DIVERSITY AND RESOURCE VALUES OF ANGIOSPERMIC TREES IN AMRAVATI DISTRICT, MAHARASHTRA, INDIA

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Abstract
Trees are pivotal to ecological stability and rural–urban livelihoods in the Vidarbha region of Maharashtra. This study documents the tree flora of Amravati District and evaluates their resource values across forests, agricultural landscapes, and urban/peri-urban greens. During present investigation a rich diversity of 132 tree species belonging to 42 families have been documented. Resource values were categorized as direct (timber, fuelwood, fodder, fruits, medicine, gums/resins, and other non-timber forest products) and indirect (microclimate regulation, soil and water protection, biodiversity support, and carbon storage). Forests retained the richest native assemblages—including Tectona grandis, Anogeissus latifolia, Diospyros melanoxylon, Madhuca longifolia, Terminalia arjuna, and Ficus spp. while farms favored multipurpose and fruit species such as Azadirachta indica, Dalbergia sissoo, Syzygium cumini, Aegle marmelos, and Mangifera indica. Urban plantings were species-poor but functionally important for heat mitigation. We identify pressures (fragmentation, over-extraction, invasive species, fire, and grazing) and recommend mixed-species silviculture, riparian restoration, sustainable non-timber product (NTFP) value chains, and urban tree governance. The documentation provides a policy-relevant baseline for conservation and green-infrastructure planning in Amravati.

Keywords: *Amravati District; tree diversity; resource valuation; ecosystem services; agroforestry; urban greens; NTFPs*

Introduction

Trees are the structural backbone of semi-arid and sub-humid landscapes in central India, delivering provisioning services (timber, fodder, fruits, and medicines) and regulating services (shade cooling, soil conservation, water regulation, and carbon storage). Despite their salience, district-level documentation that integrates floristic diversity with resource valuation is limited. Amravati District, straddling the Satpura foothills and the Wardha–Purna basins, presents a mosaic of dry deciduous forests, riparian corridors, agricultural fields, orchards, and expanding urban settlements. These settings host both native and cultivated angiosperm trees that together shape ecological resilience and livelihoods. This paper documents tree species across major land uses in Amravati and synthesizes their resource values to inform conservation, agroforestry extension, and urban greening. Although Various floristic studies have been carried out in Maharashtra state, but less attention has given to the diversity studies of tree flora in the Vidarbha region of Maharashtra. Dhore MA (2002) made an inventory of the Amravati district's flora with special reference to distribution of tree species. Karthikeyan (2001) conducted research on the Yavatmal district's flora. Tree species in Vidarbha have been documented by Dhore MM et al. (2011). Gadkar PV and Dhore MM (2021) conducted a floristic survey of trees and shrubs in Digras City District Yavatmal, Maharashtra. There is an urgent need to document the region's tree diversity, resource values, and conservation status because there haven't been any recent studies on tree flora, especially in the Amravati district, in ten years. Thus, this is a thorough attempt to catalog the area's tree flora. The objectives is to document tree species composition and structure across forests, farms, and towns; evaluate dominance and regeneration patterns; categorize direct and indirect resource values; and propose management actions relevant to district planning.

Materials and Methods

Study Area: Amravati District lies in eastern Maharashtra (Vidarbha), with a monsoon-dominated climate (roughly 700–1000 mm annual rainfall), hot summers, and cool winters. Upland tracts comprise southern tropical dry deciduous forest with teak (Tectona grandis) and associates; plains support intensive agriculture on Vertisols; riparian zones along the Purna and Wardha rivers retain moisture and evergreen elements into the dry season. Towns and peri-urban fringes include avenues, parks, educational campuses, and homestead gardens that serve as

biodiversity refuges and heat-mitigation infrastructure.

Field Visits and Documentation:

The intensive field visits are carried out in the Amravati district regions including forest areas, farmlands, urban green spaces, botanical gardens, educational campuses and sacred groves during investigation. Angisopermic trees were observed and photographs were taken. The morphological characters of tree species such as bark structure, branching pattern, leaf, flower and fruit morphology was noted. Information about resource values was collected from local vendors, tribal people, forest workers, villagers, farmers and educationists. For taxonomic study references were studied. For species identification on field and laboratory specimens are collected and identified with the help of local floras such as Singh et al. 2000, Singh and Karthikeyan 2001, Dhore 2002. The collected specimens are preserved in the form of Herbarium and deposited in Department of Botany, Bapuraoji Butle Arts, Narayanrao Bhat Commerce and Bapusaheb Patil Science College Digras District Yavatmal Maharashtra.

