discusses the importance of urban biodiversity in fostering healthy and resilient environments. Also research on integrating biodiversity into university design and construction can inform the creation of more sustainable universities (Aronson *et al.,* 2017).

From fostering research and environmental awareness to enhancing urban ecosystems, the benefits are multifaceted. By addressing the challenges and continuing to develop innovative approaches, universities can leverage their biodiversity to become leaders in environmental sustainability.

The study aims to identify the total number of plant species at OUSL, evaluate the proportions of endemic, indigenous, and exotic plants, and analyze the distribution of plant families throughout the university. Additionally, the study seeks to promote tree planting in urban areas, including educational institutions like universities.

Materials and methods

The research was carried out in Nawala premises of OUSL by dividing the master ground plan into six blocks as A, B, C, D, E and F according to landscape maintenance plan. This research employed a descriptive and observational research design to assess the impact of university plant diversity on environmental friendliness. The flowering plants with a height of more than one meter were taken into the study. The data was collected from April 2024 to June 2024.

Interviews were conducted with experienced university employees for identification and for history of plants. For the identification used the available information on campus flora, including notice boards, name boards and existing records, was reviewed to complement the observational data. Plant species were identified using field guide (Vlas de, 2008) and taxonomic keys.

The number of plants in each species was counted in each block separately. The collected data on the above plant was tabulated in Microsoft Excel package with species, common name, family, status. The abundance of species and families were extracted from the data set. The collected data were analyzed to determine species diversity by using The Shannon Index or Shonnon information index with following equation (Magurran, 1988).

$H = -\Sigma pi * \ln(pi)$

Where,

Σ: A Greek symbol that means "sum"

ln: Natural log

pi: The proportion of the entire community made up of species i

Results and discussion

The total land area of the Nawala premises is 133,216.3 m2 and the vegetation of the land and its area are shown in the Fig. 2. Total area distribution of land usage can be categorized as grassed lawns, Gardens, forested areas and internal planting or courtyards. In this study investigated the diversity of flowering trees. The distribution of vegetation can be categorized as mature trees, landscaped gardens, and pockets of natural vegetation. This aligns with the findings of Evans (2018) who emphasizes the importance of green spaces within universities.

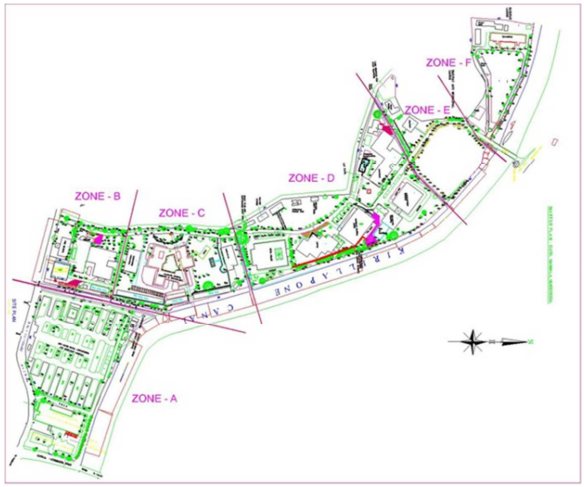

Fig. 2. The map of the six zones of Nawala premises the open university of Sri Lanka

