International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 13 Issue: 10 | Oct 2026 www.irjet.net p-ISSN: 2395-0072

Designing within the Setback: A Comparative Study of Landscape Design Strategies in Residential Buildings in Chennai, India

Shireen Adeni[1], Dr. Mohammed Waseem Akram[2]

[1]*M. Arch (Landscape Architecture) student, Faculty of Architecture, Dr.M.G.R Educational and Research Institution, Maduravoyal, Chennai, India.*

[2]*Associate Professor, Faculty of Architecture, Dr.M.G.R Educational and Research Institution, Maduravoyal, Chennai, India.*

Abstract-*Residential setbacks are commonly used for parking, circulation, service access, and ornamental planting, although their potential to support environmental performance and residential amenity remains underexplored in site-specific landscape assessment. In Chennai, increasing residential density, limited open space, and climate-related environmental pressures create a need to integrate landscape functions within the available spaces surrounding buildings. This study develops a comparative framework for evaluating residential setback landscape strategies across three residential developments: Ramaniyam Samarpann and Navin's Pearl House in Thiruvanmiyur, and Ramaniyam Tulsi in Adyar, Chennai, India. Three landscape strategies are considered: hardscape-dominated setbacks, ornamental planting setbacks, and multifunctional landscape setbacks incorporating vegetation, permeable surfaces, shading, and appropriate storm water-management measures. The proposed methodology combines site documentation, spatial analysis, vegetation assessment, surface classification, functional evaluation, maintenance assessment, and regulatory review. Quantitative indicators include planted-area percentage, permeable-surface percentage, and canopy coverage, while qualitative indicators address circulation, privacy, and accessibility, drainage, and maintenance requirements. A Setback Landscape Performance Index (SLPI) is proposed to support comparative evaluation across functional, ecological, climatic, water-management, residential-amenity, and maintenance dimensions. The Tamil Nadu Combined Development and Building Rules, 2019, together with applicable amendments and current planning requirements, provide the regulatory context for assessing site-specific constraints. As measured comparative results are not yet available in the manuscript, the study presents a research and assessment framework rather than claiming verified environmental improvements. The framework is intended to support climate-responsive, regulation-conscious, and functionally integrated residential landscape design in Chennai.*

Key Words: Residential setbacks, landscape architecture, residential landscape design, Chennai, green infrastructure, permeable surfaces, storm water management, urban sustainability.

1. INTRODUCTION

A large amount of urban land is made up of residential structures, and the areas around them affect how buildings interact with nearby properties, the streets, and the surrounding environment. Setbacks in the front, side, and back are typically related to building separation, access, light, ventilation, and legal requirements. However, when their design takes into account the site's physical features, these areas can also support flora, rainwater infiltration, shadowed circulation, and other landscape activities [1]–[4].

Setbacks may become primarily paved in crowded urban neighborhoods to provide parking, pedestrian access, and building amenities. Extensive paving can enhance solar heat absorption and decrease infiltration, even if these purposes are essential. Inadequately thought out planting can also cause problems with drainage, access routes, subsurface utilities, foundations, and building upkeep. Therefore, rather than merely adding plants to empty spaces, effective landscape design must coordinate spatial function, environmental performance, and building restrictions [2], [5], [6].



Fig- 1. Existing setback conditions

Because residential plots in Chennai vary in size from small single-family homes to apartment complexes, with different building heights, road conditions, plot dimensions, and open-space availability, the city offers a pertinent context for investigating this relationship. Setback design must accommodate these variances while adhering to relevant construction and planning codes. A regulatory framework for development and building construction is established by

the Tamil Nadu Combined Development and Building Rules, 2019. This framework includes laws pertaining to building setbacks and authorized constructions. Rather than assuming a universal setback dimension, the relevant rules and changes must be examined for each study property.

The setback is treated as a potentially multipurpose landscape zone in this study. Using factors including usable area, planting quality, permeability, shade, storm water management, accessibility, and upkeep, it evaluates various approaches.

1.1 Aim

To develop a performance-based comparative framework for evaluating residential setback landscape design strategies in Chennai, with emphasis on ecological potential, environmental performance, functional integration, and regulatory compliance.