Results and Discussion

The present investigation documented about 132 tree species belonging to 42 families of angisoperms. The dominant and diverse tree species are from the family Mimosaceae, Caesalpinaceae, Papilionacaeae, Bignoniaceae, Moraceae, Apocynaceae, Rubiaceae and Rutaceae. Across strata, forests held the highest species richness and structural complexity. Common native taxa included *Tectona grandis, Anogeissus latifolia, Boswellia serrata, Terminalia tomentosa, Lannea coromandelica, Buchanania cochinchinensis, Diospyros melanoxylon, Madhuca longifolia, Pterocarpus marsupium*, and multiple Ficus species (*F. religiosa, F. benghalensis, F. racemosa*). Riparian sites featured *Terminalia arjuna, Syzygium cumini, Ficus religiosa, and Tamarindus indica.*

Table 1: List of the Angiospermic Trees Species with their Resource Values

Sr. No.	Family	Tree Species	Common Name
1.	Annonaceae	*Annona reticulata*	Ramphal
2.		*Annona squamosa*	Sitaphal
3.		*Polyalthia longifolia*	Devdar Ashok
4.		*Miliusa tomentosa*	Homba
5.	Bixaceae	*Bixa orellana*	Latkan
6.	Clusiaceae	*Garcinia indica*	Kokum
7.	Capparaceae	*Capparis decidua*	Kera
8.		*Capparis grandis*	Pachoonda
9.	Malvaceae	*Kydia calycina*	Ranbhendi
10.		*Thespesia populnea*	Devkapus
11.	Bombacaceae	*Bombax ceiba*	Katesawar
12.		*Ceiba pentandra*	Samali
13.	Sterculiaceae	*Helicteris isora*	Murad sheng
14.		*Pterospermum acerifolium*	Moochkund
15.		*Sterculia urens*	Karai
16.	Teliaceae	*Grewia subinequalis*	Dhaman
17.	Elaecarpaceae	*Muntigia calabura*	Paanchara

18.	Rutaceae	*Aegle marmelos*	Bael
19.		*Citrus aurantium*	Santara
20.		*Citrus limon*	Limbu
21.		*Limonia acidissima*	Kovit
22.		*Murraya koenigi*	Kadhipatta
23.		*Murraya paniculata*	Kamini
24.	Simaroubaceae	*Ailanthus excelsa*	Maharukh
25.		*Simarouba glauca*	Bitterwood
26.	Balanitaceae	*Balanites aegyptiaca*	Hinganbet
27.	Burseraceae	*Boswellia serrata*	Salayi
28.	Meliaceae	*Azadirachta indica*	Neem
29.		*Chloroxylon swietenia*	Halda
30.		*Melia azedarach*	Bakanimb
31.		*Soymida fabrifuga*	Rohan
32.	Celastraceae	*Cassine glauca*	Aran
33.	Rhamnaceae	*Zizyphus mauritiana*	Bor
34.	Sapindaceae	*Sapindus emarginatus*	Ritha
35.	Anacardiaceae	*Buchnania lanzan*	Charoli
36.		*Mangifera indica*	Amba
37.		*Semecarpus anacardium*	Bibba
38.	Moringaceae	*Moringa oleifera*	Shevga
39.	Papilionaceae	*Butea monosperma*	Palas
40.		*Dalbergia sissoo*	Shisham
41.		*Erythrina suberosa*	Pangara
42.		*Eryrthrina variegata*	Mandar
43.		*Gliricidia sepium*	Madri
44.		*Pongamia pinnata*	Karanj
45.		*Sesbania grandiflora*	Hatga
46.	Caesalpinaceae	*Bauhinia blakeana*	Rakt Kanchan
47.		*Bauhinia purpurea*	Rakt Kanchan
48.		*Bauhinia racemosa*	Apta

49.		*Cassia fistula*	Amaltas
50.		*Cassia siamea*	Kassod
51.		*Delonix regia*	Sankasura
52.		*Hardwikia binata*	Anjan
53.		*Parkinsonia aculeata*	Adanti
54.		*Peltophorum pterospermum*	Copperpod
55.		*Sarava asoca*	Sita Ashok
56.		*Tamarindus indica*	Chinch
57.	Mimosaceae	*Acasia auriculiformis*	Earleaf
58.		*Acasia chundra*	Khair
59.		*Acasia lucophloea*	Hiwar
60.		*Acasia nilotica*	Babhul
61.		*Albizia lebbeck*	Sirish
62.		*Albizia procera*	Pandhara sirish
63.		*Leucaena leucophloea*	Subabhul
64.		*Pithocellobium dulce*	Vilayti chinch
65.		*Prospis cinneraria*	Shami
66.		*Prospis juliflora*	Bangali Babhul
67.		*Samanea saman*	Vilayati Siris
68.	Combretaceae	*Anogeissus latifolia*	Dhawda
69.		*Terminalia arjuna*	Arjun
70.		*Terminalia bellerica*	Behada
71.		*Terminalia catapa*	Deshi Badam
72.	Myrtaceae	*Callistemon citrinus*	Bottle Brush
73.		*Eucalyptus globulus*	Nilgiri
74.		*Psidium guajava*	Peru
75.		*Syzigium cumini*	Jambhul
76.	Lythraceae	*Lagerstroemia indica*	Pharash
77.		*Lagerstroemia speciosa*	Jarul
78.		*Lawsonia inermis*	Mehndi
79.	Punicaceae	*Punica granatum*	Dalimb

