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# **RESEARCH ARTICLE**

## ASSESSING URBAN DENDROFLORA IN RANAVAV CITY, GUJARAT, INDIA

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#### ABSTRACT

Urban arboreal and pedological systems exert significant influence in mitigating nutrient pollution and airborne contaminants within urban settings. They also contribute to carbon sequestration, alleviate urban heat islands, and enhance water purity. Urban trees offer a wide range of ecosystem services, economic benefits, and support in densely populated urban areas. Ranavav showcases an impressive array of trees, including both native and cultivated ornamental species, despite the coexistence of industrial and natural elements. The study area was divided into Seven zones to conduct a systematic tree census, utilising local flora for taxonomic identification. A comprehensive investigation documented 63 tree species from 27 botanical families, including notable families such as Moraceae, Fabaceae, and Annonaceae. Trees possess the capacity to mitigate air pollution by altering microclimates and inhibiting the formation of secondary pollutants. Moreover, they serve as natural barriers, reducing noise from traffic and construction activities, thereby enhancing the aesthetic appeal and livability of urban environments.

Key words: Number of trees, Dendroflora, Ranavav city.

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#### **INTRODUCTION**

Urban tree and soil systems have the potential to play a significant role in reducing the concentration of nutrient pollution in runoff within urban areas. Additionally, urban areas are often focal points for atmospheric pollution arising from mobile and stationary sources (Garty et al., 1996; Johnson et al., 1982; Sawidis et al., 2011). Trees have long been recognized as a means to decrease levels of gaseous and particulate pollutants (Dochinger, 1980; Nowak et al., 2006). Nevertheless, the impact of specific tree species emitting volatile organic compounds on ozone formation remains an ongoing research focus, particularly in urban environments (Calfapietra et al., 2013; Chameides et al., 1992; Nowak et al., 2006). Apart from their role in absorbing air pollutants, urban green infrastructure, especially the tree component, can significantly influence the capacity for carbon sequestration in urban areas (Edmondson et al., 2012; Pataki et al., 2006). Green infrastructure, defined as vegetation systems intentionally designed to promote environmental quality, can reduce the intensity of heat islands by providing shade and evapotranspirational cooling Urban trees are arguably the most effective and economical approach to mitigating and adapting to urban heat islands (Norton et al., 2015; Solecki et al., 2005). Their potential to remove nutrient pollutants and certain heavy metals from stormwater can be further harnessed to enhance water quality and reduce pollution (Denman et al., 2016). Urban trees provide a range of ecosystem services, including provisioning, regulating, cultural, and supporting services (Escobedo et al., 2011; Salmond et al., 2016; Säumelet al., 2016), which offer diverse economic, social, and health benefits (Roy et al., 2012). Despite requiring relatively small ground surface areas, urban trees effectively utilize vertical space to provide vegetative surfaces, making them easier to integrate into cities, even in

densely populated neighbourhoods. Therefore, the planting and management of trees are crucial for ensuring, preserving, and supporting the delivery of ecosystem services and their associated benefits in cities where space is inherently limited (Haaland and van den Bosch, 2015; Vogt et al., 2017). The rapid growth of urban areas, coupled with climate change, gives rise to various issues such as air and noise pollution, the urban heat island effect, increased stress levels, habitat loss, and flash floods (Ahlfeldt and Pietrostefani, 2017; Bazaz et al., 2018; Berghauser Pont et al., 2020; Gren et al., 2018). Ranavav, located in the Porbander district of Saurashtra, holds immense ecological significance owing to its close proximity to the Barda hills, where the Barda Wildlife Sanctuary is nestled. The presence of the Barda Hills and their wildlife sanctuary has fostered a thriving and diverse environment within Ranavav. The city is adorned with an impressive array of trees, encompassing not only native and wild species but also meticulously cultivated ornamental trees. These trees not only add to the city's natural charm but also create a harmonious blend of ecological sustainability and aesthetic appeal. However, Ranavav's landscape is not solely shaped by its natural elements. The city is also home to a significant mining and mineralbased industrial sector due to the presence of rich minerals like limestone and chalk, which have undeniable implications for the local climate. The industrial activities in Ranavav exert an influence on factors such as air quality, temperature levels, and precipitation patterns, thereby affecting the overall climatic conditions experienced by its residents. Nevertheless, amidst the interplay of industries and natural surroundings, the diverse range of tree species in Ranavav stands out as a valuable asset. These trees serve as an essential component in maintaining the ecological balance of the city, contributing to its overall environmental well-being, and serving as a source of pride for its inhabitants. In this study, a comprehensive tree census was conducted, encompassing the scientific identification and counting of each tree species. The survey was meticulously conducted, covering every street and road within the city limits of Ranavav.

Study sites: Ranavav is a city located in the Porbandar district of Gujarat, India. Situated in the western part of the country, Ranavav is positioned on the Saurashtra Peninsula, which extends into the Arabian Sea. Ranavav is located at 21.68°N, 69.75°E (Fig. 1). It has an average elevation of 40 metres (130 feet). It has an approximate area of around 2.5 square kilometres and is divided into seven zones. As of the 2011 Indian census, this city had a population of 46,018. Geographically, Ranavav is characterised by a diverse landscape. The region features a mix of plains, hills, and coastal areas. There is also one historical place called Jambuvant's Caves from the time of the Ramayana. Ranavav experiences a typical coastal climate, influenced by its proximity to the Arabian Sea. The summers are generally hot and dry, with temperatures reaching high levels. The monsoon season brings rainfall to the region, typically occurring between June and September. Winters in Ranavav are relatively mild, with cooler temperatures.

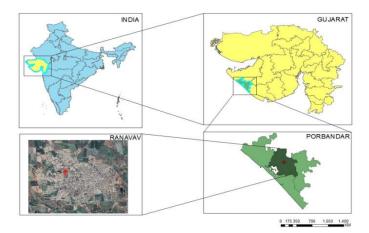


Fig. 1. Location of the study site

**Survey:** The study area is divided into seven zones (Fig. 2), and the counting of trees was done zone-wise. Plant species were identified using local flora. The survey was conducted meticulously in the year 2022, covering every street and road within the city limits of Ranavav.



