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DOCUMENTATION OF MULTIPURPOSE AVENUE TREE PLANTATION OF URBAN ROADSIDE OF NATIONAL HIGHWAY 930 PURUR TO DALLIRAJHARA DISTT- BALOD (C.G.)

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ABSTRACT: -

An avenue tree is the row of tree's grown on both sides of roads. Avenue tree's in ecosystem play a very significant role in environment protection by purifying air and noise pollutants obtaining, fodder, fuel, timber wood and fruits handling many other function. Avenue tree's grown on many other objects like as shade and shelter, ornamentally and socio-economically. They play very essential role in every fields and provided ecosystem equilibrium.

Present documentation represented list of trees grown in road sides in National Highway 930 Purur to Dallirajhara (Distance- 60 km) Distt – Balod (C.G.). The road lines are very crowded and pollutant's (air and noise) in which avenue trees are very essential role played for remove pollution and provided fresh air, shade and shelter and various socio economically use's. The present survey conducted during Aug 2017 to Oct 2018 in which observed total number of 78 avenue trees were recorded in road sides of National Highway in which 71 tree's belongs to Dicotyledons and 07 tree's belongs Monocotyledon's respectively. In during the listing of maximum number of trees belong to family Fabaceaeand other respectively. The present paper based on plant's flowering type, socio economic importance and their role of ecosystem.

KEY WORDS: -Avenue tree, ecosystem equilibrium, socio-economic, National Highway.

INTRODUCTION: -

India has the world's second largest road network after U.S.A. out of 46.80 lakh km long road network. National highway account for 1 lakh km stretch, which passes through urban, rural and forest areas of the country. Clearance of forest and tree feeling activities are inevitable process of highway development. Which result in large scale environmental degradation in form of biodiversity loss and release of carbon stocked in trees. Although to counter the losses highway projects are bundled with median and avenue plantations but they are seldom equivalent to the natural ecosystem existing before the development. The situation becomes critical with incessant movement of vehicle on these roads contributily further in release of green house gases and other suspended particulate matters pollutants released in air by vehicles travels to further areas, posing an imminent health treat for humans as well as wild life. Today all that reason or problems are very critical so required to promote plantation of avenue trees along with street side, road side and various National Highway. Present study this documentation enhances the knowledge of all kind problems and they treat and provide very comfortable and essential environment for our healthy life.

Presently world facing high problem environment and they ultimately disturb the eco-system.

The un ornamented reason behind that global warming, flood, droughts, toxic gases effect. Every single tree play multiple functions in the biodiversity. In recent year the acceleration of carbon di oxide in urban cities is not only directly connected with population but also amplifying the vehicular traffic followed by the industrial pollution. Avenue tree only is solution to protect the environment from this problem (Mulani R.M. et all 2015).Roadside Avenue tree planting can make significant improvements to the quality of roads and the environment and can protect key natural resources, where vegetation is essential in binding the soil with organic matter that aids in enhanced infiltration and water retention in the soil. Road corridors can be a focus area for the restoration of vegetation cover, as vegetation supports many additional benefits, such as trapping dust and reducing run-off flows. Several studies indicate that the benefits accumulated from roadside tree planting include better soil formation by shedding dead leaves, increased water quality by reducing sediment flow, reduced erosion, road beautification, flood control as the trees slow

and absorb road runoff, wind breaking, providing important pollinator habitats, improving peoples' health, and protecting crops (Steenbergen et al., 2019; Perez et al., 2016).

