

"Road Side Trees of Raipur City"

Tiwari Shikha¹ Acharya² Dr Vaibhav

¹Research Scholar, Department Of Botany, Govt D.B. Girls P.G. College, Raipur.

²Assistant Professor, Department Of Botany, Govt D.B. Girls P.G. College, Raipur.

Corresponding Author: Tiwari Shikha

Abstract: Study of various plant species present in particular area helps in understanding plant diversity of that area. Present study focuses on area of Raipur city. Atal Nagar, Naya Raipur is the administrative capital of Chhattisgarh. Chhattisgarh came into existence on 1st November 2000. It is situated 21°14'14" North latitude, 81°38'15" East longitude. This state is situated in the central part of India. Since its declaration as State Capital, many development and construction projects have been initiated. With increase in its population, city area has also increased. This study efforts to enumerate the diversity of roadside plants of the Raipur City as well as the Capital City of Atal Nagar, Naya Raipur. Planting trees on road side is an ancient practice, shady and fruits bearing trees were planted on roadside since ancient times. With the progress of civilization, there has been an unprecedented increase in population and traffic, making plantation on road side essential to sustain the progress. Government is running many scheme under social forestry for plantations. In the present research the most common trees found on road side are *Alistonia scholaris* (satpani), *Albanthus excelsa* (Mahaneem), *Dalbergia sissoo* (sissoo), *Tectona grandis* (Sagun), *Mangifera indica* (Aam) and the species of *Albizia*. The observation period was 2017-18. Many ornamental trees like *Bahunia variegata* (Kachnar), *Bahunia purpurea* (Sonpatti), *Legistomia* species have been recorded. Some exotic trees like *Kigelia pinnata*, *Peltaphorum ferrugineum* are also identified. During the broadening of the existing roads and construction of new roads in Raipur and Atal Nagar, both the sides of road and median dividers has been planted with ornamental trees herbs, shrubs, and grasses. On highway No.21 also known as "GAURAV PATH" with plant species like *Tecoma stans* along with *Casurina equisetifolia*, *Tabebuia rosea*, *Plumeria rubra*, *Caryota urens*. Some trees of ethano botanical importance are also identified like *Putranjivika roxburghi* (putrajivika), *Phyllanthus emblica* (amla), *Terminalia arjuna* (arjun), *Moringa oleifera* (drum stick) along the roadside. Minor forest produce trees were also found like *Tamrindus indica*, *Azadirchata indica* (neem) *Sapindus trifoliata* (reetha). *Madhuca longifolia* (mahua), *Annona squamosa* (seeta phal) are some common fruits trees. In the Study area trees classified under exotic, ornamental, and wild trees have been identified.

Keywords: Roadside Trees, Urban Plantations, Exotic Trees, Raipur, Atal Nagar.

