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LANDSCAPE MAINTENANCE AND PRACTICES A SUSTAINABLE APPROACH FOR SAFEGUARDING THE FUTURE OF URBAN LANDSCAPES

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ABSTRACT

Sustainable landscape is a landscape designed, installed, and maintained in a residential, commercial, or public setting that is functional, cost efficient, visually pleasing, environmentally friendly and maintainable. It includes an attractive environment that is in balance with the local climate and requires minimal resource inputs, such as fertilizer, pesticides and water. As part of the concept called sustainable development it pays close attention to the preservation of limited and costly resources, reducing waste and preventing air, water and soil pollution. This paper aims at discussing maintenances in landscape and landscape design and suitable practices carried out for a sustainable healthy ecosystem.

KEYWORDS: Maintenance, Practices, Landscape Design, Environment, Ecosystem

INTRODUCTION

SUSTAINABLE LANDSCAPE MAINTENANCE

Aspects to be Taken Care While Doing Sustainable Landscape

- **Measures**

Total plant health care, Proper plant selection, Reduced inputs and maintainability, Drought and insect-resistant turf grasses, Use of native, non-invasive plants, Environmentally-friendly mulches, Controlled release fertilizers with reduced amounts of nitrogen and phosphorous, Irrigation products that reduce water consumption etc

- **Questions Often Missed When Conducting Landscape Design Interviews and Needs Assessments**

Who will maintain the landscape? What size mower should be used? What are the spaces in which landscaping could be adopted? How much labor is available for maintenance? What is the supply, equipment, and expense budget?

Considerations for Maintaining the Sustainable Landscapes

Do separate areas that require different maintenance levels

Figure 1: A High Maintenance Lawn Next to a Low Maintenance Shrub Bed, Woods, or Prairie

Figure 2: Mulched Bed Next to Lawns or Other Ground Covers

Figure 3: Ground Cover Area

Table 1: Consideration of Larger Spaces in Concept Plan

Large Spaces that Should be Considered First in a Concept Plan	Spaces and Shapes that are Impacted by the Large Spaces in a Concept Plan
Lakes	Decks
Woods	Patios
Parking lots	Walks
Courtyards	Pools
Lawn and large ground cover areas	Plant Material beds and borders

The consideration of cost effectiveness is impacted by the processes, plants and hard-goods used in the implementation of that landscape. Planting native plants using natural manure and buying locally grown stock to avoid transportation, using on-site composting to reduce green waste hauling and utilizing hand tools instead of powered one are some of the first steps in creating a truly green landscape design. By planting at right locations water can be conserved. For instance, a water intensive plant should be planted at the bottom of the ground slope while less water requiring plants should be planted at the top of the slope. Grouping of water intensive plants together, preferably near low-lying water collection basins or pools in the garden would ensure a substantial reduction in water consumption while gardening. The use of systems such as drip or trickle irrigation system rather than sprinklers minimizes the use of water and fertilizer by allowing water to drip slowly to the roots of plants, either onto the soil surface or directly onto the root zone, through a network of valves, pipes, tubing, and emitters.

Maintenance of Sustainable Landscapes

The following are the jobs necessary for year round maintenance of a landscape

1. Mowing the lawn, 2. Pruning of trees and shrubs, 3. Application of fertilizer to lawn and plantings, 4. Weed control in lawn and plantings, 5. Spraying and/or dusting for insect and disease control, 6. Planting and care of flower beds and borders, 7. Replacement of dead plants, 8. Painting or staining of fences and outdoor furnishings,

9. Repairing of walls and paved surfaces, 10. Cleaning of fountain and pool basins, 11. Irrigation of lawn, 12. Cultivation of soil around trees and shrubs, 13. Replacement of mulches, 14. Removal of lawn thatch, 15. Rolling and reseeding or lawn, 16. Raking of leaves in fall, 17. Winterization of trees and shrubs, 18. Snow removal, 19. Preventive maintenance on equipments.