MATERIALS AND METHOD: -

Present field study was done at National Highway 930 Purur to Dallirajhara district of Balod Chhattisgarh, which is approximate 58 km in stretch. These road side study divided in three sectioned/ zones ie, zone-Ⅰ, zone-Ⅱ and zone-Ⅲ. Balod is located at 20.73°N, 81.2°E. It has an average elevation of 324 metres (1063 feet). Balod is a town in banks of river Tandula and a Nagarpalika in Balod district in the state of Chhattisgarh, India. Balod is 44 km from Dhamtari and 58 km from Durg. Balod has one college, one court, one CHC (Community Health Center), and a jail. Medical facilities are good in Balod. There are two Dams nearby Tandula and Aadmabaad built on rivers sukha and Tandula in 1912. On 1 January 2012 it was notified as Civil District though revenue district was declared from 10 January 2012. Balod became the 27th district of Chhattisgarh. There are several religious temples nearby town; particularly Ganga Maiya temple and Shiyadevi temple hold great religious value for the townsfolk. There are only one National Highway 930(58 km) are started to NH 30 from Purur and passes to hole Balod district at tehsil Gurur, Balod, and Doundi. This Highway across the possess Balod District Chhattisgarh and it enter at state Maharashtra.

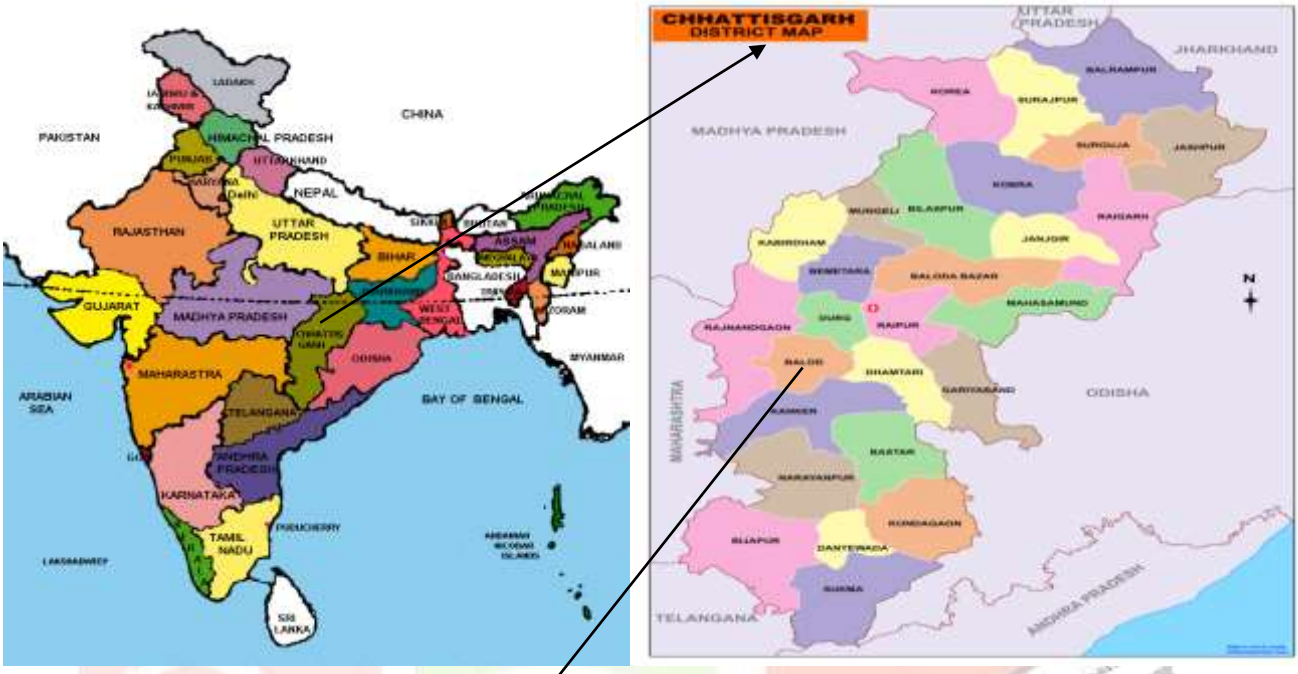

Figure:1 Showing Iindia map and Chhattisgarh state.