Fig. 2. Zonation of the city

### **RESULT AND DISCUSSION**

A total of 1944 individual trees were recorded during the study, representing 63 different species from 31 families. Among these, 62 species belong to the Angiosperm category, while one species belongs to the Gymnosperm category. The highest number of trees was recorded in zone 7, while the lowest number of trees was recorded in zone 6 (Table 1).

The species with the lowest number of trees recorded include Albizia lebbeck, Annona muricata, Annona reticulata, Caryota urens, Ficus elastica, Mitragyna parvifolia, Morinda citrifolia, Araucaria columnaris, Mimusops elengi, Prosopis cineraria, and others (Table 2). On the other hand, some of the major tree species encountered during the study were Moringa oleifera, Tamarindus indica, Delonix regia, Senna siamea, Alstonia scholaris, Ficus benghalensis, Ficus religiosa, Polyalthia longifolia, Cocos nucifera, and Azadirachta indica (Table 3).



Fig. 3 Some tree species of Ranavav city (A.Annona muricata L., B.Cordia sinensis DC., C.Gmelina arborea Roxb., D. Manilkara hexandra Dubard, E.Mitragyna parvifolia Korth., F.Morinda citrifolia L.).

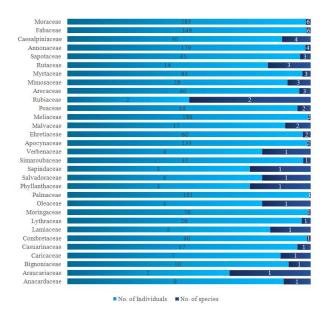


Fig. 4. Families with their numbers of species and individuals in Ranavav city limits

