Fundamentals of Architecture

Book 1 Volume 2

Editors:
William B. Qurix OFR, FNIA, FCIMC, MNIM
Oludolapo O. Amole MNIA
General Editor:
Abubakar Adamu Rasheed MNI, MFR, FNAL, HLR

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Fundamentals of Architecture

Book 1 Volume 2

Landscape architecture, Interior Architecture and Design, Furniture Design

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Oludolapo O. Amole MNIA

Plant Materials, Classification and Uses in Landscape Design

Obiefuna, Jerry N. *Godfrey Okoye University, Enugu*. **Nenchi Deborah. W.** *Bingham University, Karu* **and Atumye Amos A.** *Bingham University, Karu*

Overview

Plants and plant materials along with air, moisture, water, atmosphere, gravity, and life forms are unarguably exceptional gifts of nature that distinguish our spaceship earth from all other stars and planets in the solar system. Land, water, plants/vegetation, air, and sunlight are all interlinked in a complex web driven by the energy of the sun. In this web, geology/soils, climate, and water powered by sunlight determine the type of vegetation/plant materials that act as a carbon sink, delivering freely to humans, animals, and organisms, directly or indirectly, food, fibre, air, energy, and numerous ecological services. As noted in Waterman (2009), an understanding of plants has been fundamental to human survival through time and especially now with the warming global temperatures and climate change. Beyond these, plant materials that constitute the 'softscape' along with the 'hardscape' are the main ingredients of landscape design.

This text discusses the scientific and botanical classification of plants based on their kinship, evolution, and structure into division, class, order, family, genus, species, variety, and form (Chen, 2011; Laurie, 1986). This could sometimes be confusing to a non-plant specialist. The horticulturist however uses botanical (genus) and common names to classify plant materials while also classifying them by form into trees, shrubs, herbaceous and annual plants, groundcovers, and vines. This is considered by Laurie (1986) as a useful breakdown of the plant kingdom for landscape architecture and design. In the real sense, it is these diverse plant materials that are the "building blocks" valued for their architectural usefulness for all soft landscape aspects of a landscape design. In nurturing a working knowledge of plant materials and their use in landscape design, this essay is geared toward providing a simple classification of plant materials in addition to highlighting their design attributes with the criteria for their selection.

Objectives:

the objectives of this chapter are to:

1. identify and explain the classification of plant material by genus, species, and common name as appears on the landscape planting plan;
2. explain their classification by appearance, form, habit with examples with some Nigerian plants;
3. identify and describe the design attributes of plant materials; and
4. identify and explain the criteria for plant selection in landscape design.

Plant Classification

Botanists classify plants according to their evolutionary order within the plant kingdom. There are several groupings depending on which professional is concerned. Figure 1 below shows the evolutionary order and the relationship between the different groupings. Four (4) of the groupings are of interest to landscape architects/designers in deriving plant materials for landscape design. These are mosses, ferns, conifers/ cycads and flowering plants. Mosses and ferns are non-seed producing plants, while conifers (such as pines, hemlocks, firs, and spruces) and cycads have "naked seeds" produced on male and female cones or strobili and classified as gymnosperms. The last of this grouping are the flowering plants or angiosperms comprising trees, shrubs, herbaceous plants, ground covers, vines, etc.

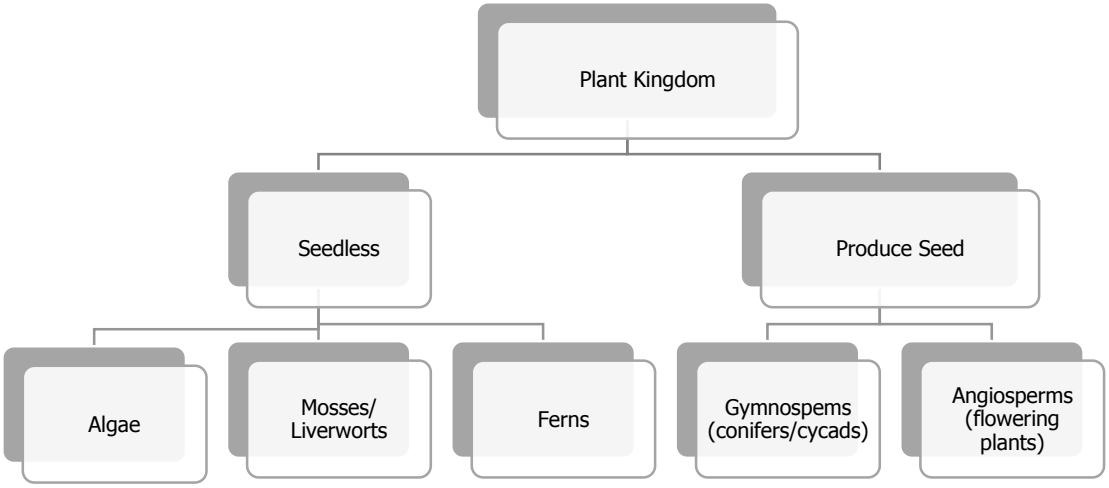


Figure 1: *Plant Kingdom Classification by Evolutionary order* (*Source*: Adapted from Streich & Todd, 2014).