Table 1. List of plant of the open university of Sri Lanka

#	Scientific name	Sinhala name	English name	Family	Status	Count
1	*Artocarpus altilis*	Dell	Breadfruit	Moraceae	Exotic	4
2	*Acacia auriculiformis*	Acacia	Earpod wattle or Ear-leaf Acacia	Fabaceae	Exotic	20
3	*Areca catechu*	Puwak	Areca nut	Palmae	Indigenous	4
4	*Araucaria columnaris*	Araucaria	Cooks pine	Araucariaceae	Exotic	1
5	*Artocarpus heterophyllus*	Kos	Jack fruit	Moraceae	Indigenous	28
6	*Azadirachta indica*	Kohomba	Neem,Margosa	Meliaceae	Indigenous	9
7	*Albizia lebbeck*	Albizia	Lebbek	Fabaceae	Exotic	2
8	*Aegle marmelos*	Belly	Golden apple	Rutaceae	Indigenous	1
9	*Amherstia nobilis*	Amherstia	Queen of Flowering Trees	Caesalpiniaceae	Exotic	1
10	*Anacardium occidentale*	Kaju	Cashew nut	Anacardiaceae	Indigenous	1
11	*Adenathera pavonina*	Maditiya	Red Lucky Seed	Fabaceae	Indigenous	12
12	*Annona muricata*	Katu anoda	Prickly Custard Apple	Annonaceae	Indigenous	3
13	*Annona reticulata*	Veli Anoda	Custard apple	Annonaceae	Exotic	4
14	*Alstonia scholaris*	Gas rukaththana	Devil tree	Apocynaceae	Indigenous	1
15	*Azedara speciosa*	Lunumidella	Chinaberry tree	Meliaceae	Indigenous	1
16	*Barringtonia asiatica*	Diya-midella	Sea poison tree	Lecythidaceae	Indigenous	7
17	*Bauhinia acuminata*	Kobo-leela	Dwarf white orchid tree	Caeselpiniaceae	Indigenous	5
18	*Bauhinia purpurea*	Koboleela	Purple orchid	Caeselpiniaceae	Indigenous	12
19	*Buchanania axillaris*	Kiri palu	Cuddapah Almond	Anacardiaceae	Indigenous	1
20	*Bauhinia variegata*	Koboleela	orchid tree, mountain-ebony	Caeselpiniaceae	Indigenous	5
21	*Barringtonia racemosa*	Goda midella	powder-puff tree	Lecythidaceae	Indigenous	4
22	*Bridelia retusa*	Ketakala	Spinous kino tree	Phyllanthaceae	Indigenous	4
23	*Borassus flabellifer*	Thal	Palmyra Palmyrah Palm	Arecaceae	Indigenous	4
24	*Cassia auriculata*	Ranawara	Avaram senna	Fabaceae	Indigenous	5
25	*Citrus aurantifolia*	Dehi	True lime	Rutaceae	Indigenous	6
26	*Cassia bacillaris*	-	white bark senna.	Fabaceae	Indigenous	2
27	*Carallia brachiata*	Dawata	senna	Rhizophoraceae	Exotic	2
28	*Carissa carandas*	Mahakaraba	Jamson	Apocynaceae	Exotic	1
29	*Callistemon citrinus*	bottlebrushes	bottlebrushes	Myrtaceae	Exotic	1
30	*Cynometra cauliflora*	Nam nam	Num Num	Fabaceae	Exotic	3
31	*Casuarina equisetifolia*		Beef wood	Caesalpiniaceae	Indigenous	8
32	*Cassia fistula*	Ehela	Golden shower	Caesalpiniaceae	Indigenous	40
33	*Calotropis gigantea*	Wara	crown flower	Apocynaceae	Indigenous	3
34	*Citrus grandis*	Jambola	True pomelo	Rutaceae	Indigenous	2
35	*Couroupita guianensis*	Sal	Cannon Ball Tree	Lecythidaceae	Exotic	1
36	*Calophyllum inophyllum*	Doba	Ball tree	Calophyllaceae	Indigenous	1
37	*Cerbera manghas*	Kaduru	Sea mango	Apocynaceae	Indigenous	7
38	*Calamus monoecus*	Wewel	Cane	Arecaeae	Indigenous	1
39	*Cocous nucifera*	Poll	Coconut palm	Palmae	Indigenous	48
40	*Cleistocalyx nervosum*	Bata damba	-	Myrtaceae	Indigenous	1
41	*Cerbera odollam*	Gon Kaduru	Suicid tree (T- Nangi-ma)	Apocynaceae	Indigenous	11
42	*Caesalpinia pulcherrima*	Monara Mal	peacock flower	Fabaceae,	Indigenous	5
43	*Citrus reticulata*	Naran	Mandarin	Rutaceae	Indigenous	20
44	*Chloroxylon switenia*	Burutha	Stain wood	Fabacea	Indigenous	2
45	*Cupressus sempervirens*	Cypress	Mediterranean cypress	Cupressaceae	Exotic	9
46	*Citrus sinensis*	Dodam	Orange	Rutaceae	Indigenous	1
47	*Chukrasia tabularis*	Hulan hik	Chittagong wood	Meliaceae	Indigenous	1
48	*Caryota urenus*	Kitul	Kitul palm, Fishtail palm	Palmae	Indigenous	7
49	*Cycas zeylanica*	Madu	Cycas	Cycadaceae	Indigenous	1
50	*Diospyros ebenum*	Kaluvara	Ebony	Ebenaceae	Indigenous	1
51	*Dracaena fragrans*	Fortune Plant		Asparagaceae	Exotic	5
52	*Dypsis lutescens*	Cane palm	Cane palm	Arecaceae	Exotic	7
53	*Delonix regia*	May mara	Flame tree	Caeselpiniaceae	Indigenous	6
54	*Dillenia retusa*	Godapara		Dilleniaceae	Indigenous	6
55	*Dracaena reflexa*	Dracaena	Pleomela- song of India	Asparagaceae	Exotic	8
56	*Dillenia suffruticosa*	Para	Shrubby dillenia	Dilleniaceae	Exotic	1
57	*Dendrolobium umbellatum*	Kaha Karanda		Fabaceae	Exotic	9
58	*Dipterocarpus zeylanicus*	Hora	Hora	Dipterocarpaceae	Endemic	5
59	*Erythrina fusca*	Yak-erabadu	coral bean	Fabaceae	Indigenous	3
60	*Elaeis guineensis*	Katu Pol	Bushweed	Arecaceae	Indigenous	6