#### Table 1. Tree species with their numbers in Ranavav city limits

One of the second of	Sr. No.	Scientific Name	Common Name	Family				Zones		T	1	Total
2         Allarding exclusions, Allar and Samasha Palescan.         2         1         1         1         1         1         3         1           4         Massian schabig: (1) Rite.         Segangeri         Aprogram exclusions.         1 <td></td> <td></td> <td></td> <td>,</td> <td>1</td> <td></td> <td></td> <td></td> <td>-</td> <td>-</td> <td>7</td> <td></td>				,	1				-	-	7	
3         Moral Mode (1 , 1) Ren.         Support         Paper Support         .					1						-	
4         Atomic activation L.         Space Description L.					_		-		-		-	
5         Amoun surgeants         L.         Bandin         Amounescent         23         17         1         1         2         12         12         12         12         12         12         12         12         12         12         12         12         13         14         1					10				-		13	31
6         Automate L, Corrang Pergelands         7         -         1         -         2         -         -         1         -         -         -         -         -         -         -         1         -         -         -         1         -         1         -         1         -         1         -         1         -         1         -         1         1         -         1         1         1         1         1         1         1         1         1         1         1 <th1< th=""> <th1< th="">         1         1</th1<></th1<>					-						-	1
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10       Rambus valgers behad, est LC.Wendt.       Yam.       Paeciae       25       37       31       53       0       1       12         11       Radius prograve L.       Papaya       Carcias prograve L.       9       -       1       -       -       -       -       1       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       2       -       7       7       7       2       1       1       5       7       2       2       7       1       5       -       -       1       3       1<					-					_		
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12       Carica page year.       Papaya       Caricacasa       1       -       1       3       0       -       1       3       0       -       1       3       1		0			_	37	31	15	30	_	34	
13       Caroots urens L.       Shir Jan       Accassos       -       3       -       -       2       -       2       7       2       7       1         14       Caroutina cyntrol (plot left freem)       Kanon       Apportance (plot left freem)       Name       7       1       -       -       1       -       -       1       -       1       -       1       -       1       -       1       -       1					-	-		-	-		-	
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16       Crab generandre (1.) Claards.       Karpok       Marboaces       -       -       1       2       5       -       -       3         17       Circus Nieme (1.) Obsch       Limbeli       Narriseli       Arcsaceas       -       -       1       -       1       -       1       3         18       Corots encifen L.       Guadi       Condinecce       -       -       2       2       2       2       1       1       2       1		Cascabela thevetia (L.) Lippold	Pili Karen	Apocynaceae	-		1					-
17       Chron K lines (1, Oblock       Limbufi       Buncase       -       -       -       -       -       -       -       1       -       1       -       1       -       1			Zuri	Casuarinaceae	4	2	-			5	7	
18       Constance(pru L.       Nuryali       Avecasas       -       1       -       1       -       1       -       1       -       1       -       1       3         19       Cordin struemist ans (and biosmon Corollaceae       22       32       27       1       28       10       31       16       3       -       6       2       6       17         21       Defonts struemist ans (and L) Gamble       Sundacao       Fabaccae       3       -       4       -       1       -       -       4       2       13         22       Defonts regis (book Net       Nakov Vans       Ponecae       13       17       18       8       18       3       14       9       11       -       7       -       22         25       Excasyntas (abodi Nets       Nigiri       Myncaee       -       0       6       3       7       2       9       5       11       10       32         26       Ficas anglisinn Sm.       Piper       Monecae       -       0       1       -       -       -       1       10       2       2       9       5       1       1       3       -			Kapok	Malvaceae	-		-	12	5	-	-	
19       Cordination Grows.       Ganda       Condinacea       22       22       71       12       84       10       31       161         20       Cordinacea       -       -       2       3       -       6       1       -       1       2       6       17         21       Daibergu Ingloin Roxb.       Sundau       Fabacca       3       -       4       -       4       2       4       3       -       4       2       4       3       -       4       2       4       3       -       4       2       4       3       -       4       2       4       3       -       4       2       4       3       -       4       2       4       3       1       4       9       13       1       1       3       -       -       5       2       5       1       1       0       3       7       2       2       3       8       23       11       -       1       -       -       -       3       1       1       0       3       7       2       2       -       -       1       1       0       3       7       2 </td <td>17</td> <td>Citrus X limon (L.) Osbeck</td> <td>Limbudi</td> <td>Rutaceae</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td>-</td> <td>-</td> <td>-</td>	17	Citrus X limon (L.) Osbeck	Limbudi	Rutaceae	-	-				-	-	-
	18	Cocos nucifera L.	Nariyedi	Arecaceae	-	-	1	-	1	-	1	3
21         Datherga langthile Roch.         Simmali         Fabaceae         -         20         -         11         -         12         43           22         Delonix regio (Lojer ex Isole.) Raf.         Guimohor         Fabaceae         1         -         1         3         -         4         2         13           23         Delonix regio (Lojer ex Isole.) Raf.         Guimohor         Fabaceae         1         -         1         8         8         18         3         14         91           24         Dendrocalomas structus (Rod.) Aces         Nator Vian         Pacaceae         13         -         -         2         9         6         -         7         -         22           25         Excisopace globulas using structus (Non-Case         Val         Monaccae         4         -         0         3         -         -         -         3         3         -         -         -         3         3         -         -         -         -         3         3         -         -         -         3         3         -         -         -         3         3         -         -         -         -         3         3		Cordia dichotoma G.Forst.	Gundo	Cordiaceae	22	32		11	-	-		
22         Defonit cham (L) Gamble         Sandesaro         Fabaccac         1         -         4         -         -         4         2         13           23         Defonit craftm (Dath), Nec         Nakor Vans         Polaccac         1         1         1         3         -         -         -         5           24         Defonitions stricts (Roth), Necs         Nakor Vans         Polaccac         13         17         18         8         18         3         14         91           25         Execopting globulos subse, globulos         Nigiti         Mytroceac         -         9         6         -         7         -         22         9         5         11         0         39           26         Ficus melpisions L         Name         Man         Monecae         20         14         9         23         8         23         117           27         Ficus cellsions L         Analy         Monecae         -         3         -         -         -         -         3         12         -         -         -         5           30         Ficus cellsions L         Analy         Anscarulan cons         Analy         -	20	Cordia sinensis Lam.	Gundi	Cordiaceae		-	3	-	6	2	-	