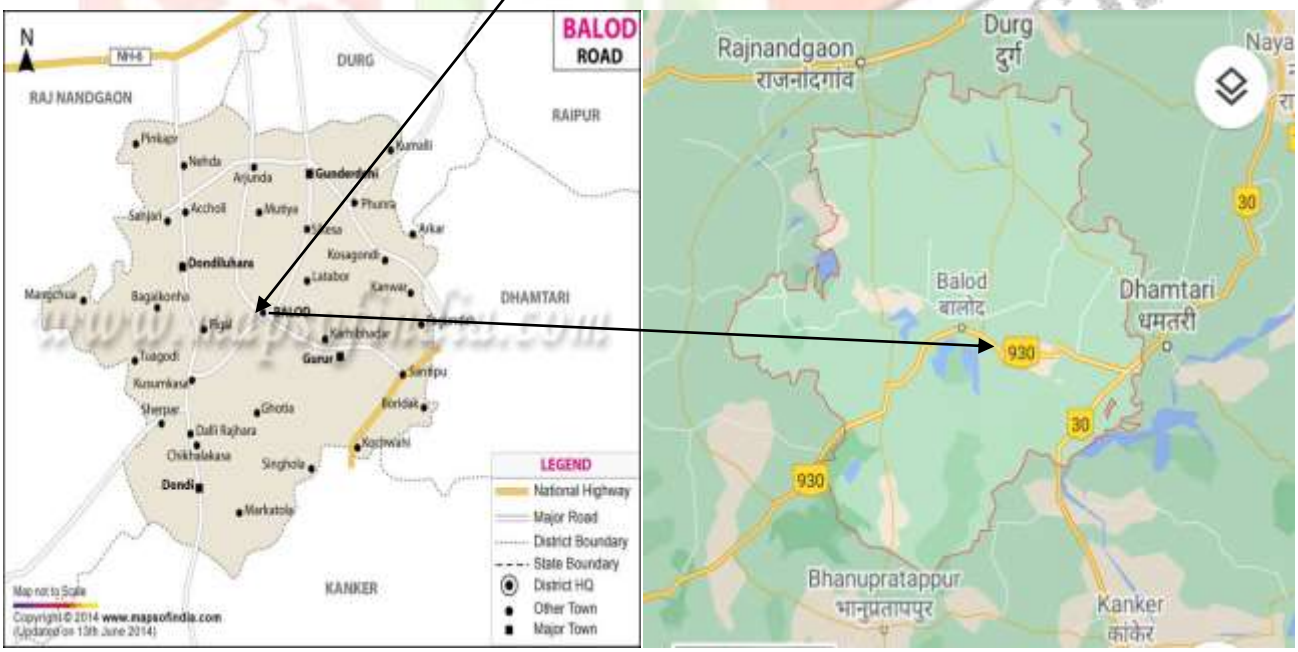

Figure:2 Showing detailed location in survey area of National Highway 930 Purur to Dallirajhara Distt Balod C.G.

Selections of study area – Present documentation field survey are conducted during August 2017 to October 2018 at all the road sides of National Highway 930 were visited for plant collection during summer, rainy and winter seasons. Surveyed Highway (58km) is divided in three zones 1, 2, and 3.All these zone 30 villages (Table-1) were recorded in field study.

Zone-1st of divided in Purur to Gurur about 11 km distance in which six(6) Purur, Kumharkhan, Kaneri, Kuliya, Bohardih and Kolihamar villages were recorded in the field study. These zone avenue tree are grow frequently diversified line to line like street road side tree, all villages are located in these road side along with and avenue tree are grow in all uses for local villages people like shelter, ornamental, shade, aesthetic, pollution control and street air purifier.

Zone-2nd are divided in Gurur to Balod about 26 km distance in which fifteen (15) Gurur, Tarri, Bharda, Dhanora bataliyan, Karkabhat, Karhibhadar, Kannewada, Sankra bangle, Sankra, Jamurva, Jagtara, Dewarbhath, Pakurbhath, Jhalmal and sivani villages were recorded in the field study. These zones are also street like road. Highway posses all among the villages and avenue trees grow in roadside frequently for all commercial and daily uses of local peoples.