Classification of plant materials by Genus, Species, and common names

A simple classification system commonly used in planting schedules that accompany landscape planting plans is explained below for its straightforwardness. In this classification, each plant is identified by its botanical name, which is in Latin and universal, along with a common name used in an area in the region. The botanical name comprises genus and species (Figure 2), a couple of examples of which can be thus: *Delonix regia* (common name: Flamboyant tree or Flame of the Forest) and *Ixora chinensis* (common name Ixora). In some instances, the species name can help reveal the country of origin as with *Ixora chinensis* which is native to China.

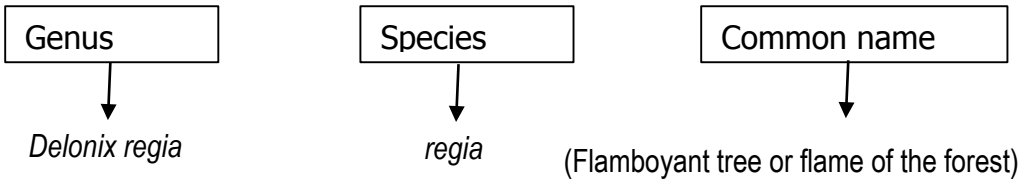


Figure 2: *An example of classification by botanical and common names.*

The naming of a plant gets longer when a third name is added to name a cultivar or a variety (Table 1). A cultivar is a plant that has been carefully propagated for some unique traits such as colour, fruit size, and shape. This type of plant does not produce true-seed, meaning that if the seeds are planted, they may fail to produce a replica of the plant's true form. To name a cultivar, the name is added to that of the genus and species as the third name starting with a capital letter and is set out in single quotation marks. For instance, in these shrubs *Acalypha wilkesiana 'Moorea'* (acalypha) and *Codiaeum variegatam 'Rubrum'* (croton), *'Moorea'* signifies the cultivar of Acalypha while *'Rubrum'* or red colour is the type of Croton plant. However, if true form seedlings are to be produced, these plants are best reproduced from stem cuttings, bulb division, or tissue culture.

A variety is a plant with unique characteristics that can produce true-to-seed, meaning the seeds can be planted to reproduce the traits of the mother plant as illustrated by this ground cover example named *Vinca rosea var. alba* (white Vinca).

Hybrids are different from cultivars and varieties as they are reproduced by the process of cross-pollination of two similar plant species to produce seeds. The seeds are then planted to produce a new plant with different features from the initial parents. An example is *Hibiscus rosa-chinensis* which has many hybrids producing different types of flowers. Another example is *Hibiscus rosa-sinensis* or *'Butterfly'* which has golden yellow blooms, while *Hibiscus rosa- sinensis 'Brilliant'* has red flower blooms.

Cultivars, varieties, and hybrids offer the landscape designer a unique range of plants with specific features. When using them on a planting design, they should also be properly named to distinguish them from their close relatives.

Table 1.

Typical plant schedule showing botanical and common names and some cultivars.

S/N	Botanical	Common Name	Plant Code	Spacing or	No of plants	Remark

	Name			Interval Between	Required	
A	TREES					
	Callistemon viminalis	Weeping bottle brush	CV	5.0m	5	
	Acacia auriculiformis	Acacia	AA	6.0m	3	
	Treminalia mentalis	Step tree	TM	7.0m	2	
	Kigelia Africana	Sausage tree	KF	As on plan	4	
	Plumeria rubra	Frangipani	PR	5.0m	3	
B	PALMS					
	Bismarchia nobilis 'silver'	Bismarchia palm	BN	As on plan	1	
	Cocus nucifera	Coconut	CN	As on plan	1	
	Elaesis guineensis	Oil palm tree	EG	7.0m	38	
	Arcrohtophoenix alexandrae	Kings palm	AA	7.0m	50	
C	SHRUBS / VINES					
	Bougainvillea spectabilis 'Elizabeth Angus'	Bougainvillea	BS	0.5m	25	
	Quisqualis indica	Quisqualis	QI	1.0m	15	
	Ixora javanica	Ixora	IJ	0.5m	55	
	Codiaeum variegatum	Codiaeum	CV	0.5m	68	
	Duranta variegate	Variegated yellow bush	DV	0.3m	428	Hedge

