# *Detail Project Report of Tree Plan*

## Green Coverage & Tree Plan Nov-2022

माझी वसुंधरा
MY EARTH
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**Submitted to-**

**AHMEDNAGAR MUNICIPAL CORPORATION**

# अहमदनगर महानगरपालिका,अहमदनगर

Tal- अहमदनगर Dist - अहमदनगर

Out Word No/ 0154/12022 Date 03/12/2022

## जाहिर सुचना

अहमदनगर महानगरपालिकेमार्फत माझी वसुंधरा अभियान 3.0 अंतर्गत पृथ्वी, वायु, जल, अग्णी, आकाश या पंचमहाभुतांवर आधारीत अहमदनगर शहर हद्दीतील सर्व झाडांची जनगणना (Tree Census) , ३३% हरित क्षेत्र निर्मीती (33% Green Coverage),५० वर्षावरील झाडांची गणना (Heritage Tree Census), जैवविविधता नोंद वही तसेच महापालिकेच्या विविध कार्यालयाचे energy ऑडिट व Water ऑडित करण्यात आले असुन सदर कामांचे अहवाल नागरिकांना पाहणी करणे कामी महानगरपालिका कार्यालय येथे उपलब्ध करुन देण्यात आलेले असुन ज्या नागरिकांना सदर प्रकल्प अहवालाची माहिती उपलब्ध करुन घ्यायची असेल त्यांनी अहमदनगर महानगरपालिका कार्यालय येथे संपर्क करुन सदर माहिती उपलब्ध करुन घेऊ शकतात.

आयुक्त

अहमदनगर महानगरपालिका ,अहमदनगर

Ahmednagar Municipal Corporation Ahmednagar

Dy. Commissioner

Ahmednagar Corporation, Ahmednagar

# Contents

# 1. INTRODUCTION

Tree cover in urban areas around the world, is declining and inflexible cover is increasing due to the demand of the land for development Forest Survey of India (FSI) has been assessing country's forest cover since the 1980's using data from remote sensing satellites on a two-year cycle. Due to a substantial number of trees tree cover is not captured by the Satellite data and reported as tree cover for the first time in 2001 assessment. The planned development of Municipal Corporation present a clean and green with trees, plants, lakes and parks and towns in Chennai. It is growing at fast pace in terms of urbanization, technology, infrastructure, and environment. The pace of urbanization is harmfully affecting the green cover in the urban areas. Trees provide numerous Environmental, Social and Economic benefits to people and their services in maintaining environment are been universally accepted. The tree canopies shows moderate temperature, provide shade to building, area of sidewalk, streets and reduce pollution. Urban areas Kuhelmeister, G., 1998 can comprises large variety of green spaces, such as Parks/ gardens green space near institution, Industrial area green spaces ( Heinze, J., 2011), and private green spaces (Boone et al, 2010). It includes woodlands, farm lands, public gardens and play areas. Green spaces play a major role in urban areas through their environmental, aesthetic, social and economic contributions to residents' health and wellbeing (Cavanagh et al. 2009). (e.g.Faryadi and Taheri, 2009). In order to design an appropriate urban green cover assessment, spatial features must be evaluated. An attempt is carried out in this studyto map the status of green coverage land use and land cover of the Ahmednagar Municipal Corporation area using high resolution satellite data. In order to achieve the goal, high resolution satellite data, were used to analyses the spatial pattern of land cover change in the area and the future growth was modelled by applying CA-Markov model. Spatial features like Point feature and polygon features were demarcated from imagery. Individual trees, group of trees, bushes, building area (covering both residential/industrial area), water bodies (lakes, ponds, reservoir, streams, rivers etc. parks and temples has been considered detect the land consumption rate and the changes that have taken place particularly in their built-up area.

# 2. STUDY AREA AND DATASET

GIS datasets are common data sources used for geo processing and are useful for automated data processing and GIS analysis. Datasets are used as inputs, and new datasets are derived as results for various geo processing tools. Geo processing helps you to automate many tasks as a series of operations so they can be run as a single step. This helps to create a repeatable, well-documented data processing workflow. Users also work with Arc GIS datasets to perform spatial analysis. Visual interpretation plays a major role in

delineating spatial features of the earth by a geospatial expert. It can be concluded that, green space planning could be an essential component of any urban development.

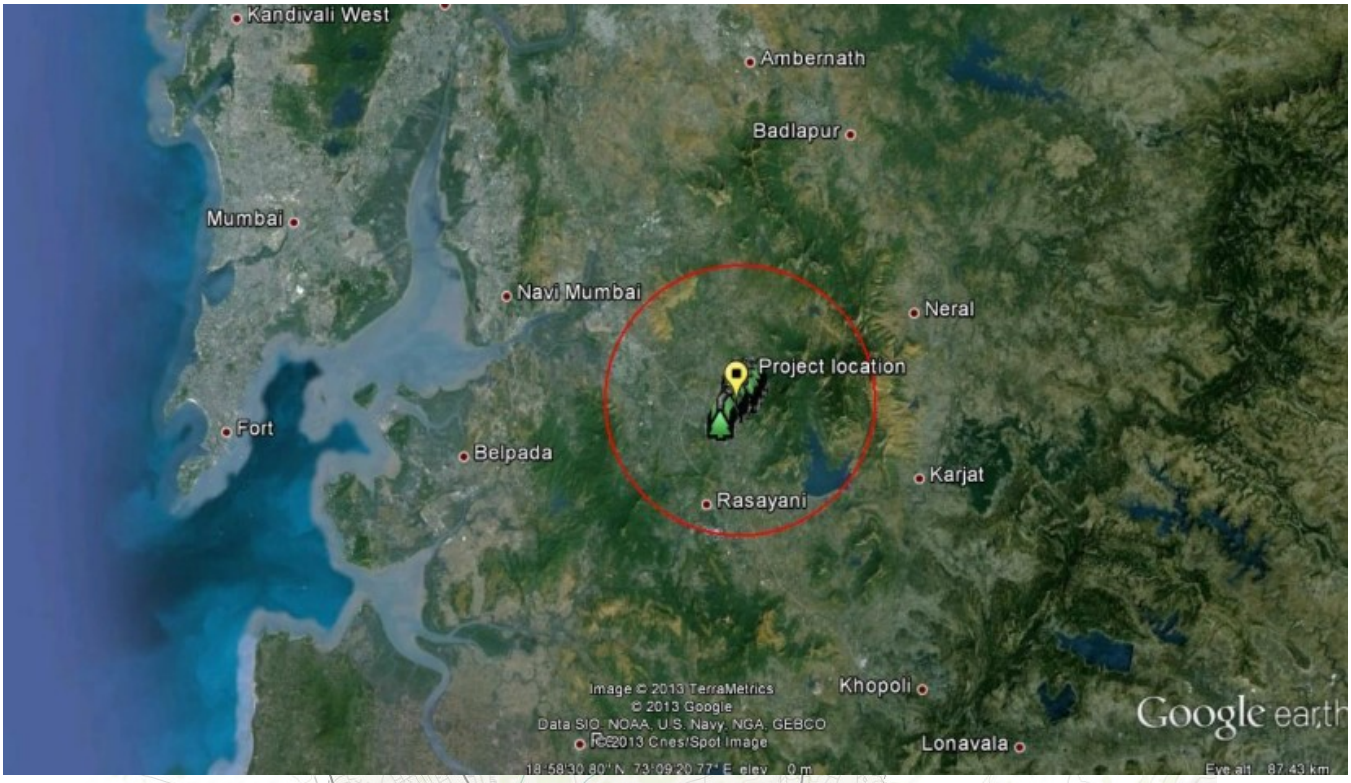
Sufficiently large and protected greenspaces reduce the impact of human activities on climate. The ecosystem services provided by the urban greenspaces help the city in general and its citizens to adapt to the adverse effects of climate changeand disasters.

**Description:**

To what extent is the city developing and increasing its green cover. Green Cover, defined as natural or planted vegetation covering a certain area of terrain, functioning as protection against soil erosion, protecting the fauna, and balancing the temperature. For the purpose of this indicator, green areas are defined asman-made city level and zonal/ district level greens; and reserved/ protected areas as per MoHUA's Green Guidelines, 2014 and protected areas under the Wildlife Protection Act, 1972.

## 3. METHODOLOGY - GREEN COVER MAPPING

Tree cover means the area covered by crown of trees that is too small to be delineated by digital interpretation of remote sensing data at 1:50,000 scales used for forest cover assessment. India's National Forest Policy aims at maintaining 33 percent of country's geographical area under forest and tree cover. (http://www.fsi.nic.in/sfr2003/treecover.pdf). The present assessment of forest cover, carried out by digital processing of Google Image, includes forests and tree crops having 10 percent or more canopy density and with an area of more than 1.0 ha. The tree cover comprises of small patches of trees in plantations and woodlots, or scattered trees on farms, homesteads and urban areas, or trees along linear features, such as roads, canals, bunds, etc. has been estimated by mainly using field inventory methods. Boundary of the grouped trees was demarcated spatially and its spatial extension has been calculated. From Ground truth information, the tree diameter is identified. Number of trees within the spatial extent can be attained by aggregating the trees diameter to total demarcated area. Tree Cover in the urban areas should be treated as important and essential constituent of urban infrastructure. Estimation of tree population and tree cover in urban area and publication of a report on the status of tree cover in Jurisdiction of Municipal Corporation shall be of immense use for developing appropriate action plan to improve tree cover for all urban areas.



