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**Suitable Species
for
Urban Forestry
3b**

Foreword

Urban forestry is the care and management of tree populations in urban settings for the purpose of improving the urban environment. Urban forestry advocates the role of trees as a critical part of the urban infrastructure.

With an extensive and healthy urban forest, air quality can be drastically improved. Trees help to lower air temperature and lesser urban heat island effect in urban areas. This reduction of temperature not only lowers energy use, it also improves air quality, as the formation of ozone is dependent on temperature. It also helps increase wildlife population, and mitigates the overall urban environmental impact.

These two issues (Vol. 18, no. 2 and no. 3) of RISE have been reproduced based from DENR Recommends on Suitable Species for Urban Forestry. These issue are intended to provide information for people, especially urban planners, on what species of trees or plants are suitable for urban forestry. It contains information on species distribution, characteristics, site requirements, uses and propagation techniques.

May our readers find these issues informative and useful.



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Suitable Species for Urban Forestry

The urban forest exists in an environment dominated by people. This forest establishes itself in small spaces available after all the necessary urban structures are built. It survives the unfavorable environment, like compacted soils and polluted air.

The Master Plan for Forestry Development of DENR (1990) defines urban forestry as:

- the establishment and management of forests in urban environments for the physiological and psychological well-being of the people;
- a deliberate process of cultivating trees, shrubs or ornamental plants to offset the effects of pollution and at the same time provide aesthetic and scenic surroundings in an otherwise drab and dreary landscape of concrete and steel structures, asphalt roads, walks, parking lots and shanties along the railroad tracks;
- a forest park, a nature center, a greenbelt, a boulevard lines with trees or flowering plants or even coconuts; a street with trees and other plants in the island or sidewalks; a vacant lot planted to trees and other green plants; and a school, or a hospital, or a factory yard with trees; or
- a greening movement, a people-oriented forestry designed to raise the quality of the environment of the people in urban centers.

Rationale for its Establishment

Letter of Instruction No. 1312 issued in 1983, mandated the establishment of forest or tree parks, greenbelts and other tourist attractions to:

- enhance the beauty and improve the ecosystems of our communities thus, providing the populace with a healthy and wholesome environment and a place for rest and recreation;
- make the people increasingly appreciate the need to preserve forests and restore, at the earliest possible time, our denuded areas.

Major urban forestry planting sites and areas:

- **roadways** – these are along major thoroughfares such as expressways, diversion roads, highways and secondary access roads.
- **national parks and mini-forest parks** – these are areas where people usually converge to rest and hold social gatherings or celebrations. These may be city-municipal/barangay parks and established national parks.
- **greenbelts** – these are areas when planted serve as environmental pollution buffer or filters. These include public plazas, subdivisions, school and public grounds, or government compounds.

- **commercial and industrial compounds** – these are fenced or walled-in areas containing business establishments.

Classification of plants suitable for urban ecosystem

Trees and plants for establishment in urban forest are chosen to grow and surpass the condition of the particular site. They must be adaptable to a particular hardiness zone and should possess suitable morphological characteristics and forms for very small spaces. The root system should penetrate in restricted soil spaces surrounded mainly with concrete/asphalt and underground transmission lines and utilities.

Poisonous gases and particulates abound in the air of urban sites. Planting of trees and other species that can tolerate gaseous pollutants is desirable. And only species with numerous stomates can absorb more air pollutants.

Particulate pollutant removal capability of vegetation is greatly affected by its morphological make-up. Plants with modified parts like hairy leaves, twigs and petioles trap particles more easily than smooth-textured plants. Trees with a high ratio of surface area to volume of foliage, such as conifers, remove more particles per ground area per unit of time than trees with a low ration. Coniferous and deciduous species with abundant branch and twig structures provide particulate removal during cold months.

Plants in relation to resistance to air pollution are classified as follows:

- **Highly-Resistant Plant Species** are those which show zero or almost zero percent injury and can naturally grow well even after exposure to high traffic density areas.
- **Moderately-Resistant Species** are those that show only up to 20% injury per plant. Injury symptoms include discoloration of the leaves, defoliation and presence of foliar pests and diseases.
- **Non-resistant Plant Species** are those that exhibit more than 50% injury per plant when exposed to polluted environment. Some plants totally shed their leaves and perform very poorly in areas where air pollution has worsened due to excessive emittance of exhaust gases from motor vehicles and factories.