Date of Submission: 22-05-2019

Date of acceptance: 08-06-2019

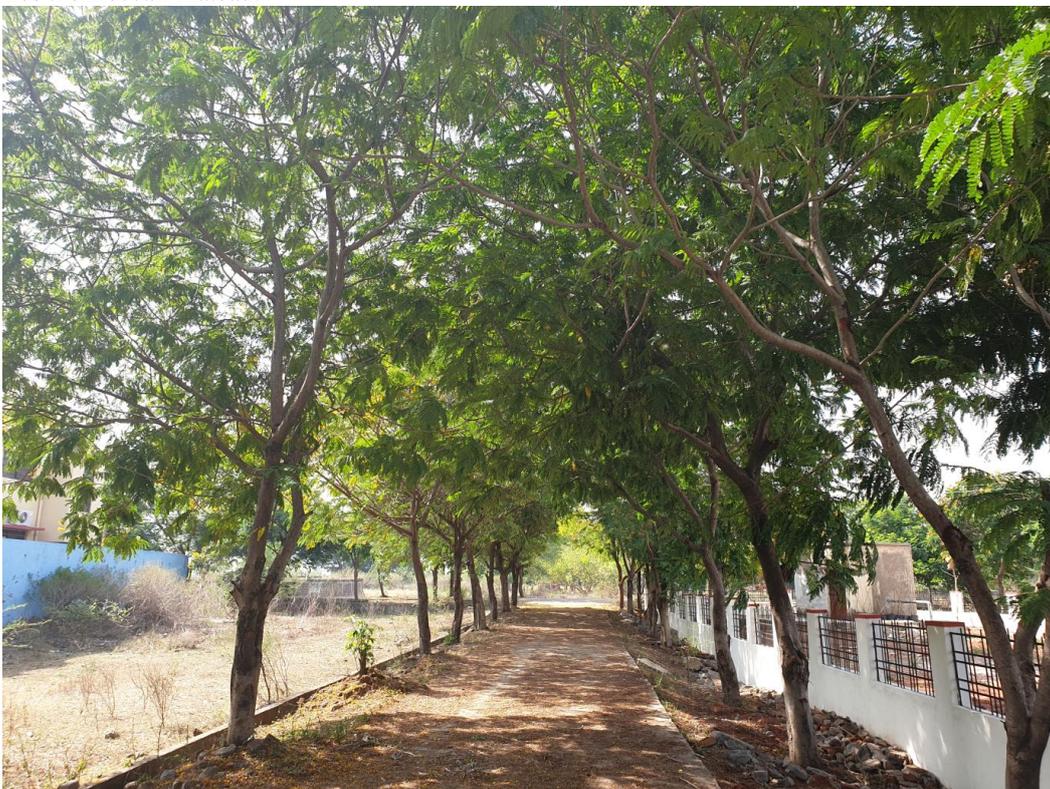
I. Introduction

Raipur is the capital city of Chhattisgarh state. It is also the largest city of the state. It was formerly a part of Madhya Pradesh before the state of Chhattisgarh was formed on 1 November 2000. It has a widely diverse population from all over the country. On the industrial prospects, it has seen an exponential growth over the years. With a strong presence of international brands and prominent global automobile companies, Raipur has emerged as a major business hub in the central India.



Roadside Trees in Naya Raipur

Raipur is located near the centre of a large plain, sometimes referred to as the "rice bowl of India", where hundreds of varieties of rice are grown. The Mahanadi River flows to the east of the city of Raipur, and the southern side has dense forests. The Maikal Hills rise on the north-west of Raipur; on the north, the land rises and merges with the Chota Nagpur Plateau, which extends north-east across Jharkhand state. On the south of Raipur lies the Deccan Plateau.



Roadside Trees in Naya Raipur

Raipur has a tropical wet and dry climate, temperatures remain moderate throughout the year, except from March to June, which can be extremely hot. The temperature in April–May sometimes rises above 48 °C . These summer months also have dry and hot winds. In summers, the temperature can also go up to 50 °C. The city receives about 1,300 millimetres of rain, mostly in the monsoon season from late June to early October. Winters last from November to January and are mild, although lows can fall to 5 °C making it reasonably cold..