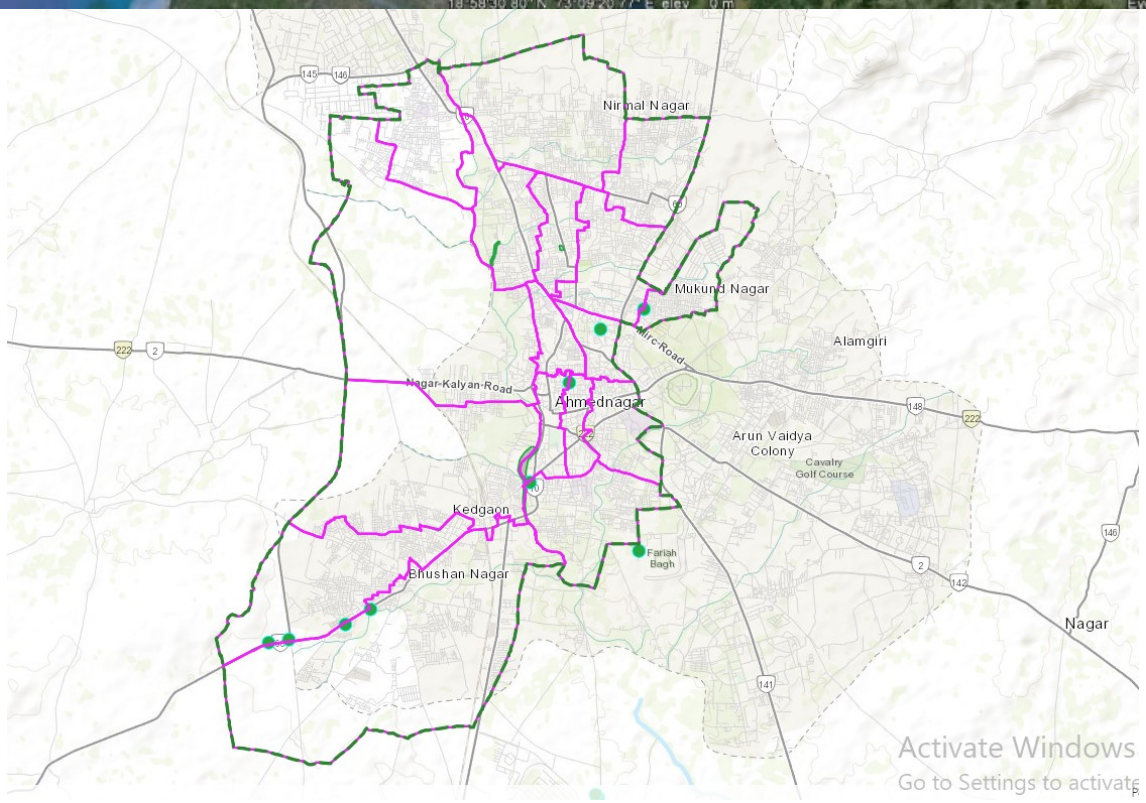




Fig. Location of Municipal Corporation

**Crown area mapping:-**

Crown area is the area covered by the living branches and foliage of trees. It is often expressed as a percentage of total land area. Crown area is estimated using Sky camera in

the real field conditions. In our work, data helps to find the crown diameter of individual tree. It is well known fact the gaps of the trees will not counted as crown area, which is eliminated in the shape file. Average crown spread is one of the parameters commonly measured as part of various champion tree programs and documentation efforts. Other commonly used parameters, outlined in Tree measurement, include height, girth, and volume. Methodology of Tree height measurement, Tree girth measurement, and Tree volume measurement are presented in the links herein.

**Methodology:-**

Data available on area of urban greens can be analyzed from satellite imagery. Recent imagery can be procured from the state or National Remote Sensing Centre (NRSC). Baseline year: 2019. Comparative analysis using the formula given below on a yearly basis will help to understand the increase/decrease over time. This data is also being reported by cities for the Ease of Living Index and may be sourced from there

Formula:

Green Cover in sq.km /Municipal Corporation area in sq.km x 100

Unit: %

**Formula:**

$$\frac{\text{Green Cover in sq.km}}{\text{Municipal area in sq.km}} \times 100$$

**Unit: %**

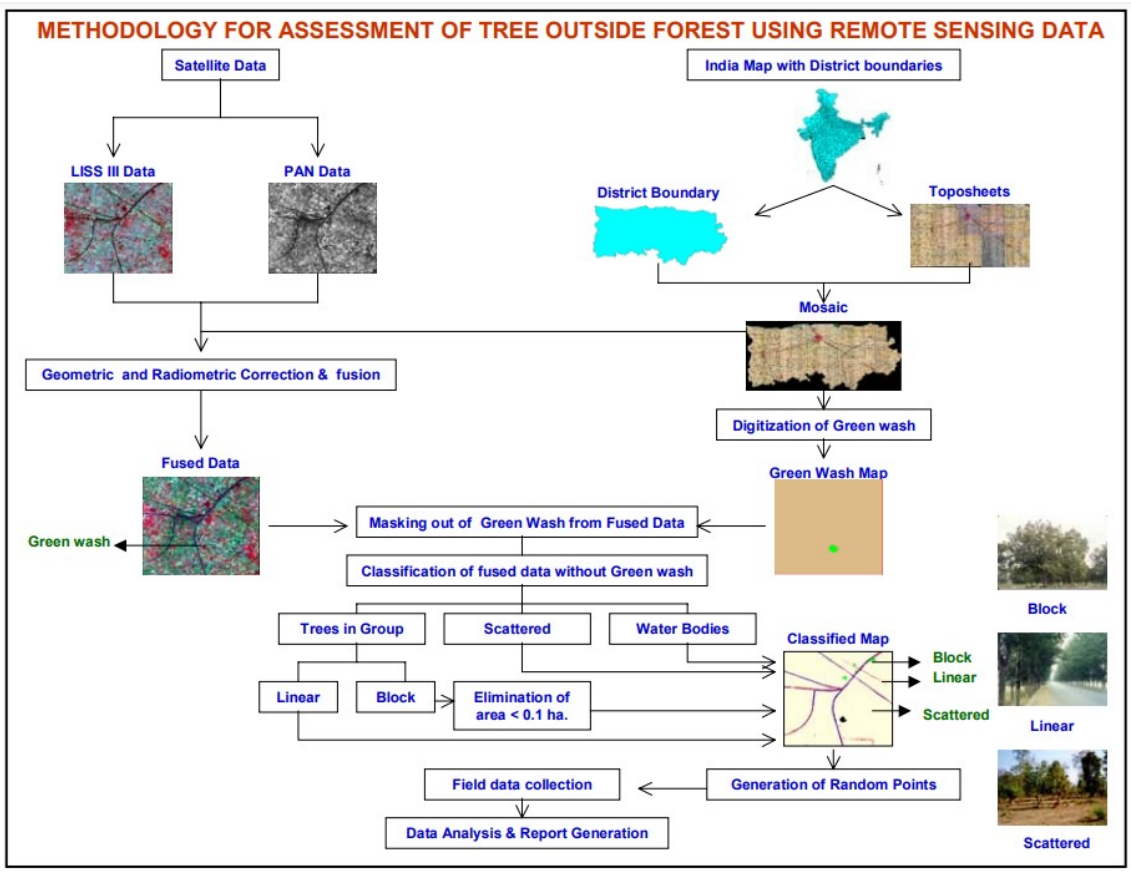



Fig. Flow chart of methodology of Tree Cover mapping

## 4. RESULTS AND DISCUSSIONS

It is clear from the visual interpretation that urban and built up has increased significantly based on the assessment. The accuracy assessment will help in validating green coverage area. The estimation of total number of trees in Municipal Corporation is shown in Table-1. The interpreted results of percentage of urban green area assessment is shown in Table-2. Municipal Corporation boundary covers total area of 80 Sq.km in which minimum area is occupied with temple area and maximum area occupied with Farm Land followed by City, buildings. Spatial features like Point feature and polygon features were distinguished from imagery. Individual trees, group of trees, bushes, City area (covering bothresidential/industrial area), water bodies (lakes, ponds, reservoir, streams, rivers etc. parks and temples has been considered. In general, trees on the road side are mentioned as avenue trees. These trees are seen as individual trees on the image as shown Figure. In the case of large grouping of trees, trees were grouped based on their shape and distribution density categorized as either sparse or high dense. In dense region, a composite map is shown with dense grouping of trees.

### 4.1 Crown area calculation

Crown spread is taken independent of trunk position. Spread should be measured to the tips of the limbs, not to “notches” in the crown shape, and at approximately right angles from each other according to equation (1)

Average crown spread = (longest spread + longest cross spread)/2 ….(1)

With the increased availability of high-resolution air photos, crowns of individual trees can be distinguished providing another option for measuring crown spread. The latitude and longitude of the tree can be read directly from Google Earth. Google Earth itself includes a ruler tool that can be used to measure diameters or spokes across the crown of the tree. Alternatively the crown area can be measured and crown spread calculated from that value. Easy Acreage V1.0 (demo version) http://www.wildsoft.org / 2013 is a Google Earth area measurement tool that calculates the area of any shape outlined on the Google Earth display. Outline the edge of the trees canopy, following the branches and hollows around the canopy perimeter, including any enclosed hollows within the canopy outline and read the area provided by Easy Acreage. Average crown spread can be determined with a simple formula in equation (2).

$$\text{Crown spread} = 2(\text{area}/\pi)^{1/2} \qquad (2)$$

$$TA = \frac{T_{CRA} - T_{NT}}{\prod \times R^2} \qquad (3)$$

Here area is taken as the

area of an equivalent circle.

Where TA = Total tree area, TCRA = Total crown area NT = Number of trees.

The total area of Municipal Corporation comprises of 80 Sq.km. Authority map has been used for deriving boundary. Layers were derived imagery based on themes.

During the path of the mapping techniques, area of buildings as view from space a minimum size of 2m*2m size can be mapped. Larger buildings could be spatially mapped in a convenient manner. From the analysis, a strategy of an eight percent cover from the obtained cover is employed to get the actual crown cover from the total area. Each tree area is calculated, assuming area is the area of an equivalent circle (circle area= ∏r 2 ). Approximately Circle Radius value was taken as 3m and each tree area is (3.14*3*3) calculated by total number of trees from total crown area divided by each tree area is shown in equation (3).