Urban planners, therefore must carefully choose tree/plant species suitable to an environment which is hostile to its growth and survival. They must know the species' basic needs, site treatment and the appropriate maintenance for the success of the urban forestry scheme.

This refopacket may serve as a guide for people, especially urban planners, on what species of trees or plants are suitable for urban forestry. It contains information on species distribution, characteristics, site requirements, uses and propagation techniques.

1. Araucaria

Common name: Araucaria

Scientific name: *Araucaria heterophylla* or *A. columnaris*

Family: Araucariaceae

Distribution: Generally found in regions with cold climate

Characteristics

A cone-shaped tree with a single trunk from which short, stout branches grow out in whorls, these whorls of branches decrease in size upwards. Leaves are clustered densely, curved, sharp-pointed.

Site requirements

Grows in areas with cold climate and can be planted in the lowlands and mountains.

Uses

As an ornamental, it is a popular garden tree sometimes planted in pots to retard its growth.

Propagation: Seeds

2. Aroma

Common name: Aroma

Scientific name: *Aroma farnesiana*

Family: Mimosaceae

Distribution

Found all over the Philippines in open grasslands, thickets at low and medium altitudes and especially common in regions with long dry seasons.

Characteristics

A shrub or small tree that grows 2-4 m high; it has sharp spines, 0.5-2 cm long and zigzagging lenticellate branches. Leaves are generally in fascicles of three in a node. Flowers are tiny, fragrant, yellow. Fruits are in clusters, slightly compressed to cylindrical.

Site requirements: Grows in various types of soil; not sensitive to long dry spell.

Uses

A source of well-known cassia, a perfume from France; bark and pods are used as dye stuff and for tanning; trunk and branches as fuel. The bark is astringent and its decoction is applied to treat prolapsed rectum. Leaves are used as poultice for ulcers and sores.

Propagation: Seeds

3. Aure

Common name: Aure

Scientific name: *Acacia auriculiformis*

Family: Mimosaceae

Distribution: Widely grown all over the Philippines, from lawns to abandoned areas.

Characteristics

A resilient, vigorously growing, small tree with a generally crooked trunk and with a diameter up to 60 cm. The true leaves are twice pinnate compound seen only at the seedling stage. The small yellow flowers, in short slender clusters are fragrant. Fruits are curled pods which turn brown, then black when ripe.

Site requirements

Grows well in sites with mean annual rainfall of 1,800-2,500 mm; average temperature, 26-30°C; deep or shallow soil; in limestone podzol and lateritic soil; generally has optimum growth in clay soil.

Uses

Fuelwood, wood pulp, shelterbelts, furniture, building poles, fence posts, for N-fixation and soil improvement.

Propagation: Seeds

4. Bo tree

Common name: Bo tree

Scientific name: *Ficus religiosa* L.

Family: Moraceae

Distribution: Widely grown along the wayside all over the country

Characteristics

A large tree, easily recognized by its stalked, heart-shaped simple leaves; young leaves are pinkish turning fresh green before becoming darker green when mature.

Site requirements

Grows in second-growth forests and likes partial shade, thrives well at low altitudes; requires no special moisture level.

Uses

Timber, fuelwood, fodder, windbreak, posts and for construction purposes, also as ornamental for landscaping.

Propagation: Seeds, cuttings.

5. Banaba

Common name: Banaba

Scientific name: *Lagerstroemia speciosa* (L.) Pers.

Family: Lythracea

Distribution: Widely grown along the wayside all over the country.

Characteristics

The numerous bushy and sturdy branches are covered with heavy cone-shaped foliage. The bark is smooth, grey to cream in color, peels off in irregular flakes; the leaves which are smooth, oblong to elliptic ovate, 12-25 cm long turn red when they mature. The flowers are roselike, scentless and richly colored.

Site requirements

Clay loam soils; average rainfall of 2,000 mm and average temperature of 28°C.

Uses

Usually planted along the shoulders of streets and avenues for shade and for its attractive flowers. Bark, leaves and flowers are used as purgative and as tea for diabetics. The stems contain saponin and tannin.