80.	Lecythidaceae	*Couropita guanensis*	Kailaspati
81.		*Careya arborea*	Khumba
82.	Rubiaceae	*Anthocephalus chinensis*	Kadam
83.		*Gardenia jasminoides*	Gandhraj
84.		*Gardenia resenifera*	Dikemali
85.		*Mitragyna parviflora*	Kalamb
86.		*Morinda tomentosa*	Nunna
87.	Sapotaceae	*Madhuca indica*	Mowa
88.		*Manilkara hexandra*	Rayan
89.		*Manilkara zapota*	Chiku
90.		*Mimusops elengi*	Bakul
91.	Ebenaceae	*Diospyros melanoxylon*	Tendu
92.	Boraginaceae	*Cordia dichotoma*	Bhokar
93.		*Cordia gharaf*	Gondani
94.		*Cordia sebestina*	Bohari
95.	Apocynaceae	*Alstonia scholaris*	Satwin
96.		*Carissa carandus*	Karvanda
97.		*Holarrhaena antidyscentrica*	Kuda
98.		*Thevetia peruviana*	Pil Kaner
99.		*Wrightia tinctoria*	Kala Kuda
100.		*Plumeria rubra*	Lal Champa
101.	Bignoniaceae	*Millingtonia hortensis*	Akash Nim
102.		*Dolichondrone falcata*	Medshingi
103.		*Radermachera xylocarpa*	-
104.		*Spathodea campanulata*	Rugtoora
105.		*Stereospermum suavelolens*	Parul
106.		*Tabebuia argentia*	
107.		*Tecoma stans*	Sonpatti
108.	Verbenaceae	*Clerodedron multiflorum*	Takal
109.		*Gmelina arborea*	Shivan
110.		*Tectona grandis*	Sagwan

111.	Oleaceae	*Nyctanthes arbor-tristis*	Parijatak
112.	Proteaceae	*Grevellia robusta*	Rupasi
113.	Euphorbiaceae	*Bridelia retusa*	Asana
114.		*Cicca acida*	Rai avala
115.		*Cleisthanthus collinus*	Garari
116.		*Emblica officinalis*	Awala
117.		*Putranjiva roxburghii*	Putajan
118.	Ulmaceae	*Holoptelea integrifolia*	Papra
119.	Moraceae	*Artocarpus heterophyllus*	Phanas
120.		*Ficus benghalensis*	Wad
121.		*Ficus carica*	Anjir
122.		*Ficus glomerata*	Umbar
123.		*Ficus hispida*	Kala Umbar
124.		*Ficus religiosa*	Pimpal
125.		*Morus alba*	Tuti
126.	Casuarinaceae	*Casuarina equisetifolia*	Saru
127.	Pandanaceae	*Panadanus odoratisimmus*	Kevada
128.	Arecaceae	*Borasus flabellifer*	Tad
129.		*Caryota urens*	Berli
130.		*Cocus nucifera*	Naral
131.		*Phoenix salvestris*	Shindi
132.		*Roystonia regia*	Royal Palm

Agricultural landscapes were dominated by multipurpose and fruit trees: *Azadirachta indica* (neem), *Dalbergia sissoo* (sissoo), *Mangifera indica* (mango), *Syzygium cumini* (jamun), *Aegle marmelos* (bael), *Leucaena leucocephala*, *Albizia lebbeck*, *Annona squamosa* (custard apple), *Ziziphus mauritiana* (ber), and *Tamarindus indica*. Urban/peri-urban greens were species-poorer but included hardy, pollution-tolerant plantings: *Polyalthia longifolia*, *Melia azedarach*, *Cassia fistula*, *Alstonia scholaris*, and avenue *Azadirachta* and *Delonix regia*. Old *Ficus* and *Tamarindus* individuals in campuses and temples contributed disproportionately to canopy cover and fauna support.

Resource values of documented species

T**imber and poles:** Teak remains a premier timber species in reserved tracts and farm woodlots. *Dalbergia sissoo* provides durable poles and saw timber; *Albizia lebbeck* and *Acacia/Senegalia* spp. offer light construction wood and implements. *Lannea* and *Anogeissus* contribute poles where regulations permit.