Sustainable Maintenance with Landscape Design

- Maintain our old heritage of preserving indigenous species, beautify city with proper vegetation.
- Maintaining plant-animal relationship is one of the important aspects of maintaining biodiversity of any place.
- Old trees should be pruned. All the open spaces and roadsides should be lined with evergreen indigenous species like banyan, peepal, umber, mango, neem, jamun, etc.
- No giant trees should be planted under overhead wire lines and along roadside which need to be opened regularly for road repairs, drainage maintenance, etc.
- Giant trees with a good canopy and shade like rain tree, bakul, putranjiva, hiker species should be planted in such places with clear vision across the area.
- Sometimes small birds like warblers or munias prefer delicate herbaceous plants like coleus or ceaselpinnias, acaranthus for making a nest due to easy weaving.
- Species like aristolocia, petrea, tylophora, tinspora serve multiple purposes of herbal medicine, aesthetic value and ecological significance.
- Likewise a number of shrubs and trees like sita ashok, parijat, adulsa, aloe serve multiple purposes besides aesthetic sense.

Figure 4: Tree Varieties – Ashok, Parijat, Adulsa, Aloe

- Wind breaking trees act as first line defence mechanism to combat strong sea conditions and reduce intensity of short laden winds e.g. Scaevola, Pandanus, Palms, Barringtonia, Vitex, Premena, Casurina species.
- Utilize rain water by creating a large pond allowing rainwater to fill it up. Used partly for irrigation in the adjoining areas.
- The corners of building and accessory structures could be lined with clumps forming species like areca, or kentia palm or species of bamboos or lilies or jasmine, etc.
- Pathways and sit-out areas in a garden should always be laid as higher elevated levels so that no water logging takes place thus not affecting the routine use by garden users.

Figure 5: Wind Breaking Trees

- Utilization of vacant place such as space around pump house, car parkings, balcony and service galleries could be utilized for cultivation of daily need plants and vegetables. This practice lead a family gets two vegetables in a week from balcony gardens.
- Species which are useful in cleaning surrounding atmosphere and providing fresh environment and medicinal produce like lemon grass, mint, asparaguis, aloe vera, lemon fruits bryophyllum, kadipatta, etc. are easy to grow in captive conditions in a limited space.

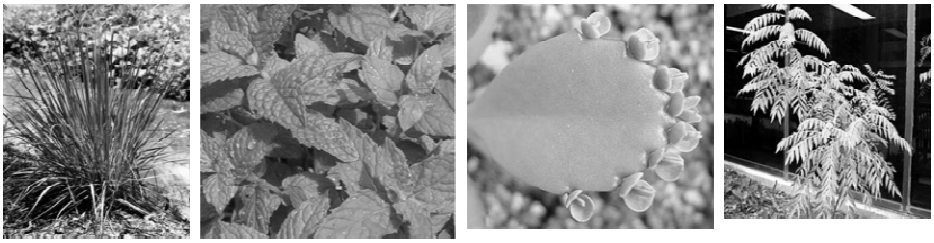

Figure 6: Medicinal Value Species - Lemon Grass, Mint, Bryophyllum, Kadipatta

- Species with open branching pattern and without much crowned canopy should be planted in open areas near creek, forests, etc. as many of them like Bombax ceiba, Phoneix, Reetha, Terminalia, Adina, provide and ideal site for nesting of giant birds like kites, vultures, etc.

Figure 7: Species with Open Branching System – Bombax, Ceiba, Reetha, Terminalia

SUSTAINABLE LANDSCAPE PRACTICES

Site Sustainability

A sustainable landscape is a stable and productive ecosystem that conserves the physical and biological processes occurring on that landscape. Designed and managed sustainable landscapes maintain hydrological function, plant and animal diversity and biomass, soil integrity, and contribute to human.

Goals and Strategies

Soils

- Create or maintain a functioning soil ecosystem.
- Use a soil test to determine existing nutrient levels on site.
- Provide nutrients based on soil test recommendations.
- Use locally-generated compost as needed to improve soil structure and reduce runoff.
- Limit soil compaction using light-impact equipment and being aware of soil moisture.
- Use pesticides only when benefits outweigh environmental risk.

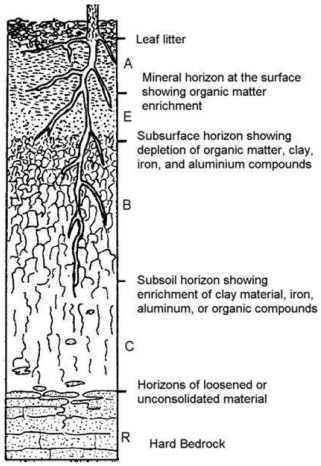

Figure 8: Soil Profile

Hydrology

Utilize strategies to promote infiltration and maintain integrity of the watershed.