61	*Embelia ribes*	Embilla	False Black Pepper	Primulaceae	Indigenous	5
62	*Elaeocarpus serratus*	Weralu	Wild olive	Elaeocarpaceae	Indigenous	22
63	*Euphorbia tirucalli*	Gass Nawahandi	Milk hedge	Euphorbiaceae	Indigenous	1
64	*Eucalyptus robusta*	Eucalyptus	Samp Mahogany	Myrtaceae	Exotic	2
65	*Eugenia uniflora*	Cheri		Myrtaceae	Exotic	3
66	*Ficus bengamina*	Nuge	Weeping fig	Moraceae	Exotic	42
67	*Ficus benghalensis*	Maha nuga	Banyan	Moraceae	Indigenous	10
68	*Filicium decepiums*	Pihimbiya	Fernleaf tree	Sapindaceae	Indigenous	53
69	*Flacourtia indica*	Uguressa	governor's plum	Saliaceae	Indigenous	2
70	*Flueggea leucopyrus*	Katupila		Phyllanthaceae	Indigenous	1
71	*Ficus microcarpa*	-	Chinese banyan	Moraceae	Exotic	2
72	*Ficus racemosa*	Attikka	Cluster fig	Moraceae	Indigenous	30
73	*Ficus religiosa*	Bo	Sacred fig	Moraceae	Indigenous	4
74	*Glycosmis pentaphylla*	Dodam pana	Gin Berry	Rutaceae	Indigenous	1
75	*Granatum punicum*	Delum	Pomegranate Tree	Lythraceae	Indigenous	4
76	*Gliricidia sepium*	Gliricidia	Quickstick	Fabaceae	Indigenous	23
77	*Helicteres isora*	Liniya		Malavaceae	Indigenous	2
78	*Ixora coccinea*	Rat mal	Jungle flame	Rubiaceae	Indigenous	18
79	*Jacaranda mimosifolia*	Jacaranda	Blue Jacaranda	Bignoniaceae	Exotic	3
80	*Limonia acidissima*	Divul	Wood apple	Rutaceae	Indigenous	3
81	*Lannea coromandelica*	Hik	Indian ash tree	Anacardiaceae	Indigenous	3
82	*Litsea glutinosa*	BoMe	Bolly beach tree	Lauraceae	Indigenous	1
83	*Litsea iteodaphne*	Kalu nika		Lauraceae	Endemic	1
84	*Leucaena leucocephala*	Ipil ipil	Ipil ipil	Fabaceae	Exotic	1
85	*Lagerstromia speciosa*	Queen's flower	Murutha	Lythraceae	Indigenous	8
86	*Melia azedarach*	Lunumidella	Chinaberry	Meliaceae	Indigenous	4
87	*Muntingia calabura*	Jam	Jam tree	Muntingiaceae	Exotic	9
88	*Morinda citrifolia*	Ahu	Indian mulberry	Rubiaceae	Indigenous	5
89	*Mimusope elengi*	Munamal	Spanish cherry	Sapotaceae	Indigenous	7
90	*Mesua ferra*	Na	Iron wood	Clusiaceae	Endemic	18
91	*Manikara hexandra*	Palu	Monesia	Sapotaceae	Indigenous	1
92	*Mangifirera indica*	Ambe	Mango	Anacardiaceae	Indigenous	92
93	*Murraya koenigii*	Karapincha	Curry leaf	Rutaceae	Indigenous	2
94	*Murraya paniculata*	Etteriya	Lime Berry	Rutaceae	Indigenous	16
95	*Madhuca longifolia*	Mee	Mousey mi	Sapotaceae	Indeginous	10
96	*Monoon longifolium*	Ovila	Green Star	Annonaceae	Exotic	10
97	*Moringa oleifera*	Murunga	Horse radish tree	Moringaceae	Indigenous	2
98	*Musa x paradisica*	Kesel	Banana, Plantain	Musaceae	Indigenous	24
99	*Macaranga peltata*	Kenda	-	Euphorbiaceae	Indigenous	16
100	*Mussaenda philippica*	Musandas	Musandas	Rubiaceae	Exotic	1
101	*Mangifera zeylanica*	Etamba	Sri Lankan Mango	Anacardiaceae	Endemic	1
102	*Manilkara zapota*	Sepadilla	Chicko	Sapotaceae	Indigenous	12
103	*Nyctanthes arbor-tristis*	Sepalika	Tree of sorrow	Oleaceae	Indigenous	1
104	*Neolitsea cassia*	Dawul Kurudu	-	Lauraceae	Endemic	3
105	*Nephelium lappaceum*	Rambutan	Rambutan	Sapindaceae	Exotic	5
106	*Nauclea orentalis*	Back mee	canary wood	Rubiaceae	Indigenous	2
107	*Persea americana*	Alipera	Avocado	Lauraceae	Indigenous	3
108	*Phyllanthus acidus*	Rata nelli	Country gooseberry	Euphorbiaceae	Indigenous	14
109	*Psidium cattleyanum*	Embul pera	Cattley guava	Myrtaceae	Exotic	5
110	*Phyllanthus embica*	Beheth nelli	Embica	Phyllantheceae	Indigenous	18
111	*Psidium guajava*	Pera	Guava	Myrtaceae	Indigenous	22
112	*Punica granatum*	Delum	Pomegranate	Lythraceae	Indigenous	7
113	*Polyalthia longifolia*	-	Ashoka	Annonaceae	Indigenous	4
114	*Pericopsis mooniana*	Nedun	Nadun Wood	Fabaceae	Indigenous	5
115	*Pterocarpus marsupium*	Gammalu	Indian Kino tree	Fabaceae	Indigenous	2
116	*Ptychosperma macarthurii*	Kantia	MacArthur Palm	Arecaceae	Exotic	2
117	*Pandanus odoratissimus*	Weta Keyiya	Screw pine	Pandanaceae	Indigenous	3
118	*Plumeria obtusa*	-	Temple flower	Apocynaceae	Indigenous	7
119	*Pongamia pinnata*	Magul karanda	Indian beech	Fabaceae	Indigenous	16
120	*Peltophorum pterocarpum*	-	Yellow flame tree	Fabaceae	Indigenous	2
121	*Plumeria rubra*	Araliya	Temple flower	Apocynaceae	Indigenous	4
122	*Ricinus communis*	Endaru	Castor	Euphorbiaceae	Indigenous	4
123	*Roystonia regia*	Royal palm	Royal palm	Areaceae	Exotic	4
124	*Santalum album*	Sudu hadun	Sandalwood	Santalaceae	Indigenous	5
125	*Saraca asoca*	Ashoka	Ashoka Tree	Fabaceae	Indigenous	3