	Euphordia milii	Crown of thorns	EM	0.3m	220	
D	GROUND COVERS					
	Gomphrena globose	Globe amaranth	GM	100m	650	
	Tradescantia spathacea 'Dwarf'	Dwarf tradescantia	TP	200m	450	
	Alternanthera paranychiodes	Alternanthera	AP	200m	376	
	Axonopus compressus	Port Harcourt grass	AC	100m	250sq.m	Use sprigs
	Zoysia matrella	Carpet grass	ZM	sod	243sq.m	Use sods
	Stenotaphrum secundatum	St Augustine grass	SS	100m	179sq.m	Use sprigs

(*Source*: Authors' works).

Importance of the use of botanical names in planting design and specification

It should be noted that the main identity for each plant in the table above is the botanical name which is in Latin as a universal standard that is used in planting design and subsequently used in the preparation of a planting schedule. The use of botanical names allows for the sourcing of the right plant material from the plant nursery. Planting design specifications require that the true plant stock be provided for a job ensuring that only the intended plant in the design is ultimately supplied by the contractor during implementation.

This is alluded to by Streich and Todd., (2014). Plant classification enables professionals like landscape managers, and gardeners to communicate with ease between themselves and construction practitioners across the world. In this way, decisions on propagation, control, and management of landscape plants are made easier, avoiding the distortion that common names bring with them.

Common names are only peculiar to a locality and therefore are limiting even though they are included in a planting schedule. They can however become confusing when 2 or more plants share the same common name. A good example is *Spathodea campanulata* and

Delonix regia which share the same common name as "Flame of the Forest". Sometimes a common name cannot be used to identify the plant being requested for in the plant nursery because the common name may be alien to the plant dealer. Since botanical names are never repeated, this is best to set them apart.

Other useful plant classification for landscape design

Apart from the botanical classification of plants, there are many other useful classifications of plants that are of architectural relevance and therefore used by landscape architects in deciding plants to use. They include the following:

1. Classification by appearance, form, and habit such as trees, shrubs, ground covers, vines/climbers, palms, aquatic plants, desert plants etc.
2. Classification by plant size such as: tall, medium, small and dwarf.
3. Classification using leaf drop such as deciduous, e.g. *Cassia fistula* (Golden shower), or evergreen e.g. *Khaya ivorensis* (Mahogany).
4. Classification as broad-leaf, e.g. *Teminalia catappa* (Indian almond), or coniferous, e.g. *Pinus caribala* (Pine).
5. Classification as herbaceous plants, e.g Annuals such as *Tegetes erecta* (African Marigold); Biennials like *Zingiber officinale* (Ginger), Perennials like *Canna x generalis* (Canna Lily).
6. Classification based on wind tolerance: low, medium, high.
7. Classification based on Life span such as short > 20 years, medium 20 - 100 years, and long,100years and above.
8. Classification based on country of origin: native (indigenous), or exotic.
9. Classification based on the foliage of the plant: fine, medium, or coarse.
10. Classification based on the preferred soil type: swamp, clay, sandy.
11. Classification based on the flower type, fragrance, colour, etc.
12. Classification based on its landscape use: shade, screen, specimen/ accent.
13. Classification based on the preferred aspect: sunny, shade, or semi-shade.

Types of plant materials

Nature is so diverse in its provision of different types of plant materials that can be used in landscape design. Nigeria spans six vegetation zones from forests to savannah, each offering a variety of plants. Knowledge of what grows best in each zone is needed to achieve a successful planting design when working in any of the zones. Based on design criteria/ requirements, environmental requirements, and stock availability, the landscape architect or designer can make an informed choice from the vast pool of plant materials as follows: -.

a. Trees are woody perennial plants that usually have a single stem and bare branches some distance above the ground. Exceptions exist for multi-stemmed trees. Trees typically grow beyond 6 meters in height. Examples are *Cassia fistula* and *Jacaranda mimosifolia*. An example of a multi-stemmed tree is *Hyphaene thebaica* (Hyphaena palm).

b. Shrubs are perennial woody plants with many stems arising at a distance from the ground. They are smaller than trees and can reach heights of 3 - 6 meters. Examples are *Codiaeum varieagatum* (croton) *and Ixora chinensis* (ixora).

c. Ground covers are herbaceous low-growing plants; some can however reach a height of 1meter. They grow to cover the ground as the name implies. *Gomphera globose* (Globe amaranth) and grasses such as *Axonopus compressus* (carpet grass) are good examples.

d. Climbers are vines or any plant with weak stem parts that need support. They have the habit of clinging, twining, or clasping on their support. Examples are *Combretum indicum* (Rangoon creeper) and *Bougainvillea spectabilis* (Bougainvillea).