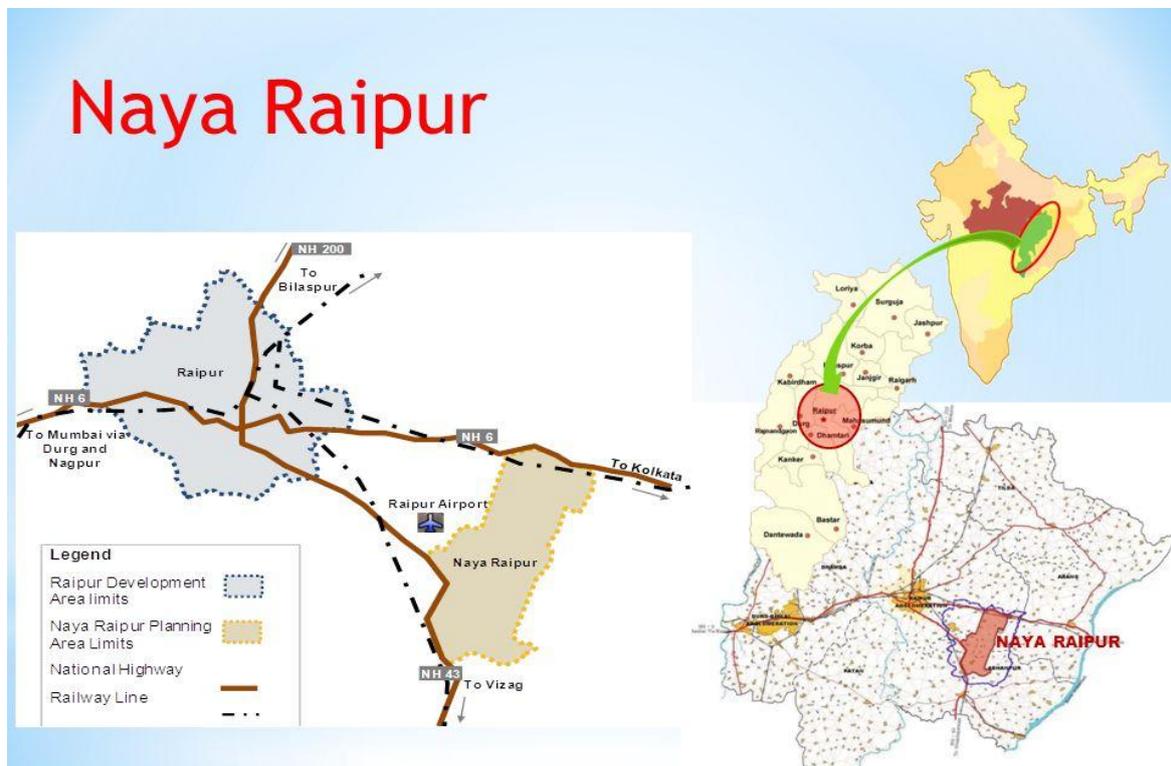


Roadside Trees in Naya Raipur

Soil of Raipur city is base deficient, reddish, brown lateritic *morum* with ferruginous *kanker*. The rocks beneath the surface belongs to *Cuddapah* system mainly consist of lime stone. This is covered by lateritic and clayey soils. Locally soils are classified into four types known as *Kanhar*, *Dorsa*, *Matasi*, and *Kachar*. *Bhatha* lands have an average pH of 6.5 to 7.5 which is conducive for agricultural activities. Raipur is also rich in mineral resources.

The city of Raipur has the population of 30 lakhs. As of 2011 Census it is the most populous district of Chhattisgarh (out of 27).

The study area of the research includes Municipal Corporation area admeasuring 160 square km along with the territory of Atal Nagar, Naya Raipur.



Naya Raipur, officially known as Atal Nagar, is the new Capital City of Chhattisgarh. It has replaced Raipur as the capital city of Chhattisgarh. "Mantralay", the states's administrative body is situated here. The city is located between National Highways NH-53 and NH-30, about 17 km south-east of the city Raipur; Swami Vivekananda Airport separates Raipur and Naya Raipur.

In Atal Nagar, Naya Raipur, about half of the total acquired land is being used for public facilities; 23% of the land is reserved for government and educational institutions; and 30% of the land is used for residential and economical purposes. The city is envisaged to accommodate about 560,000 people by phase III, i.e., within 2031 as per the Master Development Plan prepared by Naya Raipur Development Authority now Atal Nagar Vikas Pradhikaran. Provisions have been made for its expansion and to upgrade infrastructure in the future.

A comprehensive exercise was undertaken to find a perfect location for the city. An imaginary circle of 50 km radius was drawn around Raipur and this massive area was divided into four quadrants.

Each quadrant was analysed in context of regional development, existing development, climatic factors, flora and fauna, water resources, transport network etc. and the efforts yielded the present site southeast of Raipur at about 15 km distance, close to Mana Airport.

Naya Raipur is a 'green city' in every sense of the term. Large areas have been brought under tree plantation, arrangements have been made for water conservation and waste water recycling, and non-conventional energy resources are being used to the maximum. Most of the plantation was done under Social forestry programmes. The term, social forestry, was first used in 1976 by The National Commission on Agriculture, Government of India. It was then that India embarked upon the social forestry project with the aim of taking the pressure off currently existing forests by planting trees on all unused and fallow land. Social forestry is basically for the people by the people and of the people approach. It is therefore a democratic approach of forest conservation and usage.

The Indian government is trying to increase forest areas that are close to human settlement and have been degraded over the years due to human activities needed to be afforested.

Social forestry also aims at raising plantations by the common man so as to meet the growing demand for timber, fuel wood, fodder, etc., thereby reducing pressure on traditional forest areas. This concept of village forests to meet the needs of the rural people is not new. It has existed through the centuries all over the country, but it is now being given a new character.

With the introduction of this scheme, the government formally recognised the local communities' rights to forest resources, and is now encouraging rural participation in the management of natural resources. Through the social forestry scheme, the government has involved community participation, as part of a drive towards afforestation, and rehabilitating the degraded forest and common lands.