21         Deduct: regist (Doyer ex Hock, Baf.         Galimohor         Fabaccae         11         -         1         3         -         -         -         5           24         Dendrocalmus stricus (Bok), Nees         Nikor Vans         Ponceae         113         17         18         8         14         91           25         Excisynas globulis subs, globulis         Nilgiri         Myraceae         -         -         9         6         7         -         22           26         Ficus onglosimus Nu.         Pipar         Moraceae         4         -         6         3         7         2         9         31           27         Ficus carica L         Angeer         Moraceae         -         3         -         -         -         -         3           28         Ficus caries         La         Pipdo         Moraceae         -         1         -         -         -         -         3         - </td <td>21</td> <td>Dalbergia latifolia Roxb.</td> <td>Sismadi</td> <td>Fabaceae</td> <td>-</td> <td>-</td> <td>20</td> <td>-</td> <td>11</td> <td>-</td> <td>12</td> <td>43</td>	21	Dalbergia latifolia Roxb.	Sismadi	Fabaceae	-	-	20	-	11	-	12	43
24         Dendrecalamus strictus (Raxb.) Nees         Nakor Vans         Poaceae         13         17         18         8         18         3         14         91           25         Excaliptus (Shuhus subp. globulus         Nilgiri         Myraccae         -         -         9         6         -         7         -         22           26         Ficus berghalonis L.         Vad         Moraccae         10         2         2         9         5         1         10         39           27         Ficus berghalonis L.         Vad         Moraccae         20         20         14         9         23         8         23         117           28         Ficus corizo L.         Anjeer         Moraccae         -         3         -         -         -         -         1           30         Ficus religiona L.         Pipalo         Moraccaea         -         3         -         2         -         -         5           31         Manifaro abroat (D, Phone         Bonte Palm         Areaccaea         -         3         -         1         -         -         8         5         5         5         8         55         5 </td <td>22</td> <td>Delonix elata (L.) Gamble</td> <td>Sandesaro</td> <td>Fabaceae</td> <td>3</td> <td>-</td> <td>4</td> <td></td> <td>-</td> <td>4</td> <td>2</td> <td>-</td>	22	Delonix elata (L.) Gamble	Sandesaro	Fabaceae	3	-	4		-	4	2	-
25       Eucaloptus globulus subse, globulus       Nilgiri       Mytaceae       -       -       9       6       -       7       -       22         26       Ficus amplisium Sm.       Pipar       Moraceae       10       2       2       9       5       1       10       39         27       Ficus carica L.       Anjeer       Moraceae       20       14       9       23       8       23       11         28       Ficus carica L.       Anjeer       Moraceae       -       3       -       -       -       -       3         30       Ficus carica L.       Pipdo       Moraceae       -       1       -       -       -       1       -       -       -       1       -       -       -       1       -       -       -       -       1       -       -       -       -       -       -       5       3       3       -       2       -       -       -       -       -       -       -       -       -       -       -       1       5       5       5       8       5       5       5       8       5       5       5       5       5 <td>23</td> <td>Delonix regia (Bojer ex Hook.) Raf.</td> <td>Gulmohor</td> <td>Fabaceae</td> <td>1</td> <td>-</td> <td>1</td> <td>3</td> <td>-</td> <td>-</td> <td>-</td> <td>5</td>	23	Delonix regia (Bojer ex Hook.) Raf.	Gulmohor	Fabaceae	1	-	1	3	-	-	-	5
Pipur         Monecae         10         2         2         9         5         1         10         39           27         Ficus benghalenis L         Vad         Monecae         4         -         6         3         7         2         9         31           28         Ficus carica L         Anjeer         Monecae         20         20         14         9         23         8         23         117           29         Ficus clastica Roxb, ex Homem.         Rubber Tree         Monacae         -         1         -         -         -         1         1         -         -         -         1         1         -         -         -         1         1         -         -         -         1         1         -         -         -         1         1         -         -         -         1         1         -         -         1         1         1         5         33         Margierr andrez         14         Markar apare (D, P) Apubral         Rayan         Sapotaceae         8         -         -         -         -         8         5         5         5         8         5         5         5	24	Dendrocalamus strictus (Roxb.) Nees	Nakor Vans	Poaceae	13	17	18	8	18	3	14	91
27       Ficus barghalewist L       Vad       Monaceae       4       -       6       3       7       2       9       31         28       Ficus catrica L       Anjeer       Monaceae       -       3       -	25	Eucalyptus globulus subsp. globulus	Nilgiri	Myrtaceae	-	-	9	6	-	7	-	22
27       Ficus barghalewist L       Vad       Monaceae       4       -       6       3       7       2       9       31         28       Ficus catrica L       Anjeer       Monaceae       -       3       -	26	Ficus amplissima Sm.	Pipar	Moraceae	10	2	2	9	5	1	10	39
29         Ficus elastica Roxb. ex Hornem.         Rubber Tree         Moraceae         -         3         -         -         -         -         -         -         3         3           30         Ficus religioa L         Pipdo         Moraceae         -         -         1         -         -         -         -         -         1         -         -         -         -         1         1         -         -         -         1         1         -         -         -         1         1         -         -         -         1         1         -         -         -         1         1         -         -         -         5         5           31         Manifkara bacandrach         Rayan         Sapotaceae         19         6         9         -         8         -         1         -         -         -         8         5         5         7         1         -         -         -         8         1         1         1         -         1         -         -         -         1         1         1         -         -         -         2         1         1         1	27	Ficus benghalensis L.	Vad	Moraceae	4	-		3	7	2	9	31
30         Ficus religions L         Pipdo         Moraccac          I              I           31         Gnelina arborea Rock ex Sm.         Shevan         Lamiaceac          I         I <td>28</td> <td>Ficus carica L.</td> <td>Anjeer</td> <td>Moraceae</td> <td>20</td> <td>20</td> <td>14</td> <td>9</td> <td>23</td> <td>8</td> <td>23</td> <td>117</td>	28	Ficus carica L.	Anjeer	Moraceae	20	20	14	9	23	8	23	117
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	29	Ficus elastica Roxb. ex Hornem.	Rubber Tree	Moraceae	-	3	-	-	-	-	-	3
31Gmelina arborea Raxb. ex Sm.ShevanLamiaceae24181292493012632Hyphorbe Idgenicatiki (L.I.Bailey) II.E.MooreBottle PalmAreaceae-3-2533Manifkara tapota (L.)DubordRayanSapotaceae8835Manifkara tapota (L.)P.RoyenChikuSapotaceae-7-1836Melia acedarachL.Bakayan LindoMeliaceae1511655585537Ministops elergi L.BorsaliSapotaceae11-1-338Mirizogan partificia (Koh.) Korth.KalamRubiaceae-22211640Morinda cirifolia (Koh.) Korth.KalamRubiaceae-11-11 <td>30</td> <td></td> <td>Pipdo</td> <td>Moraceae</td> <td>-</td> <td>-</td> <td>1</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>1</td>	30		Pipdo	Moraceae	-	-	1	-	-	-	-	1
32       Hypphorbe lagenicaulis (L.H.Bailey) H.E.Moore       Bottle Palm       Arecaceae       -       3       -       2       -       -       5         33       Mangiffera indica L.       Aambo       Anacardiaceae       19       6       9       -       8       -       15       57         34       Manilkara kexandra (Roxh.) Dubard       Rayan       Sapotaceae       8       -       -       -       8       -       -       8       -       -       8       -       -       8       -       -       8       -       -       8       -       -       8       -       -       8       -       -       8       -       -       8       5       5       5       5       8       55       7       1       -       -       -       -       1       3       3       3       Miragyna parylolio (Roxh) Korth.       Kalam       Rubiaceae       -       21       10       10       77       7       29       135         41       Moring alighta Lin.       Rohaica tripfioli L.       Alagopalav       Annonaceae       -       -       -       -       1       1       1       -       1       1 </td <td>31</td> <td>Gmelina arborea Roxb. ex Sm.</td> <td></td> <td>Lamiaceae</td> <td>24</td> <td>18</td> <td>12</td> <td>9</td> <td>24</td> <td>9</td> <td>30</td> <td>126</td>	31	Gmelina arborea Roxb. ex Sm.		Lamiaceae	24	18	12	9	24	9	30	126