126	*Sterculia balanghas*	Nawa	-	Malvaceae	Indigenous	1
127	*Smilax ceylanica* Oken	Kabarassa	Kumarika	Smilaceae	Indigenous	1
128	*Syzygium caryophyllatum*	Dan	-	Myrtaceae	Indigenous	6
129	*Syzygium Campanulatum*	Christina	Christina	Myrtaceae	Exotic	20
130	*Syzygium cumini*	Madan	Black Plum	Myrtaceae	Indigenous	5
131	*Syzygium embica*	Pinijambu	Wax apple	Myrtaceae	Indigenous	5
132	*Sesbania grandiflora*	Katuru murunga	Hummingbird tree	Fabaceae	Indigenous	1
133	*Syzygium jambos*	Jambu	Rose apple	Myrtaceae	Indigenous	6
134	*Swietenia macrophylla*	Mahoganie	Mahoganie	Meliaceae	Exotic	32
135	*Syzygium nervosum*	Batadamba		Myrtaceae	Indigenous	5
136	*Strychnos nuxvomica*	Kaduru/Gon Kaduru	Poison nut	Loganiaceae	Indigenous	5
137	*Schleichera oleosa*	Kon	Ceylon oak	Sapindaceae	Indigenous	7
138	*Spondias pinnata*	Wal ambarella	Hog plum	Anacardiaceae	Indigenous	4
139	*Samanea saman*	Para Mara	rain tree	Fabaceae	Exotic	1
140	*Syzygium samarangense*	Pini-jambu	Java apple	Myrtaceae	Exotic	4
141	*Syzygium zeylanicum*	Yakul maran	Spicate Eugenia	Myrtaceae	Indigenous	1
142	*Senna spectabilis*	Kaha-kona		Fabaceae	Indigenous	13
143	*Terminalia arjuna*	Kubuk	Arjun tree	Combretaceae	Indigenous	16
144	*Terminalia bellirica*	Bulu	Myrabalans	Combretaceae	Indigenous	6
145	*Terminalia catappa*	Kottamba	Indian almond	Combretaceae	Indigenous	50
146	*Terminalia chebula*	Aralu	Gall nut, Ink nut	Combretaceae	Indigenous	2
147	*Theobroma cacao*	Kokowa	Cocoa	Malvaceae	Exotic	1
148	*Tabernaemontana dichotoma*	Dvi Kaduru	Eve's apple	Apocynaceae	Endemic	1
149	*Tectona grandis*	Thekka	Teak	Verbenaceae	Indigenous	6
150	*Tamarindus indica*	Siyambala	Tamarind	Caesalpinaceae	Indigenous	5
151	*Pterocarpus marsupium*	Gammalu	Indian kino	Fabaceae	Indigenous	1
152	*Tabebuia rosea*	Taburorea	Pink tabebuia	Bignoniaceae	Exotic	28
153	*Tecoma stans*	Kelani tissa		Bignoniaceae	Exotic	3
154	*Vitex negundo*	Nika	Chaste Tree	Lamiacece	Indigenous	2
155	*Wodyetia bifurcata,*	Foxtail palm	Foxtail palm	Arecaceae	Exotic	10
156	*Xanthostemon chrysanthus*	Golden penda	Golden penda	Myrtaceae	Exotic	1