Roadside Trees in Old Airport Road

Method of Field Survey:

Field survey was conducted during the period of 2014-2015 all the sites were visited for plant collection during summer, rainy and winter seasons, when most of the plants were found in vegetative growth or in flowering state. Samples from trees were collected for preparation of herbarium and identification. Various information about trees were noted in the field diary. During the field survey habitat of trees was observed and photographs of the trees were taken in field and as well as in the labs. A careful and planned exploration of the study area was done to record all the species growing in the area. The collected tree species were identified with the help of standard published literatures. Flora of Hooker (1872), Flora of Presidency of Madras, Gamble (1881), Flora of Raipur, Durg and Rajnandgaon, Verma, et al (1985), Flora of Bilaspur, Panigrahi and Moorty (1989), The Flora of Madhya Pradesh, Verma, (1993). Flora of Delhi J.K Maheshwari (1950), Flora of Bhopal M.Oomachan(1977) .

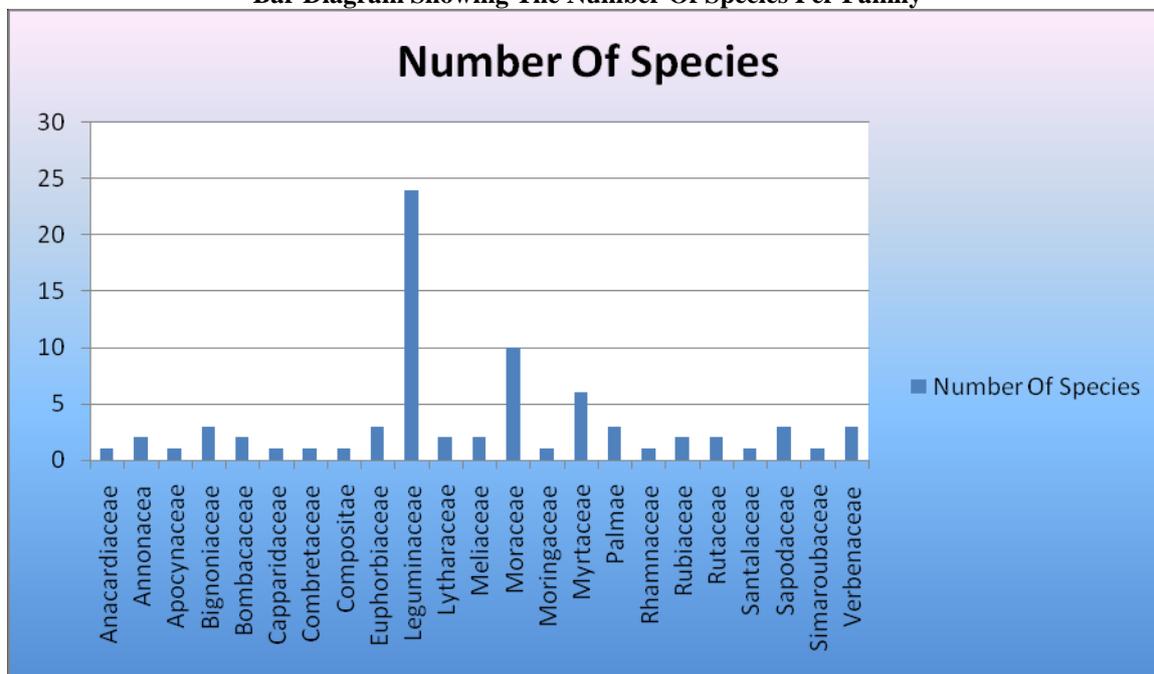
The names of all the identified trees were arranged alphabetically by botanical name and followed by their author citation, vernacular name and family.

LIST OF TREES PRESENT ON THE ROAD SIDE OF RAIPUR CITY.