e. Aquatic plants are plants that can grow partially or fully in water. Some float on water. They can be used in ponds and natural pools or for planting swampy areas, e.g. *Nelumbo nucifera* (Water lotus).

f. Mosses are spore bearing, non- vascular plants implying they do not have stem matter and do not bear flowers. They grow on clumps in a wet environment. They are used in Japanese gardens to symbolize aging. They can be useful materials in specialized landscape work. Examples include *Plagiomnium cuspidatum* (Baby tooth moss) and *Thuidium tamariscinum* (Tamarisk moss).

g. Perfume or scent plants are used for their therapeutic effect. Perfume plants give out perfume in strong sunshine, after a rainfall, at night, or when bruised. Examples of perfume plants are *Lantana camara* (Lantana), *Jasmine officinale* (Queen of the night), both shrubs, and *Plumeria rubra* (Plumeria) , a tree. They are best used where there is a change in level or in areas where people slow down, and in wind direction to derive their best benefits.

h. Desert plants are plants that can grow in arid regions. These plants can be used in the semi-arid region of Nigeria where the water supply for plant growth is limited to Agave *altenuata* (Foxtail agave) and Opuntia *valgaris* (Prickly pear) cactus. Where irrigation is available, more plant types can be used in arid regions.

i. Exotic plant materials. There are materials that are not indigenous to a particular area. Many plant materials have been moved from one climatic zone to another and from one country to the other where they have adapted to the new environment and are doing well. Exotic plants are available in Nigeria and can be used in many design works. Indigenous plants are however the best for natural planting. Some examples of exotic plants include *Hydrangea macrophylla* (Hydrangea) and *Culluna valgaris* (Heather), both temperate plants that can grow in parts of the country where the weather is cool and wet.

Design Attributes of Plants for selection in landscape design

Aesthetic attributes

This can be in the form or shape of the plant material. Trees can be pyramidal, round, vase, columnar, broad, layered, irregular, and weeping (Figure 3 and Plate 1a-d below).

Examples include: pyramidal- *Thuja plicata* (Thuja), columnar - *Saraca indica* (Masquerade tree), weeping- *Ficus benjamina* (Weeping ficus), layered – *Terminalia catappa* (Umbrella tree or Fruit' tree, *Terminalia mentalis* (Stepped tree or Pagoda tree), round – *Mangifera indica* (Mango at young age), irregular – *Casuarina equisetifolia* (Whispering pine) and others. Shrubs can be fully covered, bare stemmed, vase, have special large flower blooms, or even large leaves. Examples of shrubs include: - fully covered e.g. *Ixora chinensis* (ixora), bare stemmed - *Adenium obesum* (Desert rose) and Vase-shaped e.g. *Jathropha integerrima* (Jathropha).

Other aesthetic attributes are line or vertical effects which trees can be used to create. Trees for instance have single or multiple stems, clear trunk/stem, or linearity of their trunks at a given height, with the canopy spread going with it. All these qualities serve an important role that a designer should look out for. Colour also is a desirable attribute ranging from cool, to warm colours, abundant in plant materials such as in leaf, stems, flowers, and fruits, providing the designer with a variety to choose from. Seasonal colour variation is equally an important attribute, especially in leaf colour that can be used to express transitions in the landscape. Some plants have variegated leaves, having more than one colour on their leaves, and can be an interesting combination with other plants on a planting scheme. Seasonal colour particularly on leaves in autumn is more pronounced in temperate climates than in the tropics. A good example of a tree that shows colour transition in the tropics is *Terminalia catappa* (Indian almond or Umbrella tree). This characteristic can be explored and carefully used to achieve good results in planting design.

The texture of plant materials is also another aesthetic quality they display. Texture can be from tree barks, and from leaves, comparatively. Lastly, size and scale in terms of human scale in relation to function and space are other aesthetic factors that should be used in determining the selection of plant materials to make such places functional and usable by people. All the above attributes are elaborated on with pictorial examples in Alao (2020).