According to the results, 1247 plants were counted in the 6 zones of the OUSL and 156 plant species recorded; they belong to 75 Genera and 44 families. Among these plants 6 are endemic to Sri Lanka, 111 are indigenous, and 39 are Exotic. As shown in figure 3, the most abundant family is Fabaceae with 21 species, followed by Myrtaceae with 15 species and Rubiaceae with 09 species. *Mangifera indica* is the most abundant species (92). *Ficus decepiums* is the second most abundant (53), and *Cocos nucifera* is the third most abundant (48). The plants with their scientific name, English name, Family and status and number of plants shown in the Table 1.

According to the latest National Red list of Sri Lanka (2020), there are 894 endemic species of flowering plants (Angiosperms) in Sri Lanka and 06 species among them were recorded in OUSL. They were 01 *Dipterocarpus zeylanicus* (Hora), 18 *Mesua ferra* (Na), and 03 *Neolitsea cassia* (Dawul Kurudu), 01 *Litsea iteodaphne* (Kalu Nika), and 01 *Mangifera zeylanica* (Etamba). These endemic trees are very important in plant diversity and OUSL executive conservation studies and it's possible to improve the endemic plants in future tree planting programs (Fig. 3).

The World Conservation Monitoring Centre identifies Sri Lanka as a biodiversity "hotspot" (Caldecott *et al.*, 1994). The country is home to approximately 7,500 indigenous plant species, including 3,360 flowering plants, of which around 830 (25%) are endemic to the island (Gunatilleke and Gunatilleke, 1990). As illustrated in Figure 04, only 4% of the species in this study area are endemic, highlighting the need to prioritize the selection of suitable endemic trees in future tree planting initiatives. Additionally, the area includes 111 indigenous species (71%) and 39 exotic species (25%) (Fig. 4).