33       Mangifera indica L.       Aambo       Anacardiaceae       19       6       9       -       8       -       15       57         34       Manifkara taptot (Dxb.) Dubard       Rayan       Sapotaceae       8       -       -       -       -       -       8         35       Manifkara taptot (D.) P.Royen       Chiku       Sapotaceae       15       11       6       5       5       5       8       55         37       Minacops elengi L.       Barsali       Sapotaceae       1       -       -       1       -       -       1       -       -       1       -       -       2       -       -       -       1       -       -       1       -       -       2       -       -       -       -       2       2       -       -       -       -       1       1       -       1       -       1       1       1       1       1       -       1       <	32		Bottle Palm	Arecaceae	-		-	2		-	-	
34       Manilkara hexandra (Roxb.) Dubard       Rayan       Sapotaceae       8       -       -       -       -       -       -       8         35       Melia cacdurach       Chiku       Sapotaceae       -       7       -       1       -       -       8         36       Melia cacdurach       Bakayan Limdo       Meliaceae       -       7       -       1       -       -       -       8         36       Melia cacdurach       L       Bakayan Limdo       Meliaceae       -       2       -       -       -       -       -       2         37       Mimusops elengi L.       Borsali       Sapotaceae       -       1       -       1       -       1       -       -       -       1         38       Miragyan Limdo       Maliaceae       -       1       -       -       -       1       1       1       1       -       1 <td>33</td> <td></td> <td>Aambo</td> <td>Anacardiaceae</td> <td>19</td> <td>-</td> <td>9</td> <td></td> <td>8</td> <td>-</td> <td>15</td> <td></td>	33		Aambo	Anacardiaceae	19	-	9		8	-	15	
35       Manilkara zapota (L.) P. Royen       Chiku       Sapotaceae       -       7       -       1       -       -       -       8         36       Melia azedarach L.       Bakayan Limdo       Meliaceae       15       11       6       5       5       5       8       55         37       Minnspop elengi L.       Borsali       Sapotaceae       1       -       1       -       1       -       1       -       1       -       1       -       1       -       -       1       -       -       1       -       -       1       -       -       1       -       -       1       -       -       -       -       -       -       1       1       -       -       -       -       1       1       1       -       -       -       -       -       -       -       1			Ravan	Sapotaceae	8		-	-		-		-
36       Melia azedarach L.       Bakayan Limdo       Meliaceae       15       11       6       5       5       8       55         37       Mimusops elengi L.       Borsali       Sapotaceae       1       -       1       -       1       -       3         38       Mitraggma parvifolia (Roxb.) Korth.       Kalam       Rubiaceae       -       2       -       -       -       -       -       -       2         39       Polyathita longifolia (Sonn.) Thwaites       Aasopalav       Annonacceae       -       1       -       -       -       -       -       -       -       1       1       -       -       -       -       -       -       -       -       -       -       -       -       1       1       1       -       1       -       1       1       1       1       -       1       -       1       1       1       1       1       1       1       1       -       1       -       1       -       1       -       1       1       1       1       -       1       -       1       1       1       -       1       1       -       5			,		-	7	-	1	-	-	-	-
37       Minusops elengi L.       Borsali       Sapotaceae       1       -       -       1       -       1       -       3         38       Mitragyna parvifolia (Roch.) Korth.       Kalam       Rubiaceae       -       2       -       -       -       -       -       2       -       1       -       -       -       -       -       -       -       -       -       -       -       1       1       1       -       1       1       1       -       5       1       1       1       1       1       1       -       1       1       1       -       1			Bakayan Limdo		15		6	5	5	5	8	
38         Mitragina parifolia (Roxb.) Korth.         Kalam         Rubiaceae         -         2         -         1         1           40         Moringa olejfola (Sonn,) Thwaites         Aasopalav         Annonaceae         21         21         20         10         27         7         29         135           41         Moringa olejfora Lim.         Saragvo         Moringaceae         -         -         -         -         1         1         -         1         -         5           43         Muraya koenigii (L.) Spreng.         Mitho Limdo         Rutaceae         1         1         4         1         -         -         1         4           45         Parkinsonia aculeata L         Ram Baval         Fabaceae         -         -         2         1         -		Mimusons elengi L.	-	Sapotaceae								
39       Polyalthia longifolia (Sonn.) Thwaites       Aasopalav       Annonaccae       -       -       1       -       -       -       1         40       Moringa cirrifolia L.       Aal       Rubiaccae.       21       21       20       10       27       7       29       135         41       Moringa cirrifolia L.       Saragvo       Moringaceae       -       4       3       10       -       1       1       -       1       -       -       -       -       1       1       -       1       1       -       -       1       4       4       7       Probreationa tadavistiera Lon       Rassana					-	_		-	+	-		
40         Morinda citrifolia L.         Aal         Rubiaceae.         21         21         20         10         27         7         29         135           41         Moringa celifera Lam.         Saragvo         Moringaceae         -         -         -         -         -         -         -         -         1         1           42         Morus alba L.         Shetur         Monaceae         8         12         15         7         14         8         12         76           43         Muraya koenjeji (L.) Spreng.         Mitho Lindo         Ruteceae         1         1         1         -         -         -         -         -         -         4           45         Parkinsonia aculeata L.         Ram Baval         Fabaceae         -         -         2         1         -         -         1         4           46         Peltophorum pterocarpum (DC.) Backer ex K.Heyne         Kon Mahor         Fabaceae         5         -         2         -         -         1         4         3         14           48         Phyllanthus acidus (L.) Skeels         Aamra         Phyllanthaceae.         1         1         -         -					-		-		-	-	-	
41       Moringa oleifera Lam.       Saragvo       Moringaceae       -       -       -       -       -       1       1         42       Morus alba L.       Shetur       Monceae       8       12       15       7       14       8       12       76         43       Murraya koenigii (L.) Speng.       Mitho Limdo       Rutceae       1       1       1       1       -       1       -       5         44       Nycitanthes arbor-tristis L.       Paarijatak       Oleaceae       4       -       -       -       4         45       Parkinsonia acuteata L.       Ram Baval       Fabaceae       -       -       2       1       -       1       4         46       Peltophorum pterocarpum (DC.) Backer ex K.Heyne       Son Mahor       Fabaceae       1       -       2       -       -       4       3       14         47       Phoenix dachylfera L.       Khajuri       Arceaceae       5       -       2       -       -       4       3       14         48       Phyllanthas acidus (L.) Skeels       Aamra       Phyllanthaceae.       1       -       1       1       -       1       1       -			Ŷ		21	21		10	27	7		135
42       Moras alba L.       Shetur       Moraceac       8       12       15       7       14       8       12       76         43       Murraya koenigii (L.) Spreng.       Mitho Limdo       Rutaceac       1       1       1       1       -       1       -       5         44       Nyctanthes arbor-tristis L.       Parijatak       Oleaceac       4       -       -       -       -       4         45       Parkinsonia aculeata L.       Ram Baval       Fabaceace       -       -       2       1       -       -       1       4         46       Peltophorum pterocarpum (DC.) Backer ex K.Heyne       Son Mahor       Fabaceae       1       -       2       -       -       4       3       14         47       Phoenix dactylifera L.       Khajuri       Arecaceae       5       -       2       -       -       4       3       14         48       Phyllanthus acidus (L.) Skeels       Aamra       Phyllanthaceae.       1       -       -       1       1       -       1       5       15       64         50       Prosopis cineraria (L.) Druce       Khijado       Fabaceae       -       -       1 </td <td></td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>1</td> <td>1</td>		5					-		-		1	1