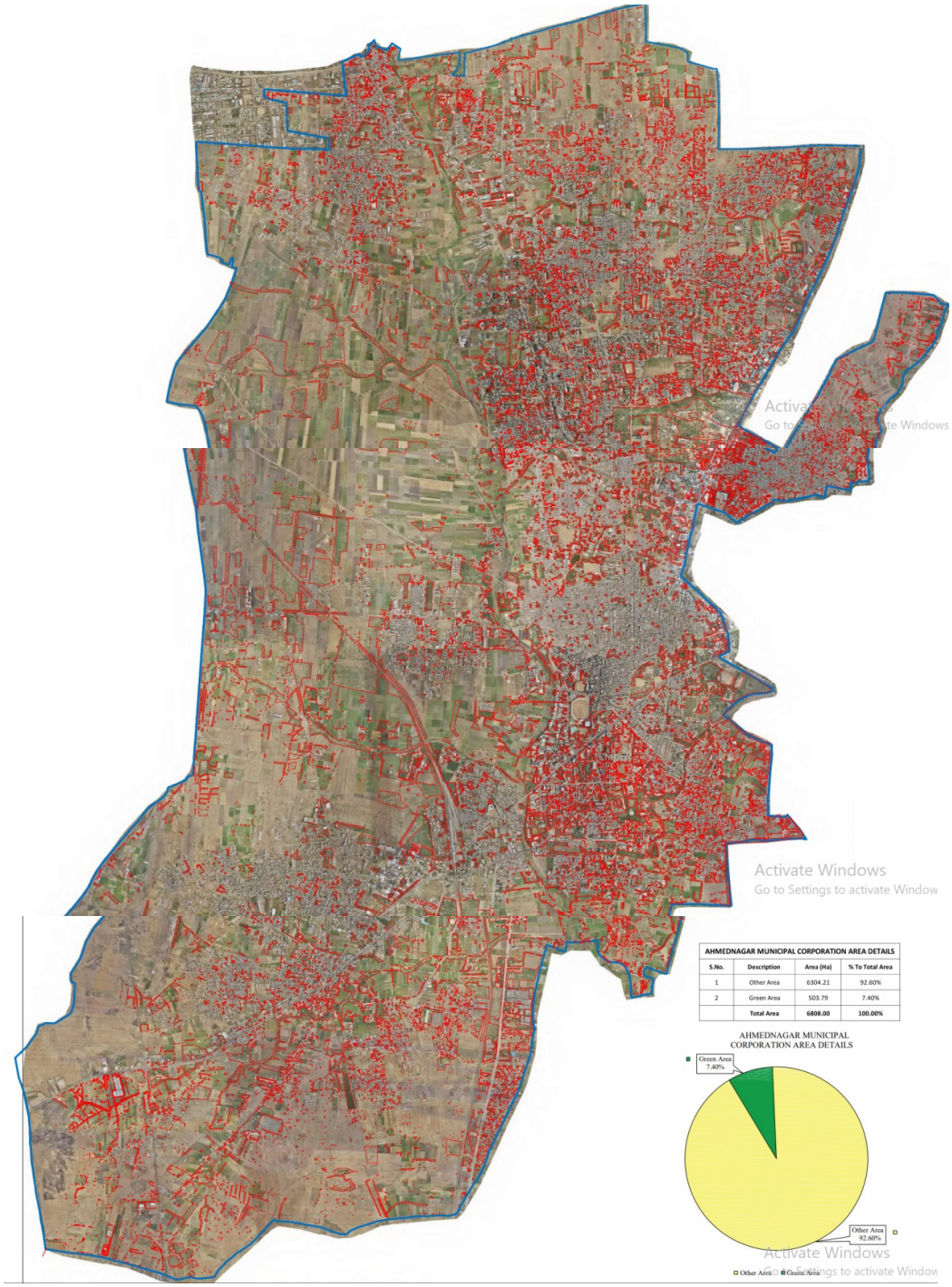



Fig. Green Mappingand open land

The map scale has been fixed to 1:10000 scales in order to obtain maximum features with precise accuracy. Mapping of individual buildings have been shown in the

| Name of Municipal Corporation | Total area Sq.km | Total area of Green Cover Sq.km | Total area of Open Land Sq.km | % of Green Cover | Number of trees in Municipal Corporation |
|---|---|---|---|---|---|
| Ahmednagar | 80 | 16.461 | 12.614 | 7.40% | 115000 |

## 5. Policy & Planning

- **Acquire an up to date and complete assessment of Tree canopy.** Using available services provided through 100RC partnerships, India can gather and analyze data as well as make a tool for Urban forest planning. This also needs to be planned and budgeted for on a recurring 5-year cycle.
- **Update the comprehensive Urban Reforestation Master Plan.** All pertinent municipal departments must collaborate and devise a master plan for maintaining and enhancing India's Urbanforest.
- **Create a tree ordinance.** A more detailed and extensive ordinance for maintaining and protecting India's Urban forest is necessary to uphold the Urban Forest MasterPlan.
- **Acknowledge trees as public service providers in Revised Ordinances of India.** Trees must have the same rights as public utilities as they provide the public with similar services and benefits.

## 5.1 People & Implementation

- **Budget for and hire Community Foresters, Nursery Workers, and Landscape Architects.** An interface between the City and community is needed to implement an Urban Forest Master Plan, as well as, plant growers, and more support for internal City coordination on project design and projectreview.
- **Recruit and train volunteers.** As the City does not have staff to maintain all newly planted trees under this initiative, neighborhood champions must be identified and equipped with the skills and tools to maintain the trees in their neighborhood.

## 5.2 Practice & Maintenance

- **Trees and streets.** Trees are an integral component of Complete Streets, therefore streets should be designed with accommodation for healthy shade trees.
- **Trees and stormwater.** Trees can and should be utilized as tools for managing stormwater.

**Trees and private property.** An incentive program or credit on the future stormwater fee would be beneficial for addressing the challenge of getting trees planted and maintained on privateproperty.

## 6. URBAN TREE CANOPY GOAL

The City has developed a vision statement to guide the development of goals, objectives, and implementation strategies. The vision statement is a short focused statement about how and why trees are important to the community now and into the future. It provides an image of what the community wants to look like in the future and how it wants to function. The City strives to accomplish the goal of increasing the Urban tree canopy to 35% by 2035.

Tree Canopy Assessment was conducted in Nov-2022 and a change detection analysis was completed in Dec-2022 Neither study covered all communities (i.e., "Urban canopy" goal)—see Figure 3. Through the City's participation in the Majhi Vasundhara Abhiyan3.0 , Gram sevak leading the effort to update and expand our Tree Canopy Assessment to better inform the strategies and actions to plan for and progress with the tree goals as defined above. The following describes near- and long-term actions and recommendations for the City to progress on its Urban forestry commitments.

Residents envision India as a City where:

- Trees are valued, nurtured, integral, diverse, attractive, and functional. Trees are everywhere. Trees are older, bigger, representative of the future, and an integral part of the planning process.
- Trees provide habitat for wildlife and a connection to and an understanding of nature. They are a path for a future. They provide shade, beauty, color, and a sense of place / community, character / shape to the community, recreational and tourism opportunities, education, and a sense of pride. They also provide food and the benefits of reduced stormwater and energy consumption.
- Trees help us celebrate nature, transform communities, and connect generations by passing continued appreciation of nature to the next generation.

### RECOMMENDED STRATEGIES FOR THE CITY

The following strategies are within the categories of City Action, Regulatory, Public Education, and Community Volunteer.

Internal collaboration and coordination are important for the success of these efforts. City Departments need to internalize that the tree goals are not government or private organisation goals, but that they are the Gram Sevak's and City's tree goals. This requires consistent messaging and conversations to influence business-as-usual work with respect to the Urban forest. CCSR can be involve that will lead these discussions through the development of

department reporting systems with involved departments to produce monthly information for the City Administration.

Additionally, it is critical that existing rules and regulations that should result in the planting of trees be adhered to, and that if and when a City agency's actions result in the removal of a City tree due to contracts including road rehabilitation, sidewalk reconstructionor otherwise, that at least one tree is replanted in the vicinity of the removed tree.

If we continue to allow trees to lose out to other real and/or perceived infrastructure and community planning and design conflicts, we will all lose out with respect to environmental and community quality and health.

## City Action Strategies

- Identify and prioritize areas for tree planting and prepare a schedule.
    - ✓ The City should identify priority areas for tree planting so as to maximize benefits from the resources invested. The City should establish criteria for selecting those sites and indicators to measure their success. These criteria and indicators can be based on specific objectives such as environmental protection, economic development, aesthetic identity or social enhancement.
    - ✓ The City should also be careful about planting the right trees in the right place to optimize their prospect of success. The wrong tree in the wrong place is almost a guaranteed failure. Tree species should be selected on the basis of the nature of the site, the area available, the intended use and the intensity of the use. However, the City should also work to identify opportunities to make more room for trees where there is excessive or unused paved areas, creating new spaces for "right tree, right place." Cost issues are equally important while selecting the appropriate species. Both onetime costs of planting trees and long term maintenance costs should be considered while making such decisions. Since the success of these programs largely depends on the maintenance of trees after they areplanted, the City should prepare a schedule for planting as well as regular maintenance of trees.
- Prioritize budget
    - ✓ An Urban Tree Canopy Program makes economic sense and should have a strong financial footing. With the ability to quantify the environmental, social and economic benefits and the ability to express those benefits in dollar amounts, it is easier to compare the benefits of Urban trees against cost. With increasing use of green infrastructure concepts, and

recognizing the services provide by trees as described earlier, it is easier to view the investment in an Urban tree program as comparable to any other infrastructure investment such as roads and waste water facilities.

- ✓ The City should prioritize the budget for the Urban Tree Canopy Program. The City can use the above arguments to secure more funds. An Urban Tree Canopy program will probably always rely on the general funds; however there are other options available that can provide additional revenue streams. For example a tree-related fee can be established under development fees to support tree programs in newly developing areas of the City.

- Establish clear line of responsibilities
  - ✓ A successful Urban Tree Canopy Program requires coordination between different departments. Trees planted today will continue to grow for years to come and probably outlive the people who planted them. For the program to really work, a clear line of responsibility should be established among departments and among positions within a department for planting, caring and ongoing maintenance of trees. While assigning responsibilities, it is important to ensure that the office has qualified personnel and adequate resources to carry out assigned functions. Since it requires the involvement of many departments, one department can lead the program and coordinate with all the supportingdepartments.

**Regulatory Strategies**

- Establish a tree ordinanceto:
  - ✓ The City should consolidate disparate tree-related ordinances into one chapter and incorporate the use of trees and shrubs for stormwater management while providing for, maintaining, or improving existing tree canopy.
- Include in the new Tree Ordinance, a section on Urban Tree Canopy to establish appropriate tree canopy requirements for parkinglots.
  - ✓ The City should adopt a tree ordinance that will include the tree canopy requirements for parking lots. This requirement should be targeted towards large parking lots. Small parking lots may be exempted. A sliding scale should be used to require a higher percentage of shaded areas for largerlots.
- Amend the subdivision regulation to include forest and tree protection measures for new development on green fields when establishing areas for stormwatermanagement.
  - ✓ The City should require a certain percentage of the site to be set aside to be preserved as open space. These open spaces should also

comply with the tree canopy requirements. The percentage of the site dedicated for open space should be determined on the basis of the zoning category of the site and the type of development proposed. The City should offer higher densities for clustering and preserving larger areas as open space.