Propagation: Stem layering, marcotting

6. Bottle brush

Common name: Bottle brush

Scientific name: *Callistemon citrinus*

Family: Myrtaceae

Distribution: Commonly found in gardens, parks and along narrow roads.

Characteristics

A medium-sized tree having cascading branches with whorls of simple, narrow leaves which give a fragrant, oily aroma when crushed; flowers are small and bright red, crowned along the end portion of the branches; fruits are small and brown, looking like pepper corns.

Site requirements: Clay to clay loam soil with average soil moisture.

Uses: Very suitable for landscaping

Propagation: Seeds

7. Dapdap

Common name: Dapdap

Scientific name: *Erythrina orientalis*

Family: Fabaceae

Distribution

It is native to the Philippines, seen along highways and in selected parks; widely found along seashores.

Characteristics

A tree that reaches a height of 15 m; has stout branches and branchlets; trunk and branches are armed with short, dark brown, black-tipped thorns. Flowers are bright red, large and numerous.

Site requirements

Occurs at low to medium altitudes; grows on coarse- to fine-textured soil; preferably well-drained. Can grow with as little as 200 mm/yr but does best with 1,500-2,500 mm/yr. thrives in tropical/subtropical areas.

Uses

A shade tree, planted as live fences; serves as windbreak. The bark is used to treat boils, fever, coughs and dysentery.

Propagation: Seeds, cuttings

8. Golden shower

Common name: Golden shower

Scientific name: *Cassia fistula*

Family: Caesalpiniaceae

Distribution: Found from northern Luzon to Mindanao and also in Palawan.

Characteristics

A medium-sized, erect and deciduous tree that reaches a height of 6 m or more. Flowers are bright yellow and fragrant. They usually come during summer. Fruits are long, cylindrical and woody.

Site requirements

Thrives well in clay loam/sandy loam soil with an average rainfall of 2,000 mm and temperature of 28°C.

Uses

As ornamental, fodder; for fuelwood, windbreak, posts and medicinal purposes; a shade tree.

Propagation: Wildlings, seeds.

9. Ilang-ilang

Common name: Ilang-ilang

Scientific name: *Cananga odorata*

Family: Annonaceae

Distribution

Grows anywhere in the Philippines, in plantations and natural forests. Usually planted in greenbelts and along roadsides.

Characteristics

A medium-sized tree attaining a height of 30-35 m with a diameter up to 80 cm. Flowers which are greenish-yellowish and in small clusters are very fragrant.

Site requirements

Prefers sandy to loam soil, fertile, well-drained with high organic matter content. Thrives best in lowland areas with an elevation of not more than 900 m; performs well with an average annual rainfall of 4830 mm.

Uses

Source of oil perfume, its flowers are made into leis and garlands. The bast fibers can be made into coarse rope.

Propagation: Seeds, cuttings.

10. Agoho

Common name: Agoho

Scientific name: *Casuarina equisetifolia*

Family: Casuarinaceae

Distribution

Widely found in Central Luzon and Ilocos provinces; planted usually along roadsides and in parks.

Characteristics

A short-live, evergreen tree, 15-50 m high and 20-100 cm in diameter. It has very straight trunks and narrow, pointed feathery crowns. The wood is dark

Site requirements

Does well on sandy, calcareous soils, prefers alkaline to neutral pH, but grows in acid soils; grows in elevations as high as 1,500 m under rainfall of 200-5,000 mm and temperature, 10-35C.

Uses

Quite effective for windbreak; often planted as an ornamental and hedge; used to stabilize sand dunes and to block winds; also for erosion control.

Propagation: Seeds, wildlings

11. Talisai

Common name: Talisai

Scientific name: *Terminalia catappa*

Family: Combretaceae

Distribution: Found along beaches and in parks

Characteristics

A medium-sized tree growing up to 25 m high. Leaves are long, spirally arranged. Flowers are small and greenish white with foul smell.

Site requirements

Thrives in areas with sandy to sandy loam soil and an average rainfall of 2,000 mm and temperature of 28°C.