43       Murraya koenigii (L.) Spreng.       Mitho Limdo       Rutaceae       1       4         44       Peltophorum pterocarpum (DC.) Backer ex K.Heyne       Son Mahor       Fabaceae       1       -       1       1       -       1       4       1       4       1       4       1       4       1       4       1       1       -       1       1       1       1       1       1       1       1       1       1			ě	e e	8	12	15	7	14	8	12	76
44Nyctanthes arbor-tristis L.PaarijatakOleaceae4445Parkinsonia aculeata L.Ram BavalFabaceae211446Peltophorum pterocarpum (DC.) Backer ex K.HeyneSon MahorFabaceae1-21447Phoenix dactylifera L.KhajuriArecaceae5-2431448Phyllanthus acidus (L.) SkeelsAamraPhyllInthaceae.111-249Prithceellobium dulce (Roxb.) Benth.Bakhay AambliFabaceae11-2250Prosopis cineraria (L.) DruceKhijadoFabaceae112251Prosopis juliflora (Sw.) DC.Gando BavalFabaceae112252Psidlum guajava L.JaamfalMyrtaceae23631512153Punica granatum L.DaadamLythraceae114456Senna siamea (Lam.) H.S.Irwin & BarnebyKassodFabaceae32259Tecoma stans (L.) Juss. ex KunthVasantBigoniaceae71413316 <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td>						-		-	-	-		
45       Parkinsonia aculeata L.       Ram Baval       Fabaceae       -       -       2       1       -       -       1       4         46       Peltophorum pterocarpum (DC.) Backer ex K.Heyne       Son Mahor       Fabaceae       1       -       2       1       -       1       4         47       Phoenix dactylifera L.       Khajuri       Arecaceae       5       -       2       -       -       4       3       14         48       Phyllanthus acidus (L) Skeels       Aamra       Phyllanthaceae.       1       -       -       -       1       1       -       1       3         50       Prosopis cineraria (L.) Druce       Khigado       Fabaceae       -       -       1       1       -       1       3       5       15       64         51       Prosopis juijflora (Sw.) DC.       Gando Baval       Fabaceae       -       -       1       1       -       -       2       10       42       2       10       42       2       10       42       2       10       42       2       10       4       43       11       4       45       33       15       15       64       3 <th< td=""><td></td><td>, , , , , , , , , , , , , , , , , , , ,</td><td></td><td></td><td>_</td><td></td><td></td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></th<>		, , , , , , , , , , , , , , , , , , , ,			_			-	-	-	-	-
46Peltophorum pterocarpum (DC.) Backer ex K.HeyneSon MahorFabaceae1-21447Phoenix dactylifera L.KhajuriArecaceae5-2431448Phyllanthus acidus (L.) SkeelsAamraPhyllanthaceae.1431448Phyllanthus acidus (L.) SkeelsAamraPhyllanthaceae.111-249Prithecellobium dulce (Roxb.) Benth.Bakhay AambliFabaceae11-1350Prosopis cineraria (L.) DruceKhijadoFabaceae11785135156451Prosopis juliflora (Sw.) DC.Gando BavalFabaceae11252Psidium guajava L.JaamfalMyrtaceae236315121254Salvadora oleoides Decne.Mithijaar, MotipiluSalvadoraceae112655Sapindus mukorossi Gaertn.ArithaSapindaceae1-1133122110356Senna siamea (Lam.) H.S.Irwin & BarnebyKassodFabaceae-2-1533122110358Tamarindus indica L.Aambli			5		_		<u> </u>		-	-	1	
47       Phoenix dactylifera L.       Khajuri       Arecaceae       5       -       2       -       -       4       3       14         48       Phyllanthus acidus (L.) Skeels       Aamra       Phyllanthaceae.       1       -       -       -       1       -       2         49       Pithecellobium dulce (Roxb.) Benth.       Bakhay Aambli       Fabaceae       -       -       -       1       1       -       1       3         50       Prosopis cineraria (L.) Druce       Khijado       Fabaceae       11       7       8       5       13       5       15       64         51       Prosopis juiflora (Sw.) DC.       Gando Baval       Fabaceae       -       -       1       1       -       -       2       1       2       10       42       14         53       Punica granatum L.       Jaamfal       Myraceae       2       3       6       3       1       5       1       21       10       42       2       10       42         54       Salvadora oleoides Decne.       Mithijaar, Motipilu       Salvadoraceae       -       -       5       11       10       -       -       26					_				-		1	
48         Phyllanthus acidus (L.) Skeels         Aamra         Phyllanthaceae.         1         -         -         -         1         1         -         2           49         Pithecellobium dulce (Roxb.) Benth.         Bakhay Aambli         Fabaceae         -         -         -         1         1         -         1         3           50         Prosopis cineraria (L.) Druce         Khijado         Fabaceae         11         7         8         5         13         5         15         64           51         Prosopis juliflora (Sw.) DC.         Gando Baval         Fabaceae         -         -         1         1         -         -         2           52         Psidium guajava L.         Jaamfal         Myrtaceae         2         3         6         3         1         5         1         21           53         Punica granatum L.         Daadam         Lythraceae         -         8         8         2         12         2         10         42           54         Salvadora oleoides Decne.         Mithijaar, Motipilu         Salvadoraceae         -         -         5         11         10         -         -         26					-			-			3	
49       Pithecellobium dulce (Roxb.) Benth.       Bakhay Aambli       Fabaceae       -       -       1       1       -       1       3         50       Prosopis cineraria (L.) Druce       Khijado       Fabaceae       11       7       8       5       13       5       15       64         51       Prosopis cineraria (L.) Druce       Gando Baval       Fabaceae       -       -       1       1       -       -       2         52       Psidium guajava L.       Jaamfal       Myrtaceae       2       3       6       3       1       5       1       21         53       Punica granatum L.       Daadam       Lythraceae       -       8       8       2       12       2       10       42         54       Salvadora oleoides Decne.       Mithijaar, Motipilu       Salvadoraceae       -       -       5       11       10       -       -       26         55       Sapindus mukorossi Gaertn.       Aritha       Sapindaceae       1       -       1       1       4         56       Senna siamea (Lam.) H.S.Irwin & Barneby       Kassod       Fabaceae       -       2       -       -       -       3       2 <td></td> <td></td> <td>5</td> <td></td> <td>_</td> <td></td> <td>-</td> <td></td> <td>+</td> <td>-</td> <td>-</td> <td>-</td>			5		_		-		+	-	-	-
50       Prosopis cineraria (L.) Druce       Khijado       Fabaceae       11       7       8       5       13       5       15       64         51       Prosopis juliflora (Sw.) DC.       Gando Baval       Fabaceae       -       -       1       1       -       -       2         52       Psidium guajava L.       Jaamfal       Myrtaceae       2       3       6       3       1       5       1       21         53       Punica granatum L.       Daadam       Lythraceae       -       8       8       2       12       2       10       42         54       Salvadora oleoides Decne.       Mithijaar, Motipilu       Salvadoraceae       -       -       5       11       10       -       -       26         55       Sapindus mukorossi Gaertn.       Aritha       Sapindaceae       1       -       1       1       4         56       Senna siamea (Lam.) H.S.Irwin & Barneby       Kassod       Fabaceae       -       2       -       15       33       12       21       103         58       Tamarindus indica L.       Aambli       Fabaceae       -       2       -       -       -       2      <				-	-					-	1	
51       Prosopis juliflora (Sw.) DC.       Gando Baval       Fabaceae       -       1       1       -       -       2         52       Psidium guajava L.       Jaamfal       Myrtaceae       2       3       6       3       1       5       1       21         53       Punica granatum L.       Daadam       Lythraceae       -       8       8       2       12       2       10       42         54       Salvadora oleoides Decne.       Mithijaar, Motipilu       Salvadoraceae       -       -       5       11       10       -       -       26         55       Sapindus mukorossi Gaertn.       Aritha       Sapindaceae       1       -       1       -       -       1       4         56       Senna siamea (Lam.) H.S.Irwin & Barneby       Kassod       Fabaceae       -       -       -       3       -       -       -       3         57       Syzygium cumini (L.) Skeels       Jaambu       Myrtaceae       -       22       -       15       33       12       21       103         58       Tamarindus indica L.       Aambli       Fabaceae       -       2       -       -       -       2					-			-	-	_	15	