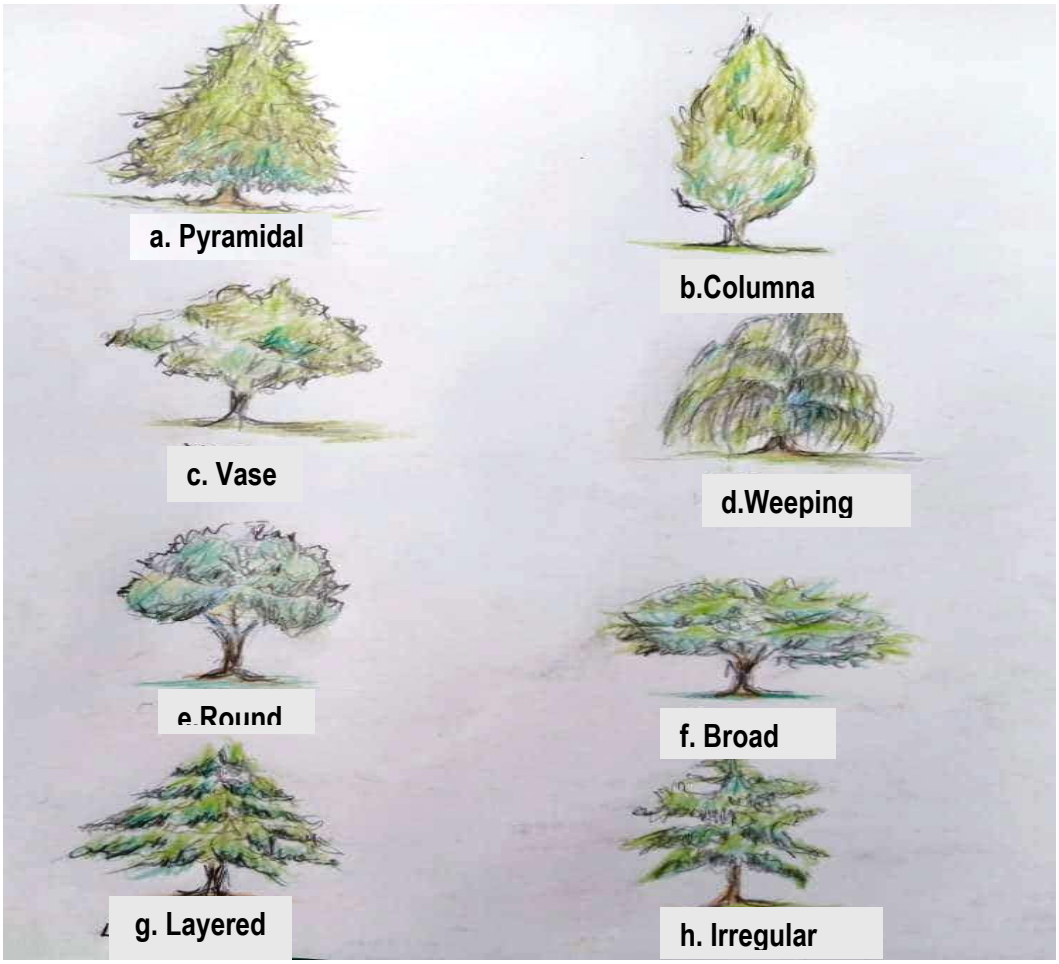


Figure 3: Forms of Trees Landscape Design (Drawn by Alao A. A).

a. Spreading shrub - *Tuneria subulata*

b. Bare stem e.g. *Adenium*

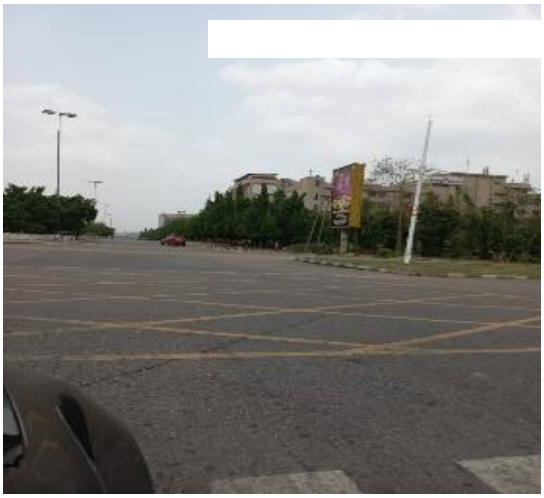
c. Large Flower Blooms e.g. *Nerium oleander*

d. Fully Covered Shrub e.g. *Ixora*

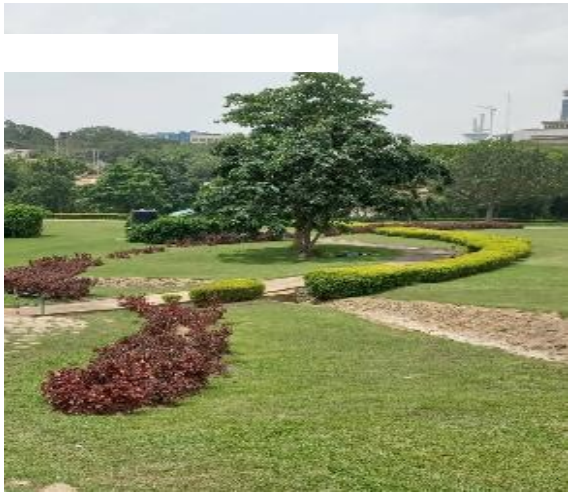
Plate 1: Forms of some shrubs in landscape design (Photographs by Nenchi D. W).