Uses: Shade or ornamental tree; suitable for dune stabilization and erosion control

Propagation: Seeds

12. Indian tree

Common name: Indian tree

Scientific name: *Polyalthea longifolia*

Family: Annonacea

Distribution

Widely planted in parks, islands, backyards, home gardens, along roadsides and thoroughfares

Characteristics: A columnar-shaped tree which reaches a height of 10 m.

Site requirements

Thrives in clay loam to loam soil with an average rainfall and temperature of 2,000 mm and 28C, respectively

Uses: For landscaping purposes

Propagation: Seeds

13. Red gum

Common name: Red gum

Scientific name: *Eucalyptus camaldulensis*

Family: Myrtaceae

Distribution

Widely grown in Central Luzon; usually planted in greenbelts, backyards and along roadsides.

Characteristics

A fast-growing tree that reaches a height of 50m; trunk is rather crooked and the crown tends to be thin. The bark of older trees is rose pink, smooth and patchy

Site requirements

Prefers moist alluvial valleys and riverbanks but can withstand shallow, droughty soil. It thrives with 400-1,000 mm/yr rainfall and 11-35C temperature. It is found in elevation 30-1,525 m.

Uses

Lumber, posts, fuelwood, windbreak, shelterbelts, good for charcoal and pulpwood. The bark is a source of tannin.

Propagation: Seeds

14. Fire ball

Common name: Fire ball

Scientific name: *Calliandra haematocephala*

Family: Mimosaceae

Distribution: Grown throughout the Philippines.

Characteristics

An erect shrub, 4 m high; leaflets, 6-10 pairs; pods, 6-10, 0.8-1.25 cm, brown, seeds, 6 or fewer.

Site requirements

Can thrive in areas 100 m asl and below. Prefers clay loam soil with an average rainfall of 2,000 mm and temperature of 28°C.

Uses: For ornamental and landscaping purposes.

Propagation: Cuttings

15. Alibangbang

Common name: Alibangbang

Scientific name: *Piliostigma malabaricum*

Family: Caesalpinoideae

Distribution:

Mostly abundant in dry slopes. Thrives well within the open lands of Carrangalan and Pantabangan watershed areas; planted along roadsides.

Characteristics:

A small tree 8-10 m high, with a diameter of 20-40 cm. Leaves are pale green, heart-shaped at the base but notched at the apex. Flowers are white; the bark is yellowish brown and checked.

Site requirements

Common to dry open places, foothills and second-growth forests, particularly where forests are invading grasslands. Grows well up to at least 700 m; highly resistant to drought.

Uses

Wood is good for interior work, firewood, charcoal and slipper heels. Leaves are used for flavoring meats and fish. The bark is reportedly used to treat fever and dysentery.

Propagation: Seeds

16. Cassia

Common name: Cassia

Scientific name: *Cassia biflora*

Family: Caesalpiniaceae

Distribution: Cultivated along avenues, in parks and private gardens.

Characteristics

A bushy plant, the cassia is a favorite flowering shrub planted between wayside trees. It has simple pinnate leaves and clustered, yellow flowers. Fruits are typically flattened pods.

Site requirements

Light, deep, well-drained, rich soils. It naturally occurs in areas with a mean annual temperature of 20-28C. It is most common in areas where annual rainfall is 650 mm or more. It is a lowland species (below 800 m).

Uses: An excellent flowering shrub

Propagation: Seeds

17. Fire tree

Common name: Fire tree

Scientific name: *Delonix regia*

Family: Caesalpiniaceae

Distribution: Found throughout the Philippines

Characteristics

A fast-growing tree with spreading branches reaching 20 m or more. Smooth bark is light gray. Pinnately compound leaves are finely divided, 30-40 cm long. Flowers are long-stalked, with brilliant colors; fruits are hanging, flat and woody; they turn yellow and black when ripe.

Site requirements: Loamy soil

Uses

For N-fixation, shades shelter, ornamental, fuelwood, forage and windbreak. The seeds/pods are edible

Propagation: Seeds

18. Kamachile

Common name: Kamachile

Scientific name: *Pithecellobium dulce* Roxb. Benth.

Family: Mimosaceae

Distribution: Found all over the Philippines especially in warmer drier regions.