52       Psidium guajava L.       Jaamfal       Myrtaceae       2       3       6       3       1       5       1       21         53       Punica granatum L.       Daadam       Lythraceae       -       8       8       2       12       2       10       42         54       Salvadora oleoides Decne.       Mithijaar, Motipilu       Salvadoraceae       -       -       5       11       10       -       -       26         55       Sapindus mukorossi Gaertn.       Aritha       Sapindaceae       1       -       1       -       -       1       1       4         56       Senna siamea (Lam.) H.S.Irwin & Barneby       Kassod       Fabaceae       -       -       -       3       -       -       -       3         57       Syzygium cumini (L.) Skeels       Jaambu       Myrtaceae       -       22       -       15       33       12       21       103         58       Tamarindus indica L.       Aambli       Fabaceae       -       2       -       -       -       2         59       Tecoma stans (L.) Juss. ex Kunth       Vasant       Bignoniaceae       7       14       13       3       16 <td></td> <td></td> <td>5</td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td>3</td> <td>13</td> <td></td>			5			-				3	13	
53       Punica granatum L.       Daadam       Lythraceae       -       8       8       2       12       2       10       42         54       Salvadora oleoides Decne.       Mithijaar, Motipilu       Salvadoraceae       -       -       5       11       10       -       -       26         55       Sapindus mukorossi Gaertn.       Aritha       Sapindaceae       1       -       1       1       4         56       Senna siamea (Lam.) H.S.Irwin & Barneby       Kassod       Fabaceae       -       -       3       -       -       -       3         57       Syzygium cumini (L.) Skeels       Jaambu       Myrtaceae       -       22       -       15       33       12       21       103         58       Tamarindus indica L.       Aambli       Fabaceae       -       2       -       -       -       2         59       Tecoma stans (L.) Juss. ex Kunth       Vasant       Bignoniaceae       7       14       13       3       16       7       17       77         60       Terminalia catappa L.       Deshi Badam       Combretaceae       2       -       3       2       -       3       -       10					-		-	-			-	
54       Salvadora oleoides Decne.       Mithijaar, Motipilu       Salvadoraceae       -       5       11       10       -       -       26         55       Sapindus mukorossi Gaertn.       Aritha       Sapindaceae       1       -       1       1       4         56       Senna siamea (Lam.) H.S.Irwin & Barneby       Kassod       Fabaceae       -       -       3       -       -       3         57       Syzygium cumini (L.) Skeels       Jaambu       Myrtaceae       -       22       -       15       33       12       21       103         58       Tamarindus indica L.       Aambli       Fabaceae       -       2       -       -       -       2         59       Tecoma stans (L.) Juss. ex Kunth       Vasant       Bignoniaceae       7       14       13       3       16       7       17       77         60       Terminalia catappa L.       Deshi Badam       Combretaceae       2       -       3       2       -       3       -       10         61       Thespesia populnea (L.) Sol. ex Corréa       Paras Pipalo       Malvaceae       9       10       4       4       15       5       13       60					-			-		-		
55       Sapindus mukorossi Gaertn.       Aritha       Sapindaceae       1       -       1       1       4         56       Senna siamea (Lam.) H.S.Irwin & Barneby       Kassod       Fabaceae       -       -       3       -       -       3         57       Syzygium cumini (L.) Skeels       Jaambu       Myrtaceae       -       22       -       15       33       12       21       103         58       Tamarindus indica L.       Aambli       Fabaceae       -       2       -       -       -       2       -       -       2       -       -       2       -       2       -       2       -       -       2       -       -       2       -       -       2       -       2       -       -       2       -       2       -       -       2       2       -       17       77         60       Terminalia catappa L.       Deshi Badam       Combretaceae       2       -       3       2       -       3       -       10         61       Thespesia populnea (L.) Sol. ex Corréa       Paras Pipalo       Malvaceae       9       10       4       4       15       5       13				· ·	+ -				-	1		
56         Senna siamea (Lam.) H.S.Irwin & Barneby         Kassod         Fabaceae         -         -         3         -         -         3           57         Syzygium cumini (L.) Skeels         Jaambu         Myrtaceae         -         22         -         15         33         12         21         103           58         Tamarindus indica L.         Aambli         Fabaceae         -         2         -         -         -         2           59         Tecoma stans (L.) Juss. ex Kunth         Vasant         Bignoniaceae         7         14         13         3         16         7         17         77           60         Terminalia catappa L.         Deshi Badam         Combretaceae         2         -         3         2         -         3         -         10           61         Thespesia populnea (L.) Sol. ex Corréa         Paras Pipalo         Malvaceae         9         10         4         4         15         5         13         60           62         Vachellia nilotica (L.) P.J.H.Hurter & Mabb.         Tatikyo Baval         Fabaceae         -         -         7         5         2         -         -         14           63 <td< td=""><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td></td<>					-						-	
57       Syzygium cumini (L.) Skeels       Jaambu       Myrtaceae       -       22       -       15       33       12       21       103         58       Tamarindus indica L.       Aambli       Fabaceae       -       2       -       -       -       2         59       Tecoma stans (L.) Juss. ex Kunth       Vasant       Bignoniaceae       7       14       13       3       16       7       17       77         60       Terminalia catappa L.       Deshi Badam       Combretaceae       2       -       3       2       -       3       -       10         61       Thespesia populnea (L.) Sol. ex Corréa       Paras Pipalo       Malvaceae       9       10       4       4       15       5       13       60         62       Vachellia nilotica (L.) P.J.H.Hurter & Mabb.       Tatikyo Baval       Fabaceae       -       -       7       5       2       -       14         63       Vitex negundo L.       Nagod       Lamiaceae       -       2       -       1       1       -       4		1										
58         Tamarindus indica L.         Aambli         Fabaceae         -         2         -         -         -         2           59         Tecoma stans (L.) Juss. ex Kunth         Vasant         Bignoniaceae         7         14         13         3         16         7         17         77           60         Terminalia catappa L.         Deshi Badam         Combretaceae         2         -         3         2         -         3         -         10           61         Thespesia populnea (L.) Sol. ex Corréa         Paras Pipalo         Malvaceae         9         10         4         4         15         5         13         60           62         Vachellia nilotica (L.) P.J.H.Hurter & Mabb.         Tatikyo Baval         Fabaceae         -         -         7         5         2         -         -         14           63         Vitex negundo L.         Nagod         Lamiaceae         -         2         -         1         1         -         4					-		-			_		
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62       Vachellia nilotica (L.) P.J.H.Hurter & Mabb.       Tatikyo Baval       Fabaceae       -       -       7       5       2       -       -       14         63       Vitex negundo L.       Nagod       Lamiaceae       -       2       -       1       1       -       4					-	_		-		-	_	
63         Vitex negundo L.         Nagod         Lamiaceae         -         2         -         1         1         -         4			-		-					-		
			-		-		7	5	-	-	-	
Total         283         285         270         191         365         157         393         1944	63		Nagod	Lamiaceae	_				-			
		Total			283	285	270	191	365	157	393	1944