Zone-3rd are divided in Balod to Manpur chowk Dallirajhara about 21 km distance in which nine (9) Balod, Jurripara, Danitola, Gujra, Kusumkasa, Armurkasa, Pathratola, Khmahartola and Manpur chock Dallirajhara villages were documented in the field. Balod is distt capital of district and these situated in center of National Highway 93. Zone-3rd is dance vegetation and cover highest forest area. These zones an Avenue trees are very much frequently and highly distributed in road side and other areas, most avenue trees are listed in this area as a forest tree.

Table-1: Table showing the total no. of villages is recorded at both road side of National Highway 930 Purur to Manpur chowk Dallirajhara C.G.

S.No.	Zone	Name of village	Total Village	Distance in Km
01.	Zone- Ⅰ (Purur to Gurur)	Purur	06	11
		Kumharkhan		
		Kanrei		
		Kuliya		
		Bohardih		
		Kolihamar		
02.	Zone-Ⅱ (Gurur to Balod)	Gurur	15	26
		Tarri		
		Bharda		
		Dhanora Bataliyan		
		Karkabhath		
		Karhibhadar		
		Kannewada		
		Sankra Bangla		
		Sankra		
		Jamruva		
		Jagtara		
		Devarbhath		
		Pakurbhath		
		Jhalmala		
		Sivani		
03.	Zone-Ⅲ (Balod to Manpur Chouck Dallirajhara)	Balod	09	21
		Jurripara		
		Danitola		
		Gujra		
		Kusumkasa		
		Armurkasa		
		Pathratola		
		Khmahartola		
		Manpur chouk Dallirajhara		
Total			= 30	= 58

I. **Questionnaires survey-** The development of questionnaires was based on preliminary studies conducted by me. The questionnaires for assessing public preference for management of road side trees were divided three questionnaires / section (Hasan Ramly et.al 2016)-

a) 1st section of the diversity, abundance and demographic information of all road side avenue trees.
b) 2nd section to covers the importance and uses of roadside tree management by selected local authorities.
c) Section 3rdwhich contains highlights public opinion and awareness toward road side avenue tree management.

II. **Data analysis-**Survey are done in three zones at National Highway 930 Purur to Dallirajhara for 1 years from August 2017 to October 2018 in summer, rainy and winter seasons. During the surveyed total number of trees of each zone are identified and recorded. Most of the plants were found in vegetative growth or flowering state. Samples from trees were collected photographs of herbarium and identification various information about tree were noted in the field diary. During the field survey habitat of 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 data were identified with the help of standard published literatures, flora of Hooker (1872), flora of presidency of Madras, Gamble (1881), 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), and Flora of Raipur, etc (Tiwari Sikha et,al 2019) and all the plants were identified and arranged by botanical name followed their author critation, vernacular name and family.

RESULTS AND DISCUSSION:-

In present documentation all plant species collect, photography and identified in various zone of road side of National Highway 930 during Aug 2017 to Oct 2018 at all seasons and listed by botanical name, Family and their vernacular name. In this documentation in field total no. of 91 plant species avenue tree are identified and recorded.Most species are predominantly of dry deciduous forest type, which belongs to 34 families. In which 85 plant species are belongs to dicotyledons and 06 are monocotyledons (Table-2). Anacardiaceae-3, Annonaceae-3, Apocynaceae-6, Araliaceae-1, Arecaceae-4, Asclepiadaceae-1, Asteraceae-1, Bixaceae-1, Boraginaceae-1, Cannaceae-1, Casuaraniaceae-1, Combretaceae-5, Dipterocarpaceae-1, Ebenaceae-1, Euphorbiaceae-3, Fabaceae-19, Lamiaceae-3, Lythraceae-2, Magnoliaceae-1, Malvaceae-2, Meliaceae-2, Menispermaceae-2, Moraceae-5, Moringaceae-1, Myrtaceae-4, Nyctaginaceae-1, Oleaceae-1, Poaceae-1, Rhamnaceae-1, Rubiaceae-3, Rutaceae-3, Sapotaceae-1, Solanaceae3 and Verbenaceae-3(Total 91 plant species 34 family) (Table-3)are found in survey area.