Functional attributes (space-making with plants)

These functional attributes are in the capacity of plants to be used for outdoor enclosure/barriers/edge definition – visual screening, defining lines or movement paths for pedestrian and vehicular traffic, or even for control of movement as with the use of hedges (Plate 2a-h).



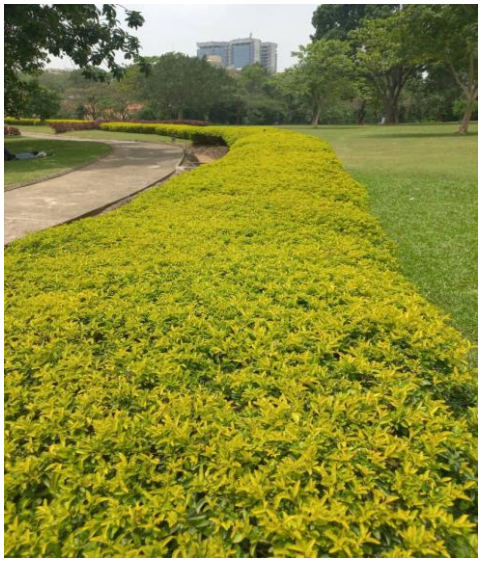
Shelter planting around building. Using trees



b. Breaking up open space using shrubs.

c. Planting to relate trees to building

d. Directing Pedestrian traffic using shrubs. Note the complementary colours of the *Acalypha wilkeseana* and the pavement



e. Contrasting soft scape with hard scape using shrubs and grass.

f. Screening of building using shrubs

g. Screening of building using trees

h. Directing pedestrian and vehicular traffic

Plate 2a-h: Functions of Trees and Shrubs in landscape design (Photographs by Nenchi D. W and Alao A. A).

Another functional attribute of plant materials is their capacity to deflect noise and sound (Rubenstein, 1996); so dense hedges or trees are planted sometimes on highways and motorway embankments to act as sound barriers or deflectors.

Plant material help to moderate the microclimate and can serve this purpose when planted along the east and west of buildings to reduce the thermal load on buildings, or as an overhead plane using vines on pergolas and trellis to provide shade or in the planting of trees that can shade the ground from the effect of the hot tropical sun thus moderating the microclimate. They also help clean the air through utilising polluting carbon dioxide and emitting oxygen during photosynthesis while also filtering out particulate pollutants like smoke, dust, pollen, and fumes (Runebstein, 1996). Plant materials such as trees and shrubs when selected and combined as a windbreak or shelter also perform the role of moderating the microclimate. Plant materials such as trees, shrubs, and ground covers such as grasses are useful in erosion control as their roots hold the soil together just as their leaves intercept the rain, decreasing splashing thereby increasing runoff percolation into the soil.

Plant selection in landscape design

Plant selection in landscape design is therefore based on aesthetic and functional attributes above in addition to growth requirements, the functional requirement of the brief and site along with aesthetic criteria in terms of the mood and ambiance to be created in the composition. The ambiance to be created may be a reflection of the corporate image of the organisation or institution. Added to these of course are maintenance requirements.

Growth requirements have a lot to do with the climate and seasonal characteristics. In Nigeria there are 2 major seasons, the dry and wet seasons which vary in duration across the climatic zones affecting growth rate, spread, habit, and habitat. The characteristics of the plant roots, whether shallow or spreading roots or deep tap roots, will influence how close such plants can be to a building, fence line, parking lot or any structural element within the landscape.

Functional requirements based on the brief and site are considerations on whether the site is urban or rural, the uses it is meant for, such as creating a corporate image for an organisation, or whether it is for recreation or other purposes.

Aesthetic criteria have to do with the mood to be created, which can be influenced by the design style used and the ultimate design scheme created. For example, a formal layout and design with formal planting can exude a corporate image of order and organisation as exemplified in the French formal gardens.

Maintenance requirements vary from plant to plant. The degree of maintenance for the establishment and nurturing of the plants chosen is very important. A planting scheme can be designed to be of low, moderate, or high maintenance on purpose by the types of plant material selected for use. Routine maintenance activities for plants involve watering, raking, pruning, weed control, manure or fertiliser application, treatment for infestations such as termites and others should be worked into the design as part of the maintenance schedule.