- Amend subdivision regulations to include numeric tree canopy requirement for each type of street in newdevelopments.
  - ✓ Rather than trying to get trees planted after the streets have been built, tree canopy should be planned early in the process for newstreets.
  - ✓ Subdivision regulations should require a certain percent of tree canopy for each type of street in the new development. To support the tree canopy requirements, develop street standards accordingly to provide room for tree planting. Also, encourage alternative street design to accommodate more trees than required by theregulation.
  - ✓ Require newly developed sites to set aside open space for stormwater management and to support treecanopy.
  - ✓ Develop street and sidewalk standards to ensure space required for treeplanting.
  - ✓ Encourage alternative street design in order to accommodate a larger number oftrees.
  - ✓ Include tree, landscaping, and vegetation buffering requirements in the checklist used for the final site plan approval process.
  - ✓ Require a tree protection management plan prior to preliminary plan approval that will include proper methods to protect and reduce impact on trees from site planning andconstruction.

**Public Education Strategies**

- Develop a resource guidebook and publish it online. The resource guidebook will provide tree selection, planting, and proper maintenance guidance with illustrations and publish it online. The guidebook shouldinclude:
  - ✓ Types of native species and theircharacteristics;
  - ✓ Lists of invasive species in thearea;
  - ✓ Tree selections for specificareas;
  - ✓ Tree canopy requirements from the Zoning Code and Subdivision Regulation, if applicable; where to plant and where not to. *(e.g. at driveway/roads, within certain distance from road intersections, in front yards if above a certain height, within a certain distance of utilities)*;and
  - ✓ Guidance for strategic tree planting to provide energy savings, visual screening and to act as noisebarriers.

- Partner with local schools and colleges to educate schoolchildren.
  - ✓ Recognize schools and colleges that effectively manage their trees and help the City to meet its Urban tree canopy goals. The program strives to engage college students by providing service oriented learning opportunities on campus and communities outside campus through community forestry efforts. The City can establish a relationship with such programs to co-sponsor such activities and programs.
  - ✓ Directly involve students in tree related activities and recognize them. Engaging children in tree canopy activities increases their understanding of benefits of trees and helps them get involved in community tree programs. The potential partners are all the elementary, middle, and high schools inIndia.
- Promote the notion of greeninfrastructure.
  - ✓ Green Infrastructure is the interconnected network of green spaces that conserve natural ecosystem values and functions and provide associated benefits to human populations.The concept of green infrastructure is getting popular and many local and state governments have started acknowledging them in their variousplans.
  - ✓ Descriptions of existing conditions in such element should reflect an understanding of various benefits provided by the green infrastructure such as improved stormwater management and waterquality.
  - ✓ Reflect on the benefits through other elements of the comprehensive plan with appropriate links to the one element that ultimately pulls it all together (i.e.: roadside trees can be discussed in the transportation element with a link to the green infrastructure element). The City should include this component and link it to other elements such as land use, transportation, and energyconservation.

**Community VolunteerStrategies**

- Develop a program to provide free or low cost trees tohome-owners.
  - ✓ The program would provide education and financial incentives for growing trees on private properties. The program emphasizes citizens' participation as an important element of the program's success. It is a public-private partnership between the State, local nurseries and garden centers, and the local homeowners to encourage planting new trees on private residentialland.
- Promote a reward program to publicize correct tree planting and maintenance.
  - ✓ Rewarding property owners and businesses for the work well done is a popular incentive. The City should encourage and reward its residents

and businesses for good tree care through a program.

- ✓ A tree's score is based on the circumference, height, and crown spread. An applicant can determine the score him/herself based on the instructions provided. After determining the score, the Community Forester is contacted. If the tree is larger than the average trees of the same species, it is registered as a Champion Tree. Owners of the tree in the register are awarded with acertificate.

## EXISTING AND POSSIBLE TREE CANOPY

The first step in formulating a Strategic Implementation Plan for Urban Tree Canopy is to measure the existing tree canopy. Additionally, conducting a tree inventory is very helpful in determining the number of publicly owned trees, planning for new trees, and tracking their maintenance needs. However, an inventory alone might provide little information about the effect on the overall tree canopy goal of the City, and it will not account for the benefits provided by trees on privately ownedland.

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The City will focus on the following five areas to increase tree canopy coverage:

### Public right-of-way

Planting street trees can make for a pleasant, comfortable, healthy, and safe walking experience. Street trees serve as filters for noise and pollution from the vehicular traffic. Trees not only provide a safe and pleasant walking environment for pedestrians, they also provide shade for vehicles parked onstreets.

Street trees help create a sense of place and add to the beauty of the City. Trees' color, texture against the Urban background, pattern of light and shade, and utilitarian aspect make a unique impression on the minds of people. That impression becomes the identity of that Urban space. Lastly, trees are identified as integral to the achievement of our Complete Streets ordinance.

### Commercial and industrialproperties

It is very important to educate business owners in the area about the economic benefits of trees in commercial and industrial areas. Large trees along a retail strip make the area more inviting which generates more business. Studies of public perception show that customers will spend, on average, 11% more time and money in a well-treed business area. Trees provide more innovative business opportunities by making outside space suitable for dining, walkup window purchases, anddisplays. Year-round activities are more attractive as surrounding temperature is stabilized in

areas with trees. As mentioned earlier, trees also help cut energy bills; they make parking areas more pleasing by providing shade; and they reduce glare during hot summer days. Trees also reduce stormwater management costs to property owners. In addition to these benefits some businesses may have a direct stake in Urban forestry as a function of their own service such as nurseries, home and garden suppliers, and tree careproviders.

Continuing support of the business community is important not only for tree planting and long-term care and maintenance of trees in commercial areasbutthesecommunitymemberscanbepowerfulcontributorstothe

Urban tree canopy through financial support. The City should initiate an education program targeting business owners and explain the economic benefits of trees and how they influence business activities.

**Government and institutional land (County, State, Federal, and Non-Governmental Organization Owned Land)**

Government land, institutional land, and other tax exempt properties provide ample opportunities for increasing the Urban tree canopy. As these parcels are usually larger in size and in some cases are under government control, there are opportunities for the City to directly engage in a large-scale tree canopy initiative.

The City can coordinate with institutions as potential partners such as University of Hawai‘i at Mānoa, who in turn can also support advocacy and education efforts. Potential partners include hospitals, universities, schools, and otherinstitutions.

**Residentialproperties**

The development regulations affecting private properties alone cannot be as effective because these regulations deal largely with preservation and planting, but not with long-term maintenance. Continuing support from home owners and owners associations is vital to the success of an Urban tree canopy program.

The City should focus on educating homeowners and residents of the benefits of trees and provide incentives for planting and maintenance of the trees. A comprehensive resource guidebook should be developed that will provide information pertaining to tree selection, planting, and proper maintenance of trees including strategic tree planting to reduce energy consumption.

Residents' participation can be encouraged through volunteer involvement and stewardship programs, as well as, potential credits toward the future stormwater fee.

**Parks and openspaces**

Trees can be used for active or passive recreation. As the City has full control over public parks and open space, implementing programs related to tree conservation and increases in tree canopy can be effective.

The recreational and social values of parks are well-known. To add to the list of benefits of parks, City area can be used as open classrooms to educate people about the different species of trees, planting, and maintenance techniques.

## CONCLUSIONS

A Green space assessment study has been carried out to measure the existing green spaces in Ahmednagar Municipal Corporation, Ahmednagar quantitatively and to identify sites to create new green spaces in order to upraise the green spaces for the minimum required value recommended by WHO (i.e. 9.5 m2/ person). The amount of green spaces identified and the Open Lands /sites to create green spaces, in order to enhance the environmental quality of the city based on WHO standards.

## Annexures

### Appendix A –Proposed Costs

| Description | Qty | Unit Cost/ month | Annual Cost |
|---|---|---|---|
| **SALARIES** | | | |
| One (1) Park Ground Improvement Supervisor II (Community Forester II Position) | 1 | 10,500 | 126000 |
| Three (3) Nursery Worker I | 3 | 9,000 | 324000 |
| | **TOTAL SALARIES** | | **450000** |
| **Other EXPENSE** | | | |
| Additional plants for in-house planting HS | 50000 | 250 | 12500000 |
| Plants for giveaways to non-profits and public (1 gal) | 12500 | 250 | 3125000 |
| Plants for giveaways to non-profitsand public (4 in) | 10500 | 120 | 1260000 |
| Tree Gard | 50000 | 25 | 1250000 |
| Contract planting | 25500 | 30 | 765000 |
| * Additional plants for in-house planting HBG | 200 | 75 | 15000 |
| Additional nursery supplies; media,pots, fertilizer, etc. | misc. | misc. | 1,20,000 |
| Additional field supplies; stakes, ties, fertilizer, etc. | misc. | misc. | 1,30,000 |
| | **TOTAL CURR EXP** | | **19165000** |
| | **GRAND TOTAL** | | **19615000** |

Reference for Green Area/ Tree Plantation Calculation: -

| | **ForGreenarea:** | | | | | | |
|---|---|---|---|---|---|---|---|
| Reference | Description | Length | Width | Quantity | Unit | Rate | Amount |
| CPWDDSR Horticultu reandLand scaping,20 18 Item2.10.1 page216 | Grassing with selection No. 1 grassincluding watering and maintenance ofthelawnfor60daysormoret illthegrassforms a thick lawn, free from weeds andfit for mowing including supplying goodearth, if needed (the grass and earth shallbepaidforseparately).2. 10.1Inrows5 cmapartinbothdirections | 1063.0 | 1 | 1062 | sqm | 15.5 | 16461.00 |
| CPWDDSR Horticultu reandLand scaping,20 18 Item7.5page 341 | SupplyandstackingofAzadir achtaindica( Neem ) plant of height 120130cm in bigpolybagofsize25 cmas perdirection of theofficer-in-charge | | | 106 | no. | 65 | 6890.00 |
| | | | | | | **TotalAmo unt** | **23351.00** |