These field Dominant species *Acasia nilotica* L., *Pongamiapinnata*L., *Terminalia ellipticaWilld., Terminalia arjuna* (Roxb.), *Butea monosperma*(Lam.),*Azadirecta indica* L., *Chloroxylonsweitenia*D.C., *Diospyros melonxylon*Roxb., *Legerstroemiaparviflora*Roxb., *Osimumbasillicum*Linn., *Leucaena leucocephala* (Lam.), *Terminalia chebula* Retz.and*Lantana Camara* L. are found. Endemic avenue plant species are *Hardwickiabinata*Roxb. *Cordia sebestena*L, *Bixaorellana*L.and*Bauhiniapurpurea*L. and exotic species *Cocas nucifera*L.*Anthocephaluscadamba*(Roxb.)*Parkinsonia aculeate* L.*Micheliachampaca*L. Baill, *Madhuca indica* J.F. Gmel *Mangifera indica* L. etc found here in this field. In that family Fabaceae highest no. of plant species is observed and other hand Araliaceae, Bixaceae, Magnoliaceae, Cannaceae and Casuarinaceae are lowest no.of plants recorded. The all reported species play very valuable role in the maintance of ecosystem, pollution purifier, shade, shelter, ornamental, medicinal and aesthetic value.This paper main aspectof paper to Effort Avenue tree plantation and conserved for all beneficial purpose.

Table-2: Showing Avenue plant trees identify and recorded in fields of National Highway 930 Purur to Manpur chowk Dallirajhara C.G.

S.No.	Botanical Name	Family	Common / Vernacular name
1	*Acasia arabica* L.	Fabaceae	Babool safed
2	*Acasia auriculiformis* A. Cunn ex.Benth	Fabaceae	Australian Babool
3	*Acasia nilotica* L.	Fabaceae	Babool kala
4	*Aegal marmelos* Correa.	Rutaceae	Bel
5	*Alstonia scholaris* L.(R.Br.)	Apocynaceae	Satparnee
6	*Annona reticulate* L.	Annonaceae	Ramphal
7	*Annona squamosa* L.	Annonaceae	Sita phal
8	*Anthocephalus cadamba* (Roxb.)	Rubiaceae	kadam ped
9	*Artocarpus heterophyllus* Lam.	Moraceae	Kathal
10	*Azadirecta indica* L.	Meliaceae	Neem
11	*Bauhinia purpurea* L.	Fabaceae	Kachnar
12	*Bixa orellana* L.	Bixaceae	Sinduri
13	*Bombax cieba* L.	Malvaceae	Semar
14	*Bouganvillea spectabilis* willd.	Nyctaginaceae	Kagaj ful
15	*Buchanania lanzan* Spreng	Anacardiaceae	Char
16	*Butea monospermum* (Lam.)	Fabaceae	Parsa
17	*Caesalpinia pulcharrima* L.(SW.)	Fabaceae	Peacock flower
18	*Callistemon lanceolatus* R. Br.	Myrtaceae	Bottel brush
19	*Calotropis procera* (Aiton.) W.	Asclepiadaceae	Fudhar
20	*Casia fistula* L.	Fabaceae	Amlatash
21	*Canna indica* L.	Cannaceae	Canna
22	*Casuarina equisetifolia* L.	Casuaraniaceae	Australian pine tree
23	*Chloroxylon swietenia* D.c.	Rutaceae	Bhirha
24	*Cissampelos pareira* L.	Menispermaceae	Velvet leaf
25	*Cocas nucifera* L.	Arecaceae	Nariyal
26	*Cordia sebestena* L.	Boraginaceae	Lal lasora
27	*Delbergia sissoo* (Roxb.)	Fabaceae	Sheesham
28	*Delonix regia* (Boj.ex Hook.)	Fabaceae	Gulmohar
29	*Dendrocalamus strictus* Roxb. Nees	Poaceae	Bans
30	*Dhatura alba* L.	Solanaceae	Dhatura safed