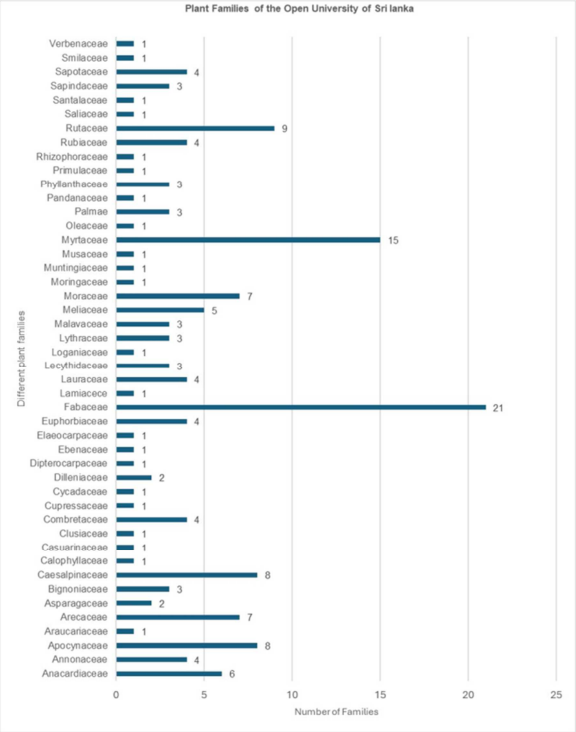

Fig. 3. The number of plants in each family

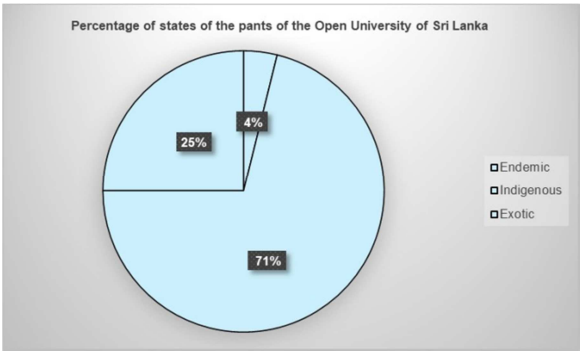

Fig. 4. The percentage of status of plants OUSL

Document analysis showed a growing focus on sustainability within the university's policies, with recent Green Policy outlining steps to enhance biodiversity on Universities. This aligns with the concept of universities acting as leaders in environmental sustainability (Cohen, 2019). The OUSL case study provides a promising glimpse into the potential benefits of university biodiversity. The presence of diverse flora suggests a healthy ecosystem that likely contributes to improved air quality (Pataki *et al.*, 2011) and provides habitat for beneficial organisms (Miller, 2009). This aligns with the concept of universities acting as living laboratories for environmental research (Nyahongo, 2022).

Furthermore, university biodiversity contributes significantly to the overall environmental health of the surrounding area. A well-maintained campus ecosystem can act as a natural filter, absorbing pollutants and improving air quality (Pataki *et al.*, 2011). Additionally, a diverse campus can provide habitat and breeding grounds for pollinators and other beneficial organisms, contributing to a healthy and resilient urban environment (Miller, 2009). These benefits extend beyond the university grounds, creating a ripple effect that improves the ecological well-being of the entire city. University ecosystems can provide habitat and breeding grounds for birds, insects including pollinators and other beneficial organisms, creating a ripple effect that extends beyond university grounds to benefit the entire city.

As shown in Table 2, the Shannon index was calculated using the zone wise collected data and the equation.

Table 2. The Shannon Index of the Nawala Premises

Zones	Total area (m^2)	Total no of species	Total count of all species	Biodiversity index
Zone A	32289.2	79	291	3.9248
Zone B	12061.5	65	159	3.7874
Zone C	22721.8	45	139	3.3642
Zone D	38534.1	102	390	4.0340
Zone E	14449.5	39	161	3.2747
Zone F	13008.4	39	107	3.3514
OUSL	133064.5	156	1247	4.4008

Considering the study on plants in 2016 there were 722 plants recorded, encompassing 95 plant species belonging to 75 genera and 33 families and 45% being native (Madurapperuma and Kuruppuarachchi, 2016). In contrast, the survey in 2024 reported total of 1247 plants, including 156 plant species belonging to 121 genera, and 46 families and 75% of them being native. This shows that there is a gradual increase in the plant diversity in OUSL from 2016 to 2024.