**Annexure-2 Treeswithits importance**

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 1 | Acaciahorrida | -- | Deciduous | Avenuetree |
| 2 | Acacialeucophloea | -- | Deciduous | -- |
| 3 | Acaciamangium | Cultivated ingarden& avenue | Usedingreenbelt | Avenuetree |
| 4 | Agasti | Gardenplant | Deciduous | Timber & Tanninyielding plant |
| 5 | Ain | -- | Deciduous | Timberyielding & Medicinalplant |
| 6 | Akashneem | Cultivatedin garden | Semievergreen | Volatile oil,paper industry |
| 7 | AlbiziaLucidior | Cultivatedin garden | Deciduous | Avenuetree |
| 8 | Allspice tree | Cultivatedin garden | Evergreen | Used asspice |
| 9 | Alstoniamacrophylla | Cultivatedin garden | Evergreen | MedicinalPlant |
| 10 | Alu | -- | Evergreen | Fruitsareedible |
| 11 | Amba | Cultivated plant | Evergreen | Importantcommercial fruit |
| 12 | Ambada | -- | Deciduous | Timberyieldingplant |
| 13 | Anjir | Cultivated inorchard | Evergreen | Importantdryfruit |
| 14 | Ankul | -- | Evergreen | Medicinal |
| 15 | Apta | Cultivatedin garden | Evergreen | Barkmedicinal |
| 16 | Arjun | -- | Deciduous | Barkmedicinal |
| 17 | Asana | Avenue | Deciduous | Fruitsareedible |
| 18 | Ashok | Gardenplant | Evergreen | Ornamental,medicinal bark |
| 19 | Asupalav(D) | Avenue | Evergreen | Ornamental |
| 20 | Asupalav(M) | Avenue | Evergreen | Ornamental |
| 21 | Asupalav(S) | Avenue | Evergreen | Ornamental |
| 22 | Atrun | -- | Deciduous | Fruitsedible |
| 23 | Australianbabhul | Avenue | Evergreen | Avenuetree |
| 24 | Avla | Cultivatedin garden | Deciduous | Medicinalfruits, VitaminC |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 25 | Avocado | Cultivated incourtyard | Evergreen | Ornamental, Fruitsedible |
| 26 | Babhul | -- | Semiarid&arid regiontree | For tannin &gum Calico printing |
| 27 | Bahava | Cultivatedin garden | Deciduous | Barkfortannin,seeds medicinal |
| 28 | Bakneem | Cultivated ingarden | Evergreen | Ornamental |
| 29 | Bakul | Cultivatedin garden | Evergreen | Ornamental |
| 30 | BalsamTree | Cultivatedin Garden | Evergreen | Ornamental |
| 31 | BarbedosCherry | Cultivatedin Garden | Evergreen | Ornamental |
| 32 | Bartondi(P) | -- | Evergreen | Rootsyielddye |
| 33 | Bartondic | Cultivatedin garden | Evergreen | FruitsMedicinal |
| 34 | Beheda | -- | Deciduous | FruitsusedinTriphala churna |
| 35 | Bel | -- | Deciduous | Leavesandfruits medicinal |
| 36 | BellBauhinia | Cultivatedin Garden | Evergreen | Ornamental |
| 37 | BenjaminTree | Cultivatedin Garden | Evergreen | Ornamental |
| 38 | Bhend | Garden& avenue | Evergreen | Fruitsyielddye |
| 39 | Bherlimad | Cultivatedin garden | Evergreenpalm | Plantpartsformultiple uses |
| 40 | Bhokar | -- | Evergreen | Fruitsusedas medicine |
| 41 | Bhorsal | -- | Deciduous | Medicinalplant |
| 42 | Bibba | -- | Evergreen | Seedsusedformaking linen |
| 43 | Bilambi | Cultivatedin wadi | Evergreen | Fruitsarepickled |
| 44 | Bitti | Cultivated ingarden | Evergreen | Ornamental |
| 45 | Bivla | -- | Evergreen | Timberyielding |
| 46 | Bondara | -- | Deciduous | Timberyielding |
| 47 | Bor | Cultivatedin garden | Evergreen | Ornamentalplant |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 48 | Bottlebrush | Garden &avenue | Evergreen | Ornamental |
| 49 | Bottlepalm | Garden& avenue | Evergreen | Avenuepalm |
| 50 | BrazilianPepper | Cultivatedin Garden | Evergreen | Ornamental |
| 51 | Calabashtree | Garden &avenue | Evergreen | Ornamentalplant |
| 52 | CassiaGrandis | Cultivatedin Garden | Evergreen | Ornamental |
| 53 | CassiaJavanica | Cultivatedin Garden | Evergreen | Ornamental |
| 54 | CassiaNodosa | Cultivated ingarden& avenue | Evergreen | Ornamental |
| 55 | Cassiarenigera | Cultivatedin Garden | Evergreen | Ornamental |
| 56 | Chanda | Garden& avenue | Deciduous | Ornamental |
| 57 | Chandan | Garden& avenue | Evergreen | YieldsSandalwoodOil |
| 58 | Chapha | Cultivatedin Garden | Evergreen | Ornamental |
| 59 | Chapha(a) | Cultivatedin garden | Deciduous | Ornamentalplant |
| 60 | Chapha(O) | Cultivatedin Garden | Evergreen | Ornamental |
| 61 | Chapha(T) | Cultivated ingarden | Deciduous | Ornamentalplant |
| 62 | CharcoalTree | -- | Evergreen | Barkyieldfibresused for ropes |
| 63 | Chari | SmallTree | Deciduous | Avenuetree |
| 64 | Charoli | Avenue | Deciduous | Seedsedible |
| 65 | Chenduphul | Garden& avenue | Evergreen | Ornamental |
| 66 | Chiknelimbu | Garden& avenue | Evergreen | Fruitsedible |
| 67 | Chiku | -- | Evergreen | Fruitsedible |
| 68 | ChinaiMendhi | Garden& avenue | Evergreen | Ornamental |
| 69 | Chinch | Garden& avenue | Evergreen | Podsedible,VitaminC |
| 70 | Chinesepalm | Garden | Evergreen | Ornamental |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 71 | ChotaTaman | Garden &avenue | Evergreen | Ornamental |
| 72 | Christmastree | Cultivatedin garden | Evergreen | Ornamental |
| 73 | Cupressus | Cultivatedin garden | Evergreen | Ornamental |
| 74 | Cycas | Cultivated ingarden | Deciduous | Ornamental |
| 75 | Dalbergiapaniculata | Cultivatedin garden | Evergreen | Ornamental |
| 76 | Dalchini | Cultivatedin garden | Evergreen | Barkusedinflavoring eatables |
| 77 | Dalimb | Gardenplant | Evergreen | Fruitsareedible |
| 78 | Dandus | -- | Deciduous | Timberyieldingtree |
| 79 | Datrang | -- | Evergreen | Leavesascattlefodder |
| 80 | Deshibadam | Garden& avenue | Deciduous | Fruitsedible |
| 81 | DevBabhul | Cultivatedin gardens | Deciduous | Fruitsmedicinal |
| 82 | Dhaman | -- | Evergreen | Fuelwood&timber |
| 83 | Dhatriphal | Garden& avenue | Evergreen | Ornamental |
| 84 | Dhavda | Garden& avenue | Deciduous | Ornamental |
| 85 | Dikemali | Garden& avenue | Evergreen | Ornamental |
| 86 | Dombeya | Garden &avenue | Evergreen | Ornamental |
| 87 | F.tsiela | Gardens& avenue | Evergreen | Ornamental |
| 88 | Fanpalm | Cultivatedin garden | | -- |
| 89 | Ferntree | Garden &avenue | Evergreen | Ornamental |
| 90 | FicusNitida | Cultivatedin garden | Evergreen | Ornamental |
| 91 | Ficusparasitica | Garden& avenue | Evergreen | Avenue |
| 92 | Ficusvirens | Cultivatedin garden | Evergreen | -- |
| 93 | foxtailpalm | Garden& avenue | Evergreen | Ornamental |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 94 | Ganapatytree | Cultivated ingarden | Evergreen | -- |
| 95 | Gela | Forestplant | Evergreen | Avenuetree |
| 96 | Giripushpa | Cultivatedin garden | Deciduous | Greenmanure |
| 97 | Gondni | Garden &avenue | Evergreen | Ornamental |
| 98 | GorakhChinch | Trunk oflargedia meter nearbase | Deciduous | Fruits medicinal,Kernels areeaten |
| 99 | GulabiJamb | Gardens& avenue | Semievergreen | Fruitsedible |
| 100 | Gulmohar | Gardens& avenue | Deciduous | Ornamental |
| 101 | H.brasilensis | Cultivatedin wadi | Evergreen | Sapisusedinmaking rubber |
| 102 | Haldu | Forestplant | Deciduous | Barkmedicinal |
| 103 | Hansoli | Forestplant | Evergreen | Avenuetree |
| 104 | Hirda | Garden& avenue | Deciduous | Fruitsuse inAyurved |
| 105 | Humb | Forestplant | Deciduous | Avenue |
| 106 | Idlimbu | Cultivatedin garden | Evergreen | Edible fruits |
| 107 | Indianrubbertree | Gardenplant | Evergreen | Timberyieldingtree |
| 108 | Ixoraarborea | Forestplant | Evergreen | Avenue |
| 109 | Ixorabrachiata | Forestplant | Evergreen | Avenue |
| 110 | Jaiphal | Cultivatedin garden | Evergreen | Fruitsmedicinal |
| 111 | Jamalgota | Cultivatedin garden | Evergreen | Seedsmedicinal |
| 112 | Jamb | Cultivatedin garden | Evergreen | Fruitsedible |
| 113 | Jambha | Cultivatedin garden | Deciduous | -- |
| 114 | Jambhul | Gardenplant | Evergreen | Fruits medicinal &edible |
| 115 | JungliBadam | Garden& avenue | Deciduous | Ornamental &avenue |
| 116 | Kadamb | Garden& avenue | Evergreen | Ornamental |
| 117 | Kadipatta | Garden &avenue | Evergreen | Ornamental |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 118 | Kaduneem | Avenue | Semievergreen | All parts are usedmedicinally |
| 119 | Kahandol | Cultivatedin garden | Deciduous | Timberyielding |
| 120 | Kailashpati | Cultivatedin garden | Deciduous | Ornamental |
| 121 | Kajra | Forestplant | Evergreen | Seedsmedicinal |
| 122 | Kaju | -- | Semideciduous | Nuts,avaluabledry fruit |
| 123 | Kakad | Garden& avenue | Deciduous | Fruitsedible |
| 124 | KalaKuda | Cultivated ingarden | Evergreen | Timber yielding,seedsmedicinal |
| 125 | Kalaumber | -- | Evergreen | -- |
| 126 | Kalamb | Garden& avenue | Evergreen | Timberyieldingplant |
| 127 | Kanakchampa | Cultivated ingarden | Semideciduous | Timber yielding &ornamental |
| 128 | Kanchan | Garden& avenue | Evergreen | Ornamental |
| 129 | Kapur | Cultivatedin garden | Evergreen | Ornamental |
| 130 | Karambol | Cultivatedin wadi | Evergreen | Rawfruitspickledripe oneeaten |