Characteristics

A tree about 5-18 m high. Ultimate branches are often pendulous, with short, sharp, stipular spines. It has a broad crown and a short bole; leaves every e pinnate, 4-8 cm long; at the base of each leaf is normally found a pair of short sharp spines. Flowers are white in dense heads about 1 cm in diameter.

Site requirements

Endures drought and withstands heavy cutting; survives both heat and shade and can grow on poor soils and denude lands in dry climate and on seacoast even with its roots in brackish or salt water.

Uses

For general construction purposes, fuelwood, posts, pulp is eaten raw and made into beverage similar to lemonade. Oil extracted from seeds after refining and bleaching can be used for food or in making soap; source of tannin. Also for bee forage, fodder, hedges, shelterbelts and shade.

Propagation: Seeds and cuttings.

19. Fringon morado

Common name: Fringon morado

Scientific name: *Bauhinia purpurea* L.

Family: Caesalpiniaceae

Distribution

Widely found in gardens or parks. Usually planted in islands, greenbelts and along roadsides.

Characteristics

A shrub or small tree which is sparsely branched. Leaves are alternate, broad elliptic or oval, 9 cm long, one-third to one-half parted from apex; lobes are rounded with 9 prominent radiating veins beneath shallowly cordate; petioles, 3-4 cm long.

Site requirements

Clay loam to sandy loam soils; average rainfall of 2,000 mm and temperature of 28°C.

Uses

It is planted as an ornamental in gardens or parks because of its attractive flowers and leaves

Propagation: Seeds

20. Mangium

Common name: Mangium

Scientific name: *Acacia mangium* Willd.

Family: Mimosaceae

Distribution: Found all over the country especially in denuded sites.

Characteristics

A medium-sized broad-leafed legume, 10-30 m high. Boles are straight and slightly fluted at the base. Flowers are small, white or cream. Seeds are arranged longitudinally within the pod.

Site requirements

Grows well on eroded, rocky, mineral or alluvial soils, prefers acidic soils. Thrives in areas with annual temperature, 12-34°C and annual rainfall 1,000-4,500 mm.

Uses

An all-purpose hardwood; for shaded, ornamental purposes, boundaries, windbreak, pulp and paper, particle board, fodder, hedges, shelterbelts, boxes, medicinal, N-fixation, firebreaks and for erosion control.

Propagation: Seeds

21. Santol

Common name: Santol

Scientific name: *Sandoricum koetjape*

Family: Meliaceae

Distribution: Found throughout the Philippines

Characteristics

A tree that grows up to 25 m high and 80 cm in diameter high with smooth and pinkish bark. Leaves are trifoliate and arranged alternately. The fragrant flowers are numerous, greenish yellow about 1 cm long. Fruit is rounded, yellowish when ripe.

Site requirements

Grows best in sandy clay silt loams that are loose, well-drained and contain plenty of organic 800 m asl. It grows in dry and humid climates but does best in areas with an even distribution of rainfall.

Uses

A favorite backyard fruit tree of the lowlands. A decoction from leaves can be used to bathe a feverish person. Ripe fruits are eaten raw or made into jelly and candies.

Propagation: Seeds, grafted seedlings.

22. Mahogany

Common name: Mahogany

Scientific name: *Swietenia macrophylla* King

Family: Meliaceae

Distribution

A native to Peru and Brazil and in Central America, it was introduced in the Philippines in 1914. Grows in Mt. Makiling, Laguna; Benguet; Mountain Province, also in Ilocos, Isabela, Abra, Samar, Marinduque, and Zamboanga. Usually planted along roadsides and in parks.

Characteristics

A large tree with a height 30-40 m. A deciduous tree that sheds its leaves during summer. Leaves are pinnate, smooth and shiny. Flowers are in panicles. Fruits are in large and conical, light chestnut brown pods, 1-2 cm in diameter, 2-6 cm long which split open when ripe.

Site requirements

Prefers well-drained, sandy, clay slopes. Does well on rather shallow as well as deep, alluvial soils. Thrives in areas having temperature, 11-32°C and rainfall 1,500-5,000 mm.

Uses

Medicinal lumber, firewood, carvings, boat/ship building, veneer and panelling, cabinet making, also as shade for coffee and cacao.