- Select plants to fit existing soil moisture conditions.
- Provide irrigation only when required for plant establishment or management during extended drought.
- Use captured and treated rainwater, grey-water, and wastewater when irrigation is necessary.
- Reduce or limit impervious surfaces to improve water infiltration.
- Reduce storm water discharge by installing gardens to slow water movement and encourage infiltration (rain gardens, green roofs) rather than relying on storm water collection and removal from the site.
- Prevent sediment runoff with appropriate construction practices and maximized plant cover.

Vegetation

- Develop plant communities that serve as a foundation for a healthy ecosystem.
- Reduce dependence on resource-intensive features, such as manicured lawns thereby reducing extra inputs of chemicals, energy and time.

- Eliminate the use of and remove vegetation that can harm ecosystems, such as recognized invasive species.
- Select vegetation and site design components that are adapted to the site's geologic and climatic conditions and support native insects and birds.
- Consider replacing alien species with appropriate native species that achieve the same purpose (e.g. aesthetics, function).
- Use Integrated Pest Management (IPM) strategies (i.e. scouting, life-cycle knowledge and decision making based on that information).
- Maintain and increase vegetative coverage to increase biodiversity.
- Preserve as many important (mature, healthy, native) plants as possible.

Materials

- Manage resources and materials efficiently by reducing material needs, reusing materials generated onsite, and recycling materials as much as possible.
- Keep and reuse landscape by-products. For example, collect and shred leaves to use as mulch and compost vegetative debris.
- Select and use renewable, local, and/or low-energy input landscape materials.
- Avoid materials, products, and practices that are harmful to the environment.

Sustainable Landscape Materials

Porous Paving - This material can be used for driveways, walks, or patios. It allows water to pass through to the soil, while providing a solid surface for human and vehicular traffic.

Figure 9: Plastic Lumber

Bricks - Factory seconds and used brick can be crushed and recycled for mulch or for pathways, Rain and irrigation water can pass through the joints, preventing runoff, Long-term maintenance cost is low if the bricks are installed properly.

Concrete Pavers - They are durable, easy to install, have minimal maintenance costs if installed properly, Available in various colours.

Wood - Redwood salvaged from other structures is a sustainable choice. Treated landscape lumber is readily available and, if maintained properly, can last 15-20 years.

Plastic Lumber - They all resist rot and insects and can substitute for preservative-treated wood.

Human Wellness

- Use the landscape to reconnect people to nature.
- Create spaces that are inviting and useful.
- Value the human component of landscapes and social benefits gained by interaction with gardens and natural spaces.

Sustainable Garden Practices

A more-sustainable garden has fewer inputs and fewer outputs than a less-sustainable garden.

- Make compost unceasingly. Making compost should be part of the routine in every garden, even if it is no larger than a window box. Items which cannot be composted domestically (e.g. wood) should be composted municipally.
- Wood material can also be burned.
- Use home-made composts in place of artificial fertilizers and other organic additives.
- Practice rainwater harvesting. Water should be collected from roofs and pavements, stored in gardens and infiltrated into the soil, slowly.
- Use physical and biological pest controls instead of chemicals.
- Return to nineteenth century methods of soil warming, based on the use of compost.
- Use a hand-powered grass-cutter instead of a fossil-fuel mower. This will also save you the cost of an exercise machine.
- Use solar power for garden lighting and garden pumps
- Use lime mortar (not cement mortar) for garden construction, so that hard landscape materials can be re-cycled.

CONCLUSIONS

Landscapes are responsive, re-generative and can contribute to the active and healthy development of the environment and its communities. They create values through significant economic, social and environmental benefits.

This can be achieved by Short term goal - Composting locally grown crops and kitchen waste and returning it back to the garden increases the organic matter in the garden while recycling nutrients within the landscape and Long term goal - Create a more self-sustaining garden

It is in the hands of architects, planners, engineers, horticulturalists, and others work in interdisciplinary teams to create innovative models that outline a path to make the maintenance and practice of landscapes sustainable for the future.

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