| S.No | Botanical Name | Family | Common Name |
|------|--|------------------|-------------------|
| 1. | <i>Acacia leucophloea</i> Roxb. | Mimosoidaceae | Ronjh |
| 2. | <i>Acacia nilotica</i> | Mimosoidaceae | Babul |
| 3. | <i>Acacia auriculiformis</i> A.Cunn. | Mimosoidaceae | Australian Babool |
| 4. | <i>Aegle marmelos</i> L. | Rutaceae | Bel |
| 5. | <i>Ailanthus excelsa</i> Roxb. | Simaroubaceae | Mahaneem |
| 6. | <i>Albizia lebbek</i> L. | Mimosoidaceae | Siris |
| 7. | <i>Albizia procera</i> L. | Mimosoidaceae | Siris Safed |
| 8. | <i>Alstonia scholaris</i> R. | Apocynaceae | Chhatim |
| 9. | <i>Annona reticulate</i> R. | Annonaceae | Ramphal |
| 10. | <i>Annona squamosa</i> L. | Annonacea | Sheetafal |
| 11. | <i>Anthocephalus cadamba</i> Miq. | Rubiaceae | Kadam |
| 12. | <i>Artocarpus heterophyllus</i> L. | Moraceae | Kattthal |
| 13. | <i>Artocarpus lacucha</i> L. | Moraceae | Badhal |
| 14. | <i>Azadirachta indica</i> A.Juss. | Meliaceae | Neem |
| 15. | <i>Bahunia purpurea</i> L. | Caesalpinioideae | Kachnar |
| 16. | <i>Bauhinia veriegata</i> L. | Caesalpinioideae | Kachnar |
| 17. | <i>Bombax malabarica</i> L. | Bombacaceae | Semal |
| 18. | <i>Butea monosperma</i> Lamk. | Papilionaceae | Chhoela |
| 19. | <i>Caesalpinia bonducella</i> L. | Leguminaceae | Flem |
| 20. | <i>Careya arborea</i> Roxb. | Myrtaceae | Kumahi |
| 21. | <i>Carthamus tinctorius</i> | Compositae | Kusum |
| 22. | <i>Cartivia adansonii</i> | Capparidaceae | Barna |
| 23. | <i>Caryota urens</i> | Palmae | Salfi |
| 24. | <i>Cassia fistula</i> l. | Caesalpinioideae | Amaltas |
| 25. | <i>Ceiba pentandra</i> | Bombacaceae | Kapok |
| 26. | <i>Cordia mixa</i> Auct | Rutaceae | Lasoda |
| 27. | <i>Dalbergia sisso</i> Roxb. | Papilionaceae | Shisham |
| 28. | <i>Delonix regia</i> Bojer | Caesalpinioideae | Gulmohar |
| 29. | <i>Diospyrus melanoxylon</i> Roxb. | Verbenaceae | Tendu |
| 30. | <i>Drypetes roxburghii</i> | Euphorbiaceae | Putranjivika |
| 31. | <i>Eucalyptus grandis</i> | Myrtaceae | Neilgiri |
| 32. | <i>Eugenia jambolana</i> | Myrtaceae | Jamun |
| 33. | <i>Ficus bengalensis</i> <i>krishnae</i> L. | Moraceae | Bargad |
| 34. | <i>Ficus bengalensis</i> L. | Moraceae | Bargad |
| 35. | <i>Ficus elastic</i> | Moraceae | Rubber |
| 36. | <i>Ficus glomerata</i> Roxb | Moraceae | Gular |
| 37. | <i>Ficus infectoria</i> Roxb | Moraceae | Pakri |
| 38. | <i>Ficus microcarpa</i> L. | Moraceae | Laurel fig |
| 39. | <i>Ficus virens</i> Dryander | Moraceae | Pakar |
| 40. | <i>Ficus religiosa</i> L. | Moraceae | Pipal |
| 41. | <i>Gardinia latifolia</i> Ait | Rubiaceae | Piprol |
| 42. | <i>Gmelina arborea</i> Roxb | Verbenaceae | Khamer |
| 43. | <i>Hardwickia binata</i> Roxb | Leguminaceae | Anjan |
| 44. | <i>Kigelia pinnata</i> Lam.Benth | Bignoniaceae | Sasuage tree |
| 45. | <i>Lagestoromea perviflora</i> Roxb | Lytharaceae | Nana |
| 46. | <i>Lagestoromea speciosa</i> Roxb | Lytharaceae | jarul |
| 47. | <i>Laucaenea leucocephala</i> | Mimosoidaceae | Subabul |
| 48. | <i>Madhuca indica</i> L. | Sapotaceae | Mahua |
| 49. | <i>Mangifera indica</i> L. | Anacardiaceae | Mango |
| 50. | <i>Melia azadirachta</i> L. | Meliaceae | Bachain |
| 51. | <i>Mimusops elengi</i> | Sapotaceae | Maulshri |
| 52. | <i>Moringa oelefera</i> | Moringaceae | Munga |
| 53. | <i>Morus alba</i> | Moraceae | Sahetut |
| 54. | <i>Peltophorum ferrugineum</i> D.C., Baker ex k.Heyne | Leguminaceae | Copper pod |
| 55. | <i>Phoenix sylvestris</i> L. | Palmae | Date plam |
| 56. | <i>Phyllanthus officinalis</i> Gaertn. | Euphorbiaceae | Amla |
| 57. | <i>Pithecellobium dulce</i> | Mimosoidaceae | Jungle jalebi |
| 58. | <i>Polyalthia longifolia</i> Sonner. | Annonaceae | Druping Ashoka |
| 59. | <i>Pongamia glabra</i> L.Pierre | Papilionaceae | Karanj |
| 60. | <i>Psidium guajava</i> L. | Myrtaceae | Guava |
| 61. | <i>Pterocarpus marsupium</i> Roxb. | Leguminaceae | Beejasal |
| 62. | <i>Putranjiva roxburghii</i> | Euphorbiaceae | Putrajeevika |
| 63. | <i>Roystonea regia</i> | Palmae | Royal palm |
| 64. | <i>Santalum album</i> L. | Santalaceae | Chandan |
| 65. | <i>Sapindus trifoliata</i> L. | Sapindaceae | Reetha |
| 66. | <i>Saraca ashoka</i> . de Wilde | Sapotaceae | Sita Ashok |
| 67. | <i>Sesbania sesban</i> | Papilionaceae | Siris |