According to the Shannon Index, the overall value for OUSL was notably high at 4.40. Zone D exhibited the highest value among the zones at 4.03, attributed to the presence of the university forest plot in this area.

The other zones had the following values: Zone A at 3.92, Zone B at 3.78, Zone C at 3.36, Zone F at 3.35, and Zone E at 3.27.

The Open University of Sri Lanka (OUSL) hosts a notable diversity of flowering plants species despite its location in an urban area. Situated adjacent to the Nawala canal, with three sub-canals intersecting its grounds and linking to the Kirulapana canal, the university benefits from these waterways serving as corridors and creating microclimates conducive to flora. Moreover, the riverbank vegetation maintained by the Sri Lanka Land Development Corporation alongside the university's own tree cover forms a continuous forested area. Although this study is restricted to flowering trees there are lot of other flora and fauna to be considered in future studies which may definitely increase the biodiversity value of the OUSL.

By documenting plant species, the research revealed a diverse ecosystem supporting a range of life forms. While the findings highlight the potential ecological benefits of campus biodiversity, a more comprehensive assessment of its impact on environmental friendliness requires further investigation. To fully understand the role of the university in conserving biodiversity and promoting sustainability, long-term monitoring, quantitative analysis, and the incorporation of additional environmental indicators are recommended. By recognizing the value of university biodiversity and implementing appropriate conservation measures, the Open University of Sri Lanka can contribute significantly to environmental sustainability and serve as a model for other educational institutions.

Enhancing conservation efforts and promoting native species on university, requires a comprehensive approach that includes developing a detailed biodiversity management plan, increasing native plantings, enhancing habitat connectivity, implementing sustainable landscaping practices, and establishing dedicated conservation areas.

Promoting green infrastructure, engaging the University community, monitoring biodiversity, collaborating with external organizations, and supporting environmental education and research are also essential. Integrating environmental sustainability into campus management involves policy development, resource allocation, energy and water conservation, and sustainable transportation initiatives. By adopting these strategies, OUSL can significantly improve environmental sustainability, benefiting the local ecosystem and serving as a model for other institutions.

In conclusion, fostering biodiversity within universities is not merely an aesthetic choice; it is a strategic investment in environmental education, research, and overall sustainability. This study will explore these benefits further, examining specific examples of how universities are leveraging their biodiversity to become leaders in environmental friendliness. It will also explore the challenges of maintaining biodiversity within urban environments and propose solutions to maximize its positive impact.

To achieve this, a comprehensive survey will be conducted to document and classify flowering trees species, including categorization by endemism, residency, and origin. The findings will inform recommendations for enhancing conservation practices, promoting native species, and integrating environmental sustainability into campus management.

There is a direct relationship between plant diversity and Environmental Friendliness, according to Mori *et al.*, (2018) higher plant diversity usually enhances ecosystem services such as soil stabilization, water purification, and climate regulation. Diverse plant communities can better support various ecological functions, improving overall environmental quality. Also, Ecosystems with high plant diversity tend to be more resilient to disturbances like pests, diseases, and climate changes (Tilman *et al.*, 2006). This resilience contributes to long-term environmental stability and

sustainability. According to Hooper *et al.* (2005), Greater plant diversity often leads to more complex habitats, providing better support for wildlife and improving ecological interactions.

Conclusion

Despite its urban setting, the Open University of Sri Lanka's varied green spaces support a rich assemblage of flora, including 156 species from 75 genera and 44 families. The presence of 6 endemic, 111 indigenous, and 39 exotic species underscores the site's ecological significance. The predominance of certain families, particularly Fabaceae, Myrtaceae, and Rubiaceae, reflects diverse plant communities and ecological niches. The high abundance of *Mangifera indica* indicates a successful integration of this species within the university's environment. the Open University of Sri Lanka supports a diverse range of plant species and significantly contributes to plant biodiversity.

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