How to use plant materials (trees shrubs and groundcovers) in planting design

Plant materials provide the building blocks for the design of a planting scheme. They are the soft landscape components; designed on their own or along with the hard landscape component on a design scheme to express their architectural qualities. Plant materials when properly composed serve as green infrastructure in the landscape carrying out roles that care for the environment in a sustainable way. Considering the attributes for the selection of plants already discussed above, in addition to their green infrastructure qualities, plant materials can be used in the following suggested ways: -

a. To create "out- door rooms' ', or external places, plant materials such as trees, shrubs, and groundcovers can be used. Such materials that can provide horizontal and vertical effects are useful in demarcating boundaries (Plate 2b & d). Examples include *Murraya paniculata* (Orange jasmine), and *Acalpha wilkesiana 'Macrophylla'* (Red acalypha*).*

b. Direction can be provided easily when plants are used. Shrubs planted and maintained as hedges along a pedestrian path can help direct pedestrians (Plate 2d). So also when trees are used by emphasising their verticality and planting them in the direction of vehicular or pedestrian traffic flow on a planting design. Trees with clear stems are excellent for this as avenue planting with palms such as *Roystonea regia* (Royal Palm), and *Elaesis guineensis* (Oil palm).

c. Vertical effect can be achieved using tall trees and to an extent some shrubs also. Plants that have columnar, pyramidal, and conical form or habit can be very useful. Again, Royal palm, Masquerade tree, *Coscus nucifera* (Coconut) , *Terminalia mentalis* (Stepped tree or Pagoda tree) and *Eucalyptus citrodora* (Eucalyptus) are few examples of such trees (Plate 2h and Plate 3a & b). Verticality is used in shelter belts. However, this is usually in a combination of trees and shrubs to make the shelter effective and efficient.

Plate 3a: Trees (Masquerade tree) used for vertical effect around tall buildings (Photograph by Nenchi, D. W.)

Plate 3b: Verticality of stems of *Casuarina equisetifolia* (Whispering pine) used to achieve shade in a park (Source: ESUT Landscape architecture class, 2019).

d. Channeling of views for instance from an object like a building to a desired view, is a useful outdoor experience that plant materials can be used to achieve. Tall trees with straight trunks as in Plate 2h above are good examples of trees that can be used to achieve this.

e. The diverse colour palette and texture of plant materials can be used to contrast or complement other materials such as paving materials, water, or buildings. Using the principle of balance and harmony in a design, creativity is required to achieve this while using trees, shrubs, and ground covers.

f. The texture of the stems and leaves as well as colour of planting materials can be used to contrast with other hardscape materials such as paving (Plate 2e) or finishing of a retaining or free-standing wall.

g. By using plant materials such as shrubs or ground cover at eye level, external spaces can be visually linked. For instance, ground covers planted in a sweeping manner in mass within an open lawn area using *Acalypha wikesiana* (acalypha) and *Duranta rapens* (yellow bush), or *Russelia juncea* and *Lantana sellowiana* will provide scenes of warmth and happiness.

h. When there is change in levels, plants can be used to emphasize or accommodate this by planting them in a mass in such a location, e.g. *Ixora lutea* (Dwarf Ixora).

i. Plants are useful screen materials when used on boundaries, and to create privacy by blocking views. Plant materials with full coverage can be used such as *Thuja ocidentalis* (Thuja), and *Polyalthia longifolia* (Masquerade, or Ashoka).

j. Climbers when assisted to climb by the use of a climbing frame can be used for screening and for splitting up spaces.

k. For creating the impression of an ageing landscape (Plate 4a), such as in a Japanese garden, mosses are useful. Contrasting light and shade using climbers on a pergola, they provide shade, and light effect as the climber casts its shadows while providing light shade

l. Displaying an aesthetic feature of climbers and vines can be achieved by raising climbers on an arbour, arch, or on a pergola to display large flower blooms or leaf texture (Plate 4b).

m. Palms are tropical and sub- tropical trees in the Aceraceae family that grow without branches and have a crown of long evergreen leaves called fronds (some palms can be shrubs). They can be single-stemmed or multi-stemmed. They are a favourite plant material used in landscaping around the world, popular for the tropical effect they bring on a landscape. In Nigeria, they grow very well across the vegetation zones, apart from the indigenous palms,

(b).

Plate 4: (a) Aging of concrete embankment with mosses; (b): A climber, *Quisequalis indica* growing on an arbour (Source: Authors' fieldwork).

exotic ones have been introduced and are doing well in many zones. There are quite a wide variety of palms. Their form, colour, and textures, of fronds, stem distinguish them as a useful and very useful plant material.

n. Some plant materials are poisonous to humans and to animals. A landscape architect must take every precautionary measure before using them. Poison can be in the berries or fruit, stem leaves or roots. Those that produce bright coloured fruits should not be planted where children can be attracted to eat them. Examples of poisonous plants are *Dieffenbacia seguine* (Dumb cane) and *Thevetia peruviana* (Yellow oleander).