Propagation: Seeds, potted seedlings.

23. Duhat

Common name: Duhat

Scientific name: *Syzygium cumini* (Linn.) Skeels

Family: Myrtaceae

Distribution

Introduced in the Philippines from the Malaysian region. It has become well distributed throughout the country where it is both cultivated and found in great number in the wild.

Characteristics

A medium-sized evergreen tree, 10-30 m high. It has spreading branches. Leaves are opposite, smooth and leathery. Flowers are small, scented, pink, light yellow or nearly white. Fruits are in cluster. The fruit turns dark purple to almost black when ripe; its flesh is grayish white and juicy with a mild acid taste. It contains a single large seed.

Site requirements

Thrives on various soil types, but especially on rocky calcareous soils. Grows best on deep, fertile, well-drained soils, from clay to sandy loams and limestone. Best adapted to the lowlands (less than 600 m) but may occur as high as 1,800 m. Strictly a tropical species, prefers a distinct dry season but can grow in regions with heavy rainfall (1,500-10,000 mm), riverbanks and tolerates flooding.

Uses

Planted as an ornamental, road tree and shelterbelt tree. Wood is used for fuel, posts, exterior joinery, carpentry, agricultural implements, bridge/boat building and for making musical instruments, particularly guitars. Leaves are used as medicine; bark, for dyeing and tanning.

Propagation: Seeds

24. Neem

Common name: Neem

Scientific name: *Azadirachta indica* A. Juss.

Family: Meliaceae

Distribution

Endemic to India, it is a newly-introduced crop/tree in the Philippines. Because of its beneficial properties, it is now propagated throughout the country. Usually planted along roadside and thoroughfares.

Characteristics

A medium-sized tree, 15 m high and 80 cm in diameter. It has low branches and an ovoid crown. Leaves are large, drooping, pinnately compound. Flowers are abundant, small, white and fragrant. The bark is grey with scaly plates and the thick inner bark is pink, astringent and bitter tasting.

Site requirements

Thrives in infertile, shallow, rocky or clay soils; survives temperatures, 44°C to below 0°C, grows at elevation from sea level to 1,500 m, needs annual rainfall of 450-1,150 mm for good growth.

Uses

As windbreak, a shade tree for cattle, for soil improvement; used in insecticidal, medicinal preparations. The wood is used for fuel, construction, furniture making, paper pulp, chipboard. Leaves are good mulch and can be used as insecticide. Oil extract is used in soaps, cosmetics, dyes, lubricants, and as an illuminant.

Propagation: Seeds

25. Mango

Common name: Mango

Scientific name: *Mangifer indica* L.

Family: Anacardiaceae

Distribution

Central and southern Luzon, central and western Visayas; and the Ilocos provinces are the main production areas in the Philippines.

Characteristics

A large, widely and densely crowded evergreen reaching a height of 33 m and a diameter of 2 m. Leaves are oblong to oblong lanceolate. Flowers are 3-4 mm with

long, pink, red, orange, green or yellow petals. The bark exudes a milky latex when injured.

Site requirements

Thrives in deep, rich soil high in organic matter. Annual rainfall of 800 mm is sufficient if it is well distributed; the ideal temperature, 24-27°C. Most commercial production is below 610 m but mango is known to grow up to 1,220 m.

Uses

Shade tree. Fruit is edible. Wood is good timber and is used for heavy furniture, doors, window casings, floors, plywood, turnery and boxes. Young leaves and shoots are eaten as vegetable and used to treat chicken pox.

Propagation: Seeds, grafting, tree breedings

26. Lokinai

Common name: Lokinai

Scientific name: *Dacrydium elatum* Roxb.

Family: Podocarpaceae

Distribution

Infrequently collected in the Philippines, though common and forming pure stands elsewhere. In Luzon, it is found in Quezon, in the Sierra Madre mountains and Mindoro. Also grown in eastern Mindanao.

Characteristics

Small to large tree up to 40 m high. Brown bark fissured with loose scaly flakes, juvenile leaves are slender with needles up to 20 mm long.

Site requirements

Thrives in poor soils at low to medium elevation at least 1,000-2,000 m asl.

Uses: For landscaping purposes

Propagation: Seeds

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