| 131 | Karanj | Avenue | Deciduous | Fruitsare medicinal |
| 132 | Karmal | Cultivated ingarden | Evergreen | Raw fruits pickled,Ripe one eaten as desert |
| 133 | Karvat | Cultivated ingarden | Evergreen | Tannin yielding |
| 134 | Kashid | Garden& avenue | Evergreen | Ornamental |
| 135 | Katesavar | -- | Deciduous | Tannin yielding |
| 136 | Kavas | Garden &avenue | Deciduous | Ornamentalplant |
| 137 | Kavath | Garden& avenue | Evergreen | Fruitsareedible |
| 138 | Kavtichapha | Garden& avenue | Evergreen | Ornamentalplant |
| 139 | Khair | -- | Tree of arid &semiarid,Deciduous | Source of catechufrom heart woodmedicinal |
| 140 | Kharoti | Gardenplant | Evergreen | Timberyieldingplant |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 141 | Khaya | Gardenplant | Evergreen | Timberyieldingplant |
| 142 | Khejdi | -- | Evergreen | Branchesused as toothbrush |
| 143 | Khirni | Garden& avenue | Evergreen | Fruitsedible |
| 144 | Kinai | Garden &avenue | Deciduous | Avenue |
| 145 | Kleinhovia | Garden& avenue | Deciduous | Avenue |
| 146 | Kokam | Garden& avenue | Evergreen | Fruitbutter medicinal |
| 147 | Kuda | Cultivated ingarden | Evergreen | Leaves used asmedicine |
| 148 | Kumb | Forestplant | Evergreen | Avenue |
| 149 | Kumkum | Cultivatedin garden | Semideciduous | Seedusedfor obtainingdye |
| 150 | Kunti | Cultivated ingarden | Evergreen | Ornamental |
| 151 | Kusum | Forestplant | Deciduous | Avenue |
| 152 | Kydiacalycina | Forestplant | Deciduous | Avenue |
| 153 | Lalchapha | Garden& avenue | Deciduous | Ornamentalplant |
| 154 | Lal Jamb | Cultivatedin orchard | Deciduous | Cultivatedforitsfruits |
| 155 | Lavang | Cultivatedin garden | Evergreen | Medicinalplant |
| 156 | LaxmiTaru | Garden &avenue | Evergreen | Ornamental |
| 157 | Lettuce tree | Cultivatedin garden | Evergreen | Ornamentalplant |
| 158 | Limbu | Cultivatedin garden | Evergreen | Squash,Sharbat& VitaminC |
| 159 | Litchi | Cultivated inorchard | Evergreen | Fruitsedible |
| 160 | Litsea | Forestplant | Deciduous | Avenue |
| 161 | Lokhandi | Cultivatedin garden | Evergreen | Ornamentaltree |
| 162 | LongLeafedFig | Garden &avenue | Evergreen | Ornamental |
| 163 | Madhucalongifolia | Forestplant | Deciduous | Fruitusein medicine |
| 164 | Maharukh | Avenue | Deciduous | Woodusedfor various purposes |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 165 | Mahogani | Cultivated ingarden | Evergreen | Timberyieldingplant |
| 166 | Mahua | Garden | Deciduous | Timberyielding |
| 167 | Mamphal | Cultivatedin garden | Evergreen | Fruitsedible |
| 168 | Markhamia | Garden &avenue | Deciduous | Ornamental |
| 169 | Mayurpankhi | Cultivatedin garden | Evergreen | Ornamental |
| 170 | Moglierand | Cultivatedin garden | Deciduous | Seedsmedicinalbio dieselplant |
| 171 | Mosambi | Cultivated infarm | Evergreen | Edible fruits |
| 172 | Mothakarmal | Cultivatedin garden | Deciduous | -- |
| 173 | Nana | Cultivatedin garden | Evergreen | -- |
| 174 | Naral | Avenue | Evergreenpalm | Allpartsare economicallyuseful |
| 175 | Narikel | Garden& avenue | Deciduous | Ornamental & roadsideplant |
| 176 | Naringi | Gardens& avenue | Evergreen | Fruitsareedible |
| 177 | Nilgiri | Gardens& avenue | Evergreen | Volatile oil,paper industry |
| 178 | Nilmohar | Gardens& avenue | Deciduous | Ornamental |
| 179 | Nirphanas | Cultivatedin garden | Evergreen | Fruitedibleafter boiling |
| 180 | Otamb | Cultivatedin garden | Evergreen | Ornamental |
| 181 | Padal | Gardens &avenue | Evergreen | Rootsmedicinal |
| 182 | Palas | -- | Deciduous | Flowers&seeds medicinal |
| 183 | Pandharakhair | -- | Deciduous | -- |
| 184 | Pangara | Beautifu lflowers, avenue | Deciduous | Timber yield ,barkyieldfibre |
| 185 | Papanas | Cultivatedin garden | Evergreen | Edible fruits |
| 186 | Parijatak | Cultivatedin garden | Semievergreen | Medicinal,Ornamental |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 187 | Payar | Forestplant | Deciduous | Ornamentalplant |
| 188 | Pendri | Cultivatedin garden | Evergreen | Ornamentalplant |
| 189 | Peru | Cultivatedin garden | Evergreen | Fruitsedible |
| 190 | Petari | Cultivated ingarden | Evergreen | Timber yielding,rootsmedicina lly |
| 191 | Phalsa | Cultivatedin garden | Evergreen | Fruitsareused in makingkala Khata |
| 192 | Phanas | Cultivatedin courtyard | Evergreen | Deliciousfleshy pericarpeaten |
| 193 | Phoenixroebelenii | Gardens &avenue | Evergreen | Ornamental |
| 194 | Pichkari | Cultivatedin garden | Semideciduous | Ornamentalbark medicinal |
| 195 | Pimpal | Avenue | Deciduous | Ornamental |
| 196 | PinkTabebuia | Gardens &avenue | Deciduous | Avenue |
| 197 | Pipli | -- | Evergreen | Ornamental |
| 198 | Putranjiva | Garden& avenue | Evergreen | Ornamentalplant |
| 199 | Raiavla | Cultivated ingarden | Deciduous | Edible fruits |
| 200 | Raintree | Garden& avenue | Evergreen | Wood astimber |
| 201 | Raktachandan | Cultivatedin garden | Evergreen | Medicinalplant |
| 202 | Ramphal | Cultivated ingarden | Small evergreentree | Wood astimber |
| 203 | Ranchiku | Cultivatedin garden | Evergreen | -- |
| 204 | Ratangunj | Ornamental | Deciduous | Ornamental |
| 205 | Ritha | -- | Evergreen | Fruits are usedmedicinally |
| 206 | Rudraksha | Garden &avenue | Evergreen | Fruits are beaded &worn by Saints& Sanyasis |
| 207 | Sag | Social forestryplant | Deciduous | Timberyieldingplant |
| 208 | Samudraphal | Garden &avenue | Evergreen | Ornamentalplant |
| 209 | Santra | Cultivatedin orchard | Deciduous | Cultivatedforitsfruits |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 210 | Saptparni | Garden &avenue | Evergreen | Barkmedicinal |
| 211 | Sausagetree | Garden& avenue | Evergreen | Ornamental |
| 212 | Savar | Garden& avenue | Deciduous | Ornamentalplant |
| 213 | Scarletcordia | Cultivated ingarden | Evergreen | Ornamental |
| 214 | Shami | Garden& avenue | Evergreen | Avenue |
| 215 | Shankasur | Cultivatedin garden | Evergreen | Ornamental |
| 216 | Shemat | -- | Deciduous | Timber |
| 217 | Shendri | Cultivatedin garden | Evergreen | SeedsyieldsArnatto Dye |
| 218 | Sher | Cultivatedin garden | Evergreen | Medicinalplant |
| 219 | Shevga | Cultivatedin wadi | Evergreen | Medicinalplant |
| 220 | Shindi | Garden& avenue | Evergreen | Toddyfrom plantsap |
| 221 | Shirish | Avenue | Deciduous | Woodexcellent for furniture |
| 222 | Shivan | Cultivatedin garden | Semideciduous | Timber& Medicinal plant |
| 223 | Silveroak | Garden& avenue | Evergreen | Timberyieldingplant |
| 224 | Singapurcherry | -- | Evergreen | Fruitsedible |
| 225 | Sisam | Avenue | Deciduous | Timberyieldingtree |
| 226 | Sisvi | Garden& avenue | Deciduous | Timberyieldingtree |
| 227 | Sitaphal | Cultivatedin courtyard | Evergreen | Fruitswith flavoured,sweetflesh |
| 228 | SmallLeafMahogany | Garden& avenue | Evergreen | Timberyieldingplant |
| 229 | Sonchapha | Cultivatedin garden | Evergreen | Ornamental |
| 230 | Sonmohar | Garden& avenue | Evergreen | Ornamental |
| 231 | StarApple Tree | Garden& avenue | Evergreen | Ornamental |
| 232 | Sterculiaguttata | Cultivatedin garden | Deciduous | -- |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 233 | Subabhul | -- | Evergreen | Fuelwood |
| 234 | Supari | Ornamental, avenue | Evergreenpalm | Ediblenutsas masticatory |
| 235 | Surangi | Garden& avenue | Evergreen | Ornamental |
| 236 | Suru | Gardens andsea coast | Sand-binder, checkserosion | Wood astimber |
| 237 | T.argentea | Cultivatedin garden | Deciduous | Ornamental |
| 238 | TabebuiaRosea | Cultivatedin garden | Deciduous | Ornamental |
| 239 | Tabernaemontanaheyn | Cultivated ingarden | Deciduous | Ornamental |
| 240 | Tad | -- | Tallevergreenpalm | Fruitsedible |
| 241 | Tamalpatra | Cultivatedin garden | Evergreen | Leavesascondiment |
| 242 | Taman | Garden &avenue | Deciduous | Ornamental |
| 243 | TambadaKuda | Forestplant | Deciduous | -- |
| 244 | Tembhurni | Garden& avenue | Evergreen | Ornamental |
| 245 | Tendu | Forestplant | Deciduous | Leafuse in Bidi |
| 246 | Tetu | Cultivatedin garden | Ornamentalplant | Medicinal |
| 247 | Tuti | Cultivatedin garden | Evergreen | Fruitsedible |
| 248 | Umber | Gardenplant | Evergreen | Medicinalplant |
| 249 | Umbrellatree | Umbrellalike leafarrangement | Evergreen | Medicinalplant |
| 250 | Undi | Cultivatedin garden | Evergreen | Ornamental |
| 251 | Vad | Garden& avenue | Evergreen | Latex,bark,leaves medicinal |
| 252 | Vaivarna | Garden& avenue | Deciduous | Medicinalplant |
| 253 | Varas | Garden& avenue | Deciduous | Timberyieldingplant |
| 254 | Vavla | Garden &avenue | Deciduous | Timberyieldingplant |
| 255 | VilayatiBabhul | Potential avenue | Largephyllode | Forenergyplantation |