| | | | |
|-----|----------------------------------|------------------|--------------------|
| 68. | <i>Spathodea campanulata</i> | Bignoniaceae | African tulip tree |
| 69. | <i>Tabebuia rosea</i> | Bignoniaceae | Trumpet tree |
| 70. | <i>Tamirindus indica L.</i> | Caesalpinioideae | Imali |
| 71. | <i>Tectona grandis L.</i> | Verbenaceae | Sagun |
| 72. | <i>Terminalia arjunaRoxb.</i> | Combretaceae | Arjun |
| 73. | <i>Ziziphus mauritiana Lamk.</i> | Rhamnaceae | Ber |

Bar Diagram Showing The Number Of Species Per Family



Delonix regia Bojer



Cassia fistula l



Spathodea campanulata



Bauhinia veriegata L.



Lagestoromea speciosa Roxb

The study area is divided into four regions - north, east, south and west. Each road of Raipur city and Atal Nagar like Gaurav Path, G.E. Road, NH35, Old Airport Road, New Airport Road, Naya Raipur Roads, Ekam Marg were visited every fortnightly fruit, flowers, twig was collected. Photographs were taken and flowering season was noted of each tree. The study area includes planted trees, wild trees, exotic trees and cultivated trees. The identification, alphabetical arrangement of trees in tabulated form was done. Identification was done with the help of Bentham and Hooker flora and Flora Raipur, Durg and Rajnandgaon³.

Observation and Result :

Road side trees were observed, identified and categorized as per their classification. The trees were categorized into the subheads of endemic, exotic, wild and common. Their family was identified and listed accordingly.

Benefits of road side planting:

1. Reduced soil erosion: holds soils in place.
2. Remove dust and other pollutants from the air, protecting crops and road-side communities.

³D.M.Verma, P.C.Pant and M.I.Hanfi, Botanical Survey of India (1984).

3. Wind break
4. Flood control: slow and absorb road run-off.
5. Improved water quality by vegetation's ability to trap sediment and increase water infiltration.
6. Increasing road stability: vegetation helps to lower local water tables that may affect the road formation and pavement.
7. Safety: reinforcing road alignment, serving as crash barriers, protecting view planes and reducing wind speeds.
8. Carbon dioxide sequestration.
9. Defence against invasive weeds.
10. Provide important pollinator habitat.
11. Provide shade and keep the road cool for road users.
12. Absorbs sound, thus helps in reducing sound pollution.