Sr. No.	Scientific Name	Total No of Individuals	% of Total Individuals
1	Albizia lebbeck (L.) Benth.	1	0.05
2	Annona muricata L.	1	0.05
3	Annona reticulata L.	1	0.05
4	CaryotaurensL.	1	0.05
5	Ficus elasticaRoxb. ex Hornem.	1	0.05
6	MitragynaparvifoliaKorth.	1	0.05
7	Morindacitrifolia L.	1	0.05
8	Araucaria columnarisHook.	2	0.1
9	MimusopselengiL.	2	0.1
10	Prosopis cineraria (L.) Druce	2	0.1

Table 2. Minor tree species with their numbers in Ranavav city limits

Table 3. Ma	ior tree sp	ecies with	their num	bers in	Ranavav	city limits
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Sr. No.	Scientific Name	Total No of Individuals	% of Total Individuals		
1	Moringa oleifera Lam.	76	3.90		
2	Tamarindus indica L.	77	3.96		
3	Delonix regia (Bojer ex Hook.) Raf.	91	4.68		
4	Senna siamea(Lam.) H.S.Irwin&Barneby	103	5.2		
5	Alstoniascholaris (L.) R.Br.	111	5.70		
6	Ficus benghalensisL.	117	6.01		
7	Ficus religiosa L.	126	6.48		
8	Monoonlongifolium(Sonn.) B.Xue&R.M.K.Saunders	135	6.94		
9	Cocos nucifera L.	161	8.28		
10	Azadirachta indica A.Juss.	183	9.41		

The families Fabaceae and Moraceae had the highest number of species, each with thirteen and six species, respectively. Within these families, the Fabaceae family had the largest number of individual trees recorded (407), followed by the Moraceae family (283), and then the Meliaceae family (186). On the other hand, the families Araucariaceae, Phyllanthaceae, and Oleaceae had the lowest number of individuals recorded, with 2, 3, and 4 individuals, respectively. Furthermore, several families, namely Araucariaceae, Bignoniaceae, Caricaceae, Casuarinaceae, Combretaceae, Lamiaceae, Lythraceae, Moringaceae, Oleaceae, Palmaceae, Phyllanthaceae, Salvadoraceae, Sapindaceae and Simaroubaceae, each had one species represented in the recorded data (Fig. 4).

Urban Trees: Enhancing Prosperity and Quality of Life: The presence of trees in urban areas offers economic benefits in addition to their aesthetic appeal. They can increase property values, attract businesses, and enhance the overall marketability of neighbourhoods, thereby contributing to economic development and prosperity. Urban trees play a crucial role in reducing energy consumption through their provision of shade and improved thermal comfort, consequently diminishing the reliance on air conditioning. Furthermore, trees have the capacity to mitigate air pollution by modifying the microclimate and preventing the formation of secondary pollutants. The extent of air pollution reduction depends on the quantity of vegetation and prevailing weather conditions in a given locality. Access to green spaces with tree cover has been associated with improved mental wellbeing, reduced stress levels, and an overall enhancement of the quality of life for urban residents. Trees possess the ability to absorb and deflect sound waves, mitigating noise pollution. They act as natural barriers, buffering and muffling unwanted noise from traffic, construction, and other urban activities. They also soften the harshness of built environments by creating green spaces for relaxation and recreation and contributing to the overall aesthetic value of the city. By supporting urban biodiversity, trees help to maintain ecological balance and contribute to the overall health of the urban ecosystem. Urban trees' canopies also help to slow down rainfall, minimising erosion and flooding while allowing water to infiltrate into the soil, contributing to groundwater recharge. Trees also improve air quality by absorbing pollutants from the atmosphere and removing particulate matter (PM) and ozone (O3) from the air. These pollutants can cause respiratory problems, heart disease, and cancer. Overall, trees help to create a more comfortable microclimate in urban areas, making them more livable and enjoyable for residents. The incorporation of urban trees has become increasingly recognised as an effective approach to enhancing the visual appeal and livability of cities.

### CONCLUSION

Every tree holds immense value for humankind, and their presence in urban areas carries even greater significance. Ranavav city, despite its vast expanse, harbours a limited number of trees, amplifying the worth of each individual tree. It is crucial to make concerted efforts towards tree plantation and conservation of existing trees to enhance environmental well-being and improve the quality of life for the city's residents. This endeavour is pivotal for the preservation and sustenance of the city's ecosystem.

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