Fuelwood and charcoal: Households harvest lopped branches of *Anogeissus*, *Lannea*, and *Acacia/Senegalia* near settlements; *Leucaena* coppices rapidly for on-farm fuel needs.

Fodder: *Albizia lebbeck*, *Leucaena leucocephala*, *Ficus religiosa*, and in drier pockets *Prosopis cineraria* supply leaf fodder; pods of *Leucaena*

(managed carefully) supplement protein for small ruminants.

Fruits and nutrition: Mango, Jamun, Tamarind, Custard apple, Ber, and planted *Emblica officinalis* (aonla) contribute home nutrition and local market income. *Madhuca longifolia* flowers are seasonal foods and can be processed into value-added products.

Medicinal and cultural values: Neem leaves/bark (antimicrobial), bael leaves/fruit (digestive), *Terminalia arjuna* bark (cardiac), *Alstonia scholaris* bark (febrifuge), and *Ficus* latex have wide ethnomedicinal applications. Large *Ficus* and *Aegle* trees serve as cultural keystones in sacred spaces.

Gums, resins, and lac: *Boswellia serrata* yields oleo-gum resin; *Sterculia urens* produces karaya gum; lac is cultivated on hosts like *Butea monosperma* and *Ziziphus* spp. where extension support exists.

Agro-ecosystem services: Boundary trees reduce wind desiccation, shade livestock and workers, stabilize bunds, supply mulch and green manure, and host pollinators/natural enemies that benefit crops.

Urban ecosystem services: Tree canopies mitigate heat islands through shade and evapotranspiration, intercept dust, and improve walkability—key during April–June heatwaves. Veteran avenue trees provide habitat for birds and bats, enhancing urban biodiversity.

Carbon storage and climate regulation: Mature dry deciduous stands and veteran *Ficus/Tamarindus* store substantial above-ground carbon; even small urban and farm trees contribute meaningfully when scaled district-wide.

Threats and pressures

Primary pressures include habitat conversion and fragmentation at forest edges; recurring ground fires and unregulated grazing that suppress seedling recruitment; over-tapping of resin/bark on slow-growing species; and spread of invasive/aggressive exotics (*Prosopis* juliflora, unmanaged *Leucaena*). Urban threats include trenching for utilities, root compaction, poor pit design, and unsystematic topping/pruning. Increasing climate variability (late monsoon onset, prolonged dry spells) elevates mortality risk for seedlings and shallow-rooted species.

The cross-landscape documentation underscores that conservation and production goals can be co-optimized when native structure is retained across the mosaic and ecological flows are maintained along riparian and hedgerow corridors. Teak-centric management yields timber revenue but can reduce evenness and understory diversity; blending teak with *Terminalia, Anogeissus, Diospyros, Buchanania,* and *Madhuca* can maintain economic value while enhancing resilience to pests, drought, and fire. On farms, widespread reliance on neem and sissoo reflects seedling availability and the need for fast returns; however, integrating native fruit/fodder trees—*Aegle marmelos, Syzygium cumini, Tamarindus indica, Moringa oliefera, Ziziphus* spp.—can diversify nutrition and income while supporting pollinators. In urban areas, moving beyond narrow-crowned ornamentals toward broad-crowned, deep-rooted native species can amplify cooling, habitat value, and storm-resilience, provided root zones are protected and pruning is professionalized.

Valuation insights suggest that indirect services often equal or exceed direct product values over a tree's lifetime. Shade can reduce cooling energy demand, riparian trees reduce siltation and flood risk, and carbon storage—though diffuse—accumulates substantially at district scale. Such benefits justify public investment in mixed-species roadside and canal plantings, riparian buffers, and protection of veteran trees. NTFP pathways (gum/resin/lac, Madhuca flowers, leaf-plate stitching from Bauhinia and legally permitted sources) offer livelihood augmentation where harvesting is sustainable and market linkages exist.

Finally, regeneration is the fulcrum of long-term supply. Assisted natural regeneration (ANR) with fire and grazing control, enrichment planting in selectively logged or degraded patches, and community-agreed seasonal closures can rapidly restore structure and function. Participatory monitoring—simple plot re-measurement by colleges and local groups—can track survival, growth, and recruitment to guide adaptive management.

Conclusion

Documenting tree species and their resource values in Amravati reveals a resilient yet pressured living infrastructure that supports biodiversity, agriculture, public health, and culture. Forests anchor native diversity; farms extend functional services and household incomes; towns derive cooling and amenity from strategically planted trees. To sustain and enhance these benefits, management must shift from single-species, short-term goals to landscape strategies that combine native enrichment, riparian restoration, sustainable NTFP harvests, and robust urban tree care. With participatory monitoring and targeted extension, Amravati can secure its tree-based natural capital for the long term while improving livelihoods and climate resilience.

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