31	*Dhatura metal* L.	Solanaceae	Dhatura kala
32	*Diospyros melonxylon* Roxb.	Ebenaceae	Tendu
33	*Duranta repens* L.	Verbenaceae	Duranta
34	*Emblica officinalis* Linn.	Euphorbiaceae	Amla
35	*Eucalyptus citriodora* Hook.	Myrtaceae	Nilgiri
36	*Ficus benghalensis* L.	Moraceae	Bargad
37	*Ficus racemosa* L.	Moraceae	Doomar
38	*Ficus religiosa* L.	Moraceae	Peepal
39	*Gmelina arborea* Roxb.	Lamiaceae	Khmahar
40	*Haldinia cordifolia* Roxb.	Rubiaceae	Haldu
41	*Hardwickia Binata* Roxb.	Fabaceae	Anjan
42	*Hibisicus rosa sinansis* L.	Malvaceae	Gudhal
43	*Holarrhena pubescens*Wall. Ex G.Don	Apocynaceae	Safed koriya
44	*Ixora coccinea* L.	Rubiaceae	Ixora
45	*Jatropha curcus* L.	Euphorbiaceae	Baghranda
46	*Lannea coromondelica* (Houtt.) Merr.	Anacardiaceae	Indian ash tree
47	*Lantana camara* L.	Verbenaceae	Machhimudi
48	*Lantana indica* Roxb.	Verbenaceae	Machhimudi
49	*Lawsonia inermis* Linn.	Lythraceae	Mehndi
50	*Legerstroemia parviflora* Roxb.	Lythraceae	Senha
51	*Leucaena leucocephala* (Lam.)	Fabaceae	So babool
52	*Livistona chinensis* (Jacq.)R.Br. Ex	Arecaceae	Fen palm
53	*Madhuca indica* J.F. Gmel	Sapotaceae	Mahuwa
54	*Mangifera indica* L.	Anacardiaceae	Aam ped
55	*Melia azedarach* L.	Meliaceae	Mahaneem
56	*Michelia champaca* L. Baill	Magnoliaceae	Champa
57	*Moringa oleifera* Lam.	Moringaceae	Munga
58	*Morus alba* L.	Moraceae	Shah toot
59	*Murraya koenigii* (L.) Sprengle	Rutaceae	Curry patti
60	*Nerium indicum* L.	Apocynaceae	Kaner safed
61	*Nerium oleander* L.	Apocynaceae	Kaner lal
62	*Nyctanthus arbortristis* L.	Oleaceae	Parijat
63	*Osimum basillicum* Linn.	Lamiaceae	Vantulsha
64	*Parkia biglandulosa* G.A.W.Arnot	Fabaceae	Badminton ball tree
65	*Parkinsonia aculeata* L.	Fabaceae	Barbados flower fence
66	*Peltaphoram pterocarpum* (DC.) K.Heyne	Fabaceae	Yellow flame tree
67	*Phoenix sylvestris* (L.) Roxb.	Arecaceae	Chhind ped
68	*Pithecellobium dulce* (Roxb.)	Fabaceae	Ganga imli
69	*Polyalthia Longifolia* (Sonn.)	Annonaceae	Ashok ped
70	*Pongamia pinnata* L.	Fabaceae	Karanj
71	*Psidium guajava* L.	Myrataceae	Jam
72	*Pterocarpus marsupium* Roxb.	Fabaceae	Beejasar
73	*Ravenala medagascariensis* (Sonn.)	Arecaceae	Palm tree
74	*Ricinus communis* L.	Euphorbiaceae	Arandi
75	*Schefflera actinophylla* (Endl.)Lowry & G.M.Plunket	Araliaceae	Umbrella tree
76	*Senna spectabillis* (DC.)Irwin & Barrenby	Fabaceae	Golden shower
77	*Shorea robusta* Roth.	Dipterocarpaceae	Sal
78	*Syzygium cumini* L.	Myrtaceae	Jamun
79	*Solanum nigrum* L.	Solanaceae	Makoy
80	*Sphaeranthus indicus* Linn.	Asteraceae	Gundru
81	*Taberneamontana divaricata* R.Br.Ex *Roem&Shultz*	Apocynaceae	Chandni
82	*Tamerindus indica* L.	Fabaceae	Imli
83	*Tectona grandis* L.f.	Lamiaceae	Sagoan
84	*Terminalia arjuna* (Roxb.)	Combretaceae	Kahuwa
85	*Terminalia bellerica* Roxb	Combretaceae	Behda
86	*Terminalia catappa* L.	Combretaceae	Badam
87	*Terminalia chebula* Retz.	Combretaceae	Harra
88	*Terminalia elliptica* willd.	Combretaceae	Sajja
89	*Thevitia nerifolia* L.	Apocynaceae	Pili kaner
90	*Tinospora cordifolia* (Thunb.)	Menispermaceae	Giloy
91	*Ziziphus jujuba* Mill.	Rhamnaceae	Ber