Tree species shall preferably be:

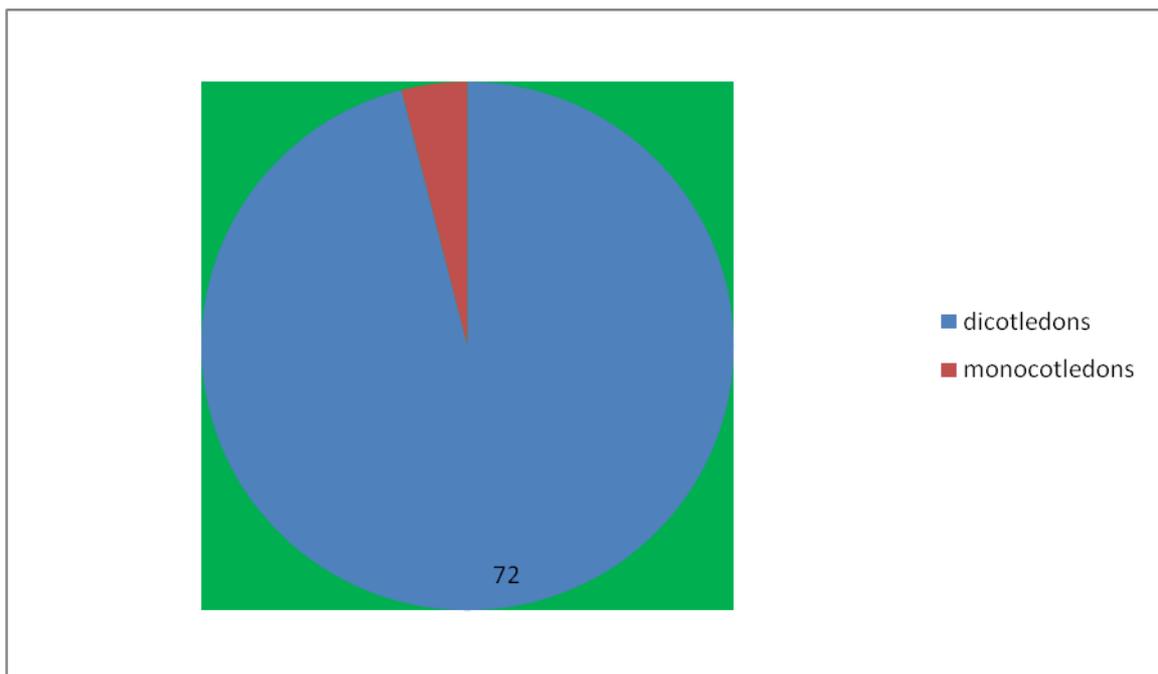
- Unpalatable
- Evergreen Or Remain Green Over Most Of The Year
- Shall Have A Crown Architecture With More Horizontal Than Vertical Extension
- Tolerant Of Seasonal Drought And Insect And Pest Harms
- Deep Rooted To Resist Wind Power
- Shall Not Be Invasive
- Fast Growing
- Shall Have One Or More Of Social And Economic Values Such As Medicinal, Food, Fuel Wood, Feed, Shade, Etc .

II. Discussion and conclusion

Trees found in road side of Raipur region were predominantly species of dry deciduous forest type. Family which has maximum no. species is leguminaceae. Endemic species like *Hardwickia binata* are found here. Exotic species *Santalum album*, *Tabebuia rosea* *Alianthus excela* *Mahaneem*, *Spathodea campanulata*, *Peiltaphorum ferrugineum* are found here.

Anacardiaceae 1 species, Annonaceae 2 species, Apocynaceae 1 species, Bignoniaceae 3 species, Bombacaeae 2 species, Capparidaceae 1 species, Combretaceae 1 species, Compositae 1 species, Euphorbeaceae 3 species, Lytharaceae 2 species, Meliaceae 2 species,

Moraceae 10 species, Moringaceae 1 species, Myrtaceae 6 species, palmae 3 species, Rhamnaceae 1 species, Rubiaceae 2 species, santalaceae 1 species, Sapotaceae 3 species, Simaroubaceae 1 species, Leguminaceae 24 species, Rutaceae 2 species, verbenaceae 3 species was present.



PIE DIAGRAM SHOWING NUMBER OF MONOCOT AND DICOT SPECIES.

Acknowledgement

We are thankful to publisher for publishing my research paper and Shri Haresh C Tiwari (I.F.S.) for guiding us and giving his valuable inputs. We are thankful to ANIMESH TIWARI his technical support. We express our deep sense of gratitude to all the informants who freely discussed during the field survey, without their cooperation, this would not have been possible.

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Tiwari Shikha. " "Road Side Trees of Raipur City"." IOSR Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT) 13.6 (2019): 01-10.