| S. N. | LocalName | Aesthetic | Ecological | Economic |
|---|---|---|---|---|
| 256 | Vilayatichinch | Garden &avenue | Evergreen | Fruits edible, hedgeplant |
| 257 | VilayatiKikar | Garden& avenue | Evergreen | Ornamental |
| 258 | Yellowsilkcottont | Garden& avenue | Deciduous | Ornamental |
| 259 | Unidentified | | | |

## Annexure3:NativeTrees

| S. N. | TreeName | BotanicalName | Family |
|---|---|---|---|
| 1 | Supari | *Arecacatechu*Linn. | Arecaceae |
| 2 | Naral | *Cocosnucifera*Linn. | Arecaceae |
| 3 | Kala umber | *Ficushispida*Linn.f. | Moraceae |
| 4 | Amba | *Mangiferaindica*Linn. | Anacardiaceae |
| 5 | Kharoti | *Streblusasper*Lour. | Moraceae |
| 6 | Shevga | *Moringapterigosperma*Gaertn. | Moringaceae |
| 7 | Asupalav(D) | *Polyalthialongifoliavar.pendula* (Sonn.)Thw. | Annonaceae |
| 8 | Tad | *Borassusflabellifer*Linn. | Arecaceae |
| 9 | Dhatriphal | *Barringtoniaacutangula*(Linn.) Gaertn. | Lecythidaceae |
| 10 | Bhend | *Thespesiapopulnea*(Linn.)Sol.ex Cor. | Malvaceae |
| 11 | Karanj | *Pongamiapinnata*(Linn.)Pierre | Fabaceae |
| 12 | Phanas | *Artocarpusheterophyllus*Lamk. | Moraceae |
| 13 | Kaduneem | *Azadirachtaindica*(Linn.)A.Juss. | Meliaceae |
| 14 | Katesavar | *Bombaxceiba*Linn. | Bombacaceae |
| 15 | Shindi | *Phoenixsylvestris*(Linn.)Roxb. | Arecaceae |
| 16 | Akashneem | *Millingtoniahortensis*Linn.f. | Bignoniaceae |
| 17 | Jambhul | *Syzygiumcuminii*(Linn.)Skeels | Myrtaceae |
| 18 | Bherlimad | *Caryotaurens*Linn. | Arecaceae |
| 19 | Kadipatta | *MurrayaKoenigii* | Rutaceae |
| 20 | Umber | *Ficusracemosa*Linn. | Moraceae |
| 21 | Dhaman | *Grewiatiliaefolia*Vahl. | Tiliaceae |
| 22 | Asana | *Brideliaretusa*(Linn.)Spreng. | Euphorbiaceae |
| 23 | Sonmohar | *Peltophorumpterocarpum*(DC.) Bk.exHyn | Caesalpiniaceae |
| 24 | Asupalav (S) | *Polyalthialongifolia*(Sonn.)Thw. | Annonaceae |
| 25 | Sonchapha | *Michelliachampaca*Linn. | Magnoliaceae |
| 26 | Ankul | *Alangiumsalvifolium*(Linn.f.) Wangerin | Alangiaceae |
| 27 | Bhokar | *Cordiadichotoma*Forst.f. | Boraginaceae |
| 28 | Ambada | *Spondiaspinnata*(Linn.f.)Kurz | Anacardiaceae |
| 29 | Otamb | *Artocarpuslakoocha*Roxb. | Moraceae |
| 30 | Rai Avla | *Ciccaacida*Linn. | Euphorbiaceae |
| 31 | Kakad | *Garugapinnata*Roxb. | Burseraceae |
| 32 | Vavla | *Holoptelaintegrifolia*(Roxb.)Planch | Urticaceae |
| 33 | Apta | *Bauhiniaracemosa*Lamk. | Caesalpiniaceae |
| 34 | Saptparni | *Alstoniascholaris*(Linn.)R.Br. | Apocynaceae |
| 35 | Tuti | *Morusalba*Linn. | Moraceae |

| S. N. | TreeName | BotanicalName | Family |
|---|---|---|---|
| 36 | Bartondi(P) | *Morindapubesence*Sm. | Rubiaceae |
| 37 | Pimpal | *Ficusreligiosa*Linn. | Moraceae |
| 38 | Petari | *Trewianudiflora*Linn. | Euphorbiaceae |
| 39 | Shemat | *Lanneacoromandelica*(Houtt.) Merrill | Anacardiaceae |
| 40 | Kuda | *Wrightiatinctoria*(Roxb.)R.Br. | Apocynaceae |
| 41 | JungliBadam | *Sterculiafoetida*Linn. | Sterculiaceae |
| 42 | Ain | *Terminaliacrenulata*Roth. | Combretaceae |
| 43 | Kumkum | *Mallotusphilipinensis*(Lamk.) Muell.-Arg. | Euphorbiaceae |
| 44 | Tetu | *Oroxylumindicum*(Linn.)Vent. | Bignoniaceae |
| 45 | Vad | *Ficusbenghalensis*Linn. | Moraceae |
| 46 | Pandharakhair | *Acaciaferruginea*DC. | Mimosaceae |
| 47 | Khair | *Acaciacatechuoides*(Roxb.)Benth. | Mimosaceae |
| 48 | Palas | *Buteamonosperma*(Lamk.) Kuntze | Fabaceae |
| 49 | Parijatak | *Nyctanthusarbor-tristis*Linn. | Oleaceae |
| 50 | Lokhandi | *Ixoraparviflora*Lamk. | Rubiaceae |
| 51 | Pangara | *Erythrinavariegatavarorientalis* (Linn.)Merrill | Fabaceae |
| 52 | Avla | *Emblicaofficinalis*Gaertn. | Euphorbiaceae |
| 53 | Beheda | *Terminaliabellirica*(Gaertn.)Roxb. | Combretaceae |
| 54 | Moha | *Madhucaindica*Gmel. | Sapotaceae |
| 55 | Shivan | *Gmelinaarborea*Roxb. | Verbenaceae |
| 56 | Bahava | *Cassiafistula*Linn. | Caesalpiniaceae |
| 57 | Bel | *Aeglemarmelos*(Linn.)Correa | Rutaceae |
| 58 | Bivla | *Pterocarpusmarsupium*Roxb. | Fabaceae |
| 59 | Atrun | *Flacourtiamontana*Graham | Flacourtiaceae |
| 60 | Arjun | *Terminaliaarjuna*(Roxb.)Wt&Arn. | Combretaceae |
| 61 | Ritha | SapindusemarginatusVahl. | Sapindaceae |
| 62 | Vaivarna | *Crataevatapia*Linn. | Capparidaceae |
| 63 | Sisam | *Dalbergiasissoo*Roxb.ex.DC. | Fabaceae |
| 64 | Kahandol | *Sterculiaurens*Roxb. | Sterculiaceae |
| 65 | Humb | *Milliusatomentosa(Roxb.)Sinclair* | Annonaceae |
| 66 | Bakul | *Mimusopselengi*Linn. | Sapotaceae |
| 67 | Khirni | *Manilkarahexandra*(Roxb.)Dubard | Sapotaceae |
| 68 | Shirish | *Albizzialebbeck*(Linn.)Willd. | Mimosaceae |
| 69 | Chari | *Casearia*ellipticaWilld. | Flacourtiaceae |
| 70 | Tamalpatra | *Cinnamomumtamala*Nees& Eberm. | Lauraceae |
| 71 | Putranjiva | *Drypetesroxburghii*(Wall.)Hurus. | Euphorbiaceae |
| 72 | Nirphanas | *Artocarpusincisa*Linn.f. | Moraceae |