Type of Nursery stocks

For reference purposes in plant specification especially with the absence of Nigerian standards for plant nursery stocks, the British Standard (BS) provides a guide to nursery stocks for trees and shrubs under different codes. Most nurseries specify plants based on girth size and heights such as Light Standard (LS) 6-8cm girth, and height of below 2.0 M, Standard (S) 8- 10cm girth and 2.0 -3.0M height, Select Standard (SS) 10 - 12cm girth and 2.5 - 3.5M height, Extra Heavy Standard (EHS), 12 - 14 cm and girth 4.0 - 4.0M, Advanced Heavy Standard (AHS) girth 16 - 14 cm and 4.0 - 4.5M height, Semi Mature girth 18 - 20 cm and 4.0 - 4.5M. Another variant is Standard with clear single trunk up to a minimum of 1.8M, half standard 1.2 - 1.5M, ¾ standard 80 - 90 centimeters, ¼ 1.2 - 1.5M, feathered have a central stem with branching from the ground level, while multi-stemmed have several stems taking off from ground level but are usually pruned down to three in the nursery for stability.

In Nigeria, nursery seedlings are not necessarily based on this or any specific standard even in the established nurseries. This may be attributed to the absence of a standard for plant propagation up until this time. Plants are propagated in small, medium, and

large potting bags. These bags come in polybags or used cement bags Some big nurseries use plastic buckets of various diameters for shrubs and trees. The bigger the size of a container used in propagation, the faster it is to attain a big size. For a high-quality landscape design implementation, it is possible to use the BS standard to guide the selection of plants from the plant nursery. With time and constant demand, plant nurseries in the country may upgrade as a response to the demand.

Summary.

From the foregoing, a good knowledge of plant classification is relevant in the selection of plant materials in a planting design. There are several classifications that landscape architects use to make the task easy to accomplish. Plants have been shown to have architectural relevance when it comes to their aesthetics and functional values. They contribute to the sustainability of the environment by lending themselves to be used as green infrastructure. Nigeria's six vegetation zones, which are an outcome of the climatic conditions, provide an array of unique ecologies and plant species to choose from. Plant materials such as trees, shrubs, ground covers, climbers and vines, aquatic plants, and desert plants including mosses are abundantly available around us. Plant selection is done by carefully combining factors of aesthetic and functional values as well as growth characteristics in creating the outdoor spaces that serve their ideal purposes.

Exercises

1. Discuss 6 plant classifications relevant to planting design.
2. What factors are important when selecting plant materials for planting?
3. With examples describe 3 ways you can use various plant materials in design.
4. Discuss 4 types of plant material that you can use in a design project.
5. Arrange a field trip to a plant nursery nearby to see how plants are under propagation. Prepare an overview of plant varieties that are in stock under: - trees, palms, shrubs, ground cover, grasses, herbaceous plant, vines and climbers. Also record the sizes of potting bags or containers used for each plant type by documenting them in a notebook. Also check if you can identify trees that meet the BS standard i.e. standard, 3/4 standard, ½ standard.1/4 standard, multi-stemmed and feathered.

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BIODATA OF DEBORAH WANYA NENCHI

Deborah Wanya Nenchi is presently an adjunct lecturer at the Bingham University, Karu, Nasarawa State. She served 35 years meritoriously in the Civil Service and attained the position of Directorship cadre. Her passion is to create awareness for the landscape architecture profession and education. goals are to make people develop a passion to learn because knowledge is power and the passport to today and the future.

She has a first degree in Geography from Ahmadu Bello University, Zaria (1982), and a Master's in Philosophy in Landscape Architecture from the University of Edinburgh, United Kingdom (1986). She has previously served as the President of the Society of Landscape Architects of Nigeria (SLAN) and a Fellow of the Society, were she pioneered many landscape architecture innovations in the country, and served as Mentor to many graduates of landscape architecture in exploring career opportunities and setting goals.

Wanya is an adjunct lecturer in the Department of Landscape Architecture at Bingham University, Karu, Nasarawa State, a PhD researcher at the Ahmadu Bello University, Zaria. She has several published works and conference paper presentations and sundry signature landscape projects.

Her hobbies are reading, travelling and a passion for nature.

She is happily married with four children

BIODATA OF DR. JERRY NWABUFO OBIEFUNA

Dr. Jerry Nwabufo Obiefuna, is a lecturer with the Enugu State University of Science and Technology, Enugu. He has a wide range of skills and research interests which include spatial analysis, communication design, remote sensing and Geoinformatics.