Table-3: Showing table family of avenue trees in identified of National Highway 930 Purur to Manpur chowk Dallirajhara C.G.

S.No.	Family	No. of Plant species
1	Anacardiaceae	3
2	Annonaceae	3
3	Apocynaceae	6
4	Araliaceae	1
5	Arecaceae	4
6	Asclepiadaceae	1
7	Asteraceae	1
8	Bixaceae	1
9	Boraginaceae	1
10	Cannaceae	1
11	Casuaraniaceae	1
12	Combretaceae	5
13	Dipterocarpaceae	1
14	Ebenaceae	1
15	Euphorbiaceae	3
16	Fabaceae	19
17	Lamiaceae	3
18	Lythraceae	2
19	Magnoliaceae	1
20	Malvaceae	2
21	Meliaceae	2
22	Menispermaceae	2
23	Moraceae	5
24	Moringaceae	1
25	Myrtaceae	4
26	Nyctaginaceae	1
27	Oleaceae	1
28	Poaceae	1
29	Rhamnaceae	1
30	Rubiaceae	3
31	Rutaceae	3
32	Sapotaceae	1
33	Solanaceae	3
34	Verbenaceae	3
Total No. of Plant Species		= 91

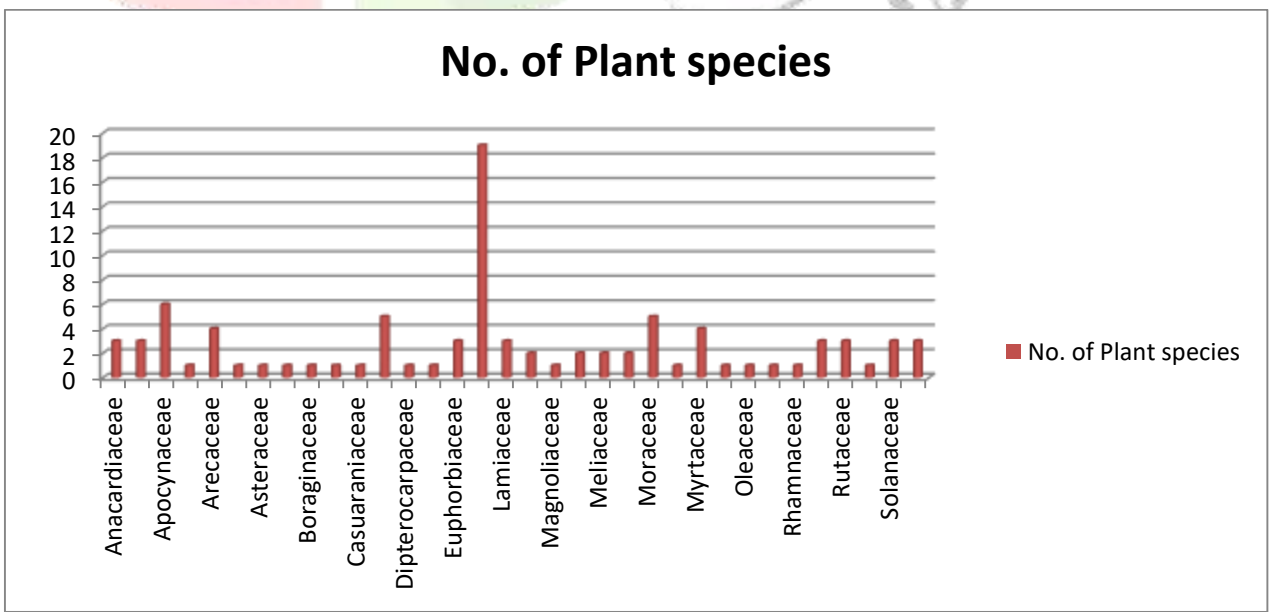

Figure: 3 Showing chart total no. of avenue plant species which belong this family.

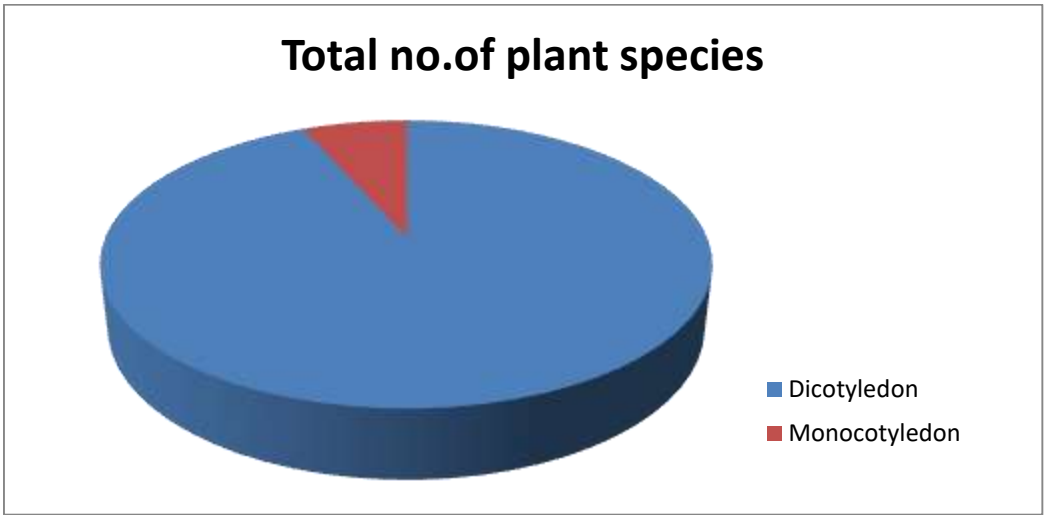

Figure: 4 Showing pie diagram total no. of plants which belongs this group/class.

Figure: 5 Some Avenue tree plant photographs recorded of field area

Fig: 1*Livistona chinensis* (Jacq.)R.Br. Ex

Fig: 2*Polyalthia Longifolia* (Sonn.)

Fig: 3 Acasia nilotica L.

Fig: 4 Tectona grandis L.

Fig: 5 Michalia champaca

Fig: 6*Schefflera actinophylla*(Endl.)Lowry

Fig: 7 Showing road of Pathratola

Fig: 8*Leucaena leucocephala*(Lam.)

CONCLUSION:-

National Highway 930 Purur to Dallirajhara are the most traffic and polluted road lines because the iron raw materials of mines Dallirajhara and Mahamaya are transported to Bhilai steel plant Bhilai by truck and trailer vehicle through these Highway, which avenue trees play very important role to control all road problems like noise and air pollution, it is also provide shade, shelter, ornamental, and aesthetic value. The present research study provide over all status enhance and promote knowledge about in avenue trees diversity, distribution, importance and its conservation.Because "simple small plant require many year and affords to convert in to tree".

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