| S. N. | TreeName | BotanicalName | Family |
|---|---|---|---|
| 73 | Kadamb | *Neolamarkianacadamba*(Roxb.) Bosser. | Rubiaceae |
| 74 | Kokam | *Garciniaindica*(Thou.)Chois. | Clusiaceae |
| 75 | Samudraphal | *Barringtoniaasiatica*(Linn.)Kurz. | Lecythidaceae |
| 76 | Kanakchampa | *Pterospermumacerifolium*(Gaertn.) Willd. | Sterculiaceae |
| 77 | Taman | *Lagerstroemiaspeciosa*(Linn.)Pers | Lythraceae |
| 78 | Kalamb | *Mitragynaparvifolia*(Roxb.)Korth | Rubiaceae |
| 79 | Kumb | *Careyaarborea*Roxb. | Lecythidaceae |
| 80 | Alu | *Meynaspinosa*Roxb.exLink | Rubiaceae |
| 81 | Haldu | *Haldiniacordifolia*(Roxb.)Ridsdale | Rubiaceae |
| 82 | Kala Kuda | *Holarrhenaantidysenterica*(Roth)A. DC.Kurchi | Apocynaceae |
| 83 | Bibba | *Semecarpusanacardium*Linn.f. | Anacardiaceae |
| 84 | Tendu | *Diospyrosmelanoxylon*Roxb. | Ebenaceae |
| 85 | Dev Babhul | *Acaciafarnesiana(Linn.)Willd.* | Mimosaceae |
| 86 | Dalchini | *Cinnamomumverum* | Lauraceae |
| 87 | F tsiela | *Ficustsiela*Roxb. | Moraceae |
| 88 | Varas | *Heterophragma quadriloculare*(Roxb.)K.Schum. | Bignoniaceae |
| 89 | Dandus | *Dalbergialanceolaria*Linn.f. | Fabaceae |
| 90 | Surangi | *Mammealongifolia*Planch.&Triana | Clusiaceae |
| 91 | Kavas | *Firmianacolorata*(Roxb.)Br. | Sterculiaceae |
| 92 | Mahogani | *Swetiniamacrophylla*King | Meliaceae |
| 93 | Padal | *Stereospermumchelonoides*(Linn.f.) DC. | Bignoniaceae |
| 94 | Kusum | *Schleicheriaoleosa*(Lour.)Oken | Sapindaceae |
| 95 | Chandan | *Santalumalbum*Linn. | Santalaceae |
| 96 | Datrang | *Ehretialaevis*Roxb. | Ehretiaceae |
| 97 | Chanda | *Macarangapeltata*Muell.-Arg. | Euphorbiaceae |
| 98 | Ixorabrachiata | *Ixorabrachiata*Roxb.exDC | Rubiaceae |
| 99 | Karvat | *Ficusaperima*Roxb. | Moraceae |
| 100 | Ashok | *Saracaasoka*(Roxb.)deWillde | Caesalpiniaceae |
| 101 | Sisvi | *Dalbergialatifolia*Roxb. | Fabaceae |
| 102 | Madhucalongifolia | *Madhucalongifoliavar latifolia*(Koenig)McBride | Sapotaceae |
| 103 | ChinaiMendhi | *LagerstroemiaindicaLinn.* | Lythraceae |
| 104 | Jaiphal | *Myristicafragrans*Linn. | Myristicaceae |
| 105 | Asupalav(M) | *Polyalthialongifolia*(Sonn.)Thw. var*angustifolia* | Annonaceae |
| 106 | Dalbergiapaniculata | *DalbergiapaniculataRoxb.* | Fabaceae |
| 107 | Bhorsal | *Hymenodictyonorixense(Roxb.) Mabberley* | Rubiaceae |

| S. N. | TreeName | BotanicalName | Family |
|---|---|---|---|
| 108 | Kavath | *Feronialimonia*(Linn.)Swingle | Rutaceae |
| 109 | Dikemali | *Gardeniaresinifera*Roth | Rubiaceae |
| 110 | Karmal | *Dilleniaindica*Linn. | Dilleneaceae |
| 111 | Shami | *Prosopiscineraria*(Linn.)Druce | Mimosaceae |
| 112 | Payar | *Ficusarnottiana*(Miq.)Miq. | Moraceae |
| 113 | Nana | *Lagerstroemiaparviflora*Roxb. | Lythraceae |
| 114 | Jambha | *Xyliaxylocarpa*(Roxb.)Taub. | Mimosaceae |
| 115 | Charoli | *BuchananialanzenSpreng.* | Anacardiaceae |
| 116 | Phalsa | *Grewiaasiatica*Linn. | Tiliaceae |
| 117 | ChotaTaman | *Lagerstroemiathoreli*Gagnepin | Lythraceae |
| 118 | Kajra | *Strychnousnux-vomica*Linn. | Loganiaceae |
| 119 | Tembhurni | *Diospyrosmalabarica*(Desr.)Kostel | Ebenaceae |
| 120 | Rudraksha | *Elaeocarpussphaericus*(Gaertn)K Schum | Elaeocarpaceae |
| 121 | Litsea | *Litseainvolucrata*(Retz.)Almeida | Lauraceae |
| 122 | Pendri | *Catunaregamuliginosa(Retz.) Sivaranjan* | Rubiaceae |
| 123 | Pipli | *Ficusinfectoria*Roxb. | Moraceae |
| 124 | Tambada Kuda | *Wrightiaarborea*(Dennst.) Mabberley | Apocynaceae |
| 125 | Bondara | *Lagerstroemialanceolata*Wall. | Lythraceae |
| 126 | Ficusparasitica | *Ficusparasitica*Koen.exWilld | Moraceae |
| 127 | Gela | *Catunaregamspinosa*(Thunb.) Tiruveng | Rubiaceae |
| 128 | Hansoli | *Microcospaniculata*Linn. | Tiliaceae |
| 129 | Ixoraarborea | *Ixorapavetta*Andrews | Rubiaceae |
| 130 | Raktachandan | PterocarpussantalinusLinn.F. | Fabaceae |
| 131 | Tabernaemontana | *Ervatamiaalternifolia*(Linn.) Almeida | Apocynaceae |
| 132 | Yellowsilkcottontree | *Cochlospermumreligiosum*(Linn.) Alston | Cochlospermaceae |
| 133 | Chiknelimbu | *Triphasiatrifolia*(Burm.f.)Wils. | Rutaceae |
| 134 | Kapur | *Cinnamomumcamphora*(L.)Sieb. | Lauraceae |
| 135 | Acacialeucophloea | *Acacialeucophloea*(Roxb.)Willd. | Mimosaceae |
| 136 | Dhavda | *Anogeisuslatifolia*(Roxb.ExDC.) Guillemin&Perottet | Combretaceae |
| 137 | Ficus Nitida | *Ficusnitida*Thunb. | Moraceae |
| 138 | Hirda | *Terminaliachebula*Retz. | Combretaceae |
| 139 | Kydiacalycina | *KydiacalycinaRoxb.* | Malvaceae |
| 140 | Lavang | *Syzygiumaromaticum*(Linn.) Merrill&Perry | Myrtaceae |

**Annexure4:TreespeciessuggestedforRoadsideandIndustrialPremises**

| S. N. | BotanicalNames | Family | CommonName | Pollutant |
|---|---|---|---|---|
| 1 | *Acacianilotica* | Fabaceae | Babhul | SO2, Flyash |
| 2 | *Aeglemarmelos* | Rutaceae | Bel | SPM, SO2, NO2 |
| 3 | *Alstoniascholaris* | Apocynaceae | Saptparni | SPM, SO2, NO2 |
| 4 | *Artocarpusheterophyllus* | Moraceae | Phanas | SPM, SO2, NO2 |
| 5 | *Azadirachtaindica* | Meliaceae | Neem | SO2 |
| 6 | *Cassiasiamea* | Fabaceae | Kashid | SPM,SO2 |
| 7 | *Cordiadichotoma* | Boraginaceae | Bhokar | SPM |
| 8 | *Dalbergiasissoo* | Fabaceae | Sisam | SO2 |
| 9 | *Ficusbenghalensis* | Moraceae | Vad | SPM, SO2, NO2 |
| 10 | *Ficusreligiosa* | Moraceae | Pimpal | SPM, SO2, NO2 |
| 11 | *Lagerstroemiaspeciosa* | Lytraceace | Taman | Dust |
| 12 | *Mangiferaindica* | Anacardiaceae | Amba | SPM,NO2 |
| 13 | *Mimusopselengi* | Sapotaceae | Bakul | SPM, SO2, NO2 |
| 14 | *Peltophorumpterocarpum* | Fabaceae | Sonmohar | SPM |
| 15 | *Phoenixsylvestris* | Arecaceae | Shindi | SPM |
| 16 | *Pithecolobiumdulce* | Fabaceae | Vilayatichinch | SO2 |
| 17 | *Plumeriaalba* | Apocynaceae | Chapha | SO2 |
| 18 | *Saracaasoka* | Fabaceae | Ashok | Dust |
| 19 | *Sesbaniasesban* | Fabaceae | Agasti | SO2 |
| 20 | *Tamarindusindica* | Fabaceae | Chinch | SPM, SO2, NO2 |

**Annexure5:TreespeciessuitableforPark**

| S. N. | BotanicalNames | Family | CommonName |
|---|---|---|---|
| 1 | *Albizialebbeck* | Fabaceae | Shirish |
| 2 | *Buteamonosperma* | Fabaceae | Palas |
| 3 | *Careyaarborea* | Lecythidaceae | Kumbha |
| 4 | *Cassiafistula* | Fabaceae | Bhava |
| 5 | *Couropitaguianensis* | Lecythidaceae | Kailaspati |
| 6 | *Dalbergialanceolaria* | Fabaceae | Dandus |
| 7 | *Dilleniapentagyna* | Dilleniacea | Karmal |
| 8 | *Gardeniajasminoides* | Rubiaceae | Anant |
| 9 | *Meliaazardirach* | Meliaceae | Bakneem |
| 10 | *Millingtoniahortensis* | Bignoniaceae | Akashneem |
| 11 | *Mimusopselengi* | Sapotaceae | Bakul |
| 12 | *Nyctanthesarbor-tristis* | Oleaceae | Praijatak |
| 13 | *Saracaasoka* | Fabaceae | Ashok |
| 14 | *Thespesiapopulnea* | Malvaceae | Bhend |

**Annexure6:TreespeciessuitableforGovernmentandPrivatePremises**

| S. N. | BotanicalNames | Family | LocalName |
|---|---|---|---|
| 1 | *Aphanomyxispolystachya* | Meliaceae | Rohitak |
| 2 | *Artocarpusheterophyllus* | Moraceae | Phanas |
| 3 | *Dilleniapentagyna* | Dilleniaceae | Karmal |
| 4 | *Diospyrosmelanoxylon* | Ebenaceae | Tendu |
| 5 | *Drypetesroxburghii* | Euphorbiaceae | Putranjiva |
| 6 | *Ficusbenghalensis* | Moraceae | Vad |
| 7 | *Ficus elastica* | Moraceae | IndianRubberTree |
| 8 | *Ficusreligiosa* | Moraceae | Pimpal |
| 9 | *Holopteliaintegrifolia* | Ulmaceae | Vavla |
| 10 | *Madhucalongifolia* | Sapotaceae | Mahua |
| 11 | *Mammeasuriga* | Clusiaceae | Surangi |
| 12 | *Mangiferaindica* | Anacardiaceae | Amba |
| 13 | *Manilkarahexandra* | Sapotaceae | Khirni |
| 14 | *Schleicheraoleosa* | Sapindaceae | Kusum |
| 15 | *Syzigiumcumini* | Myrtaceae | Jambul |
| 16 | *Terminaliabellerica* | Combretaceae | Beheda |
| 17 | *Terminaliachebula* | Combretaceae | Chebula |

Ahmednagar Municipal Corporation Ahmednagar

Dy. Commissioner
Ahmednagar Corporation, Ahmednagar