1.2 Objectives

1. To document the spatial configuration, dimensions, surface materials, vegetation, and existing uses of residential setbacks.
2. To classify and compare hardscape-dominated, ornamental planting, and multifunctional landscape strategies.
3. To establish measurable indicators for planted area, canopy coverage, surface permeability, accessibility, and storm water-management potential.
4. To identify potential conflicts between landscape components, building services, circulation requirements, and applicable development regulations.
5. To propose a Setback Landscape Performance Index for systematic comparison of residential setback landscape design alternatives.

2. LITERATURE REVIEW

2.1 Setbacks as residential landscape space

Although setbacks are often defined by building and planning laws, their spatial significance goes beyond the distance between a building and its plot boundary. They can accommodate parking, service access, planting beds, pedestrian walkways, entrances, and transitions between private and public areas, depending on their size and position.

Coordination of these features with the building footprint, movement patterns, seclusion, and maintenance access is necessary for residential landscape planning [1], [2]. While side and rear setbacks might be more appropriate for service access, drainage, screening, or private outdoor usage, a front setback frequently has a greater interaction with the street and entry. Plot size, access needs, and applicable regulations determine the actual function; they are design possibilities rather than general guidelines.

2.2 Residential vegetation and environmental performance

Vegetation can enhance the environmental quality of outdoor areas, support evapotranspiration, and offer shade. Plant shape, canopy density, water availability, nearby building form, and local climate all affect how much of these advantages are realized [3], [4], and [7]. Vegetation can reduce local temperatures, according to research on urban greening, albeit the results vary depending on the size of the green area and the environmental factors examined [3], [7].

When choosing trees, shrubs, climbers, and groundcovers for residential setbacks, consider factors such as mature plant size, root behavior, sunlight, irrigation, drainage, and closeness to buildings. A tight setback could be more appropriate for compact plantings, climbers, or layered shrubs than for a large-canopy tree. On the other hand, a shade tree that improves surrounding paving and outdoor circulation may be accommodated with a suitably wide setback and suitable soil volume.

2.3 Permeability and stormwater management

Infiltration is limited by hard, impermeable surfaces, which can also increase runoff. Rain gardens, cultivated soil areas, permeable pavement, and other source-control strategies can help regulate rainfall near its source [8]–[10]. The qualities of the soil, the depth of the substrate, the amount of rainfall, and the design and upkeep of the drainage system all affect their function.

Setback landscapes in Chennai can provide chances for temporary retention or precipitation infiltration, but these strategies need site-specific evaluation. Before suggesting infiltration-based solutions, it is necessary to take into account the permeability of the soil, groundwater conditions, foundations, current drainage, and local flood risk. Water should not be diverted to nearby homes by landscape design, nor should it damage building foundations.

2.4 Residential landscape design and usability

Planting quantity is not the only factor that affects landscape quality. Accessibility and usefulness are impacted by how pathways, seating, entrances, planting, and service spaces are arranged. When the design divides circulation from planting and service zones while preserving safe access to the building, a setback can serve a number of purposes.

Additionally, the design should take into consideration maintenance access, security, privacy, visibility, and user needs. Extensive asphalt may make moving easier but take

up less space for plants, whereas a dense planting strip may offer screening but impede vision at an entry. Rather than depending solely on one design aspect, these conflicting goals highlight the necessity of comparative evaluation [1], [2], [11].

2.5 Research gap

Research on residential landscape design, sustainable drainage, and urban green infrastructure offers guidelines for environmental performance. However, these concepts must be integrated with plot geometry, legal compliance, functional requirements, and maintenance in a setback-specific evaluation. A comparative approach for analyzing these elements collectively in the residential environment of Chennai is suggested by this study.

3. RESEARCH METHODOLOGY

3.1 Research design

The proposed study uses a comparative case-study methodology that is backed by performance evaluation and landscape documentation. Using uniform standards, it aims to assess current residential setback situations and contrast different landscape approaches.

The research is conducted in three phases:

1. Documentation of existing conditions should include plot geometry, building location, setback measurements, surface materials, vegetation, and present use.
2. Comparative design assessment: compare different landscape approaches to environmental, ecological, and functional standards.
3. Performance evaluation: provide a score to each method based on site observations, recorded measurements, and clear evaluation guidelines.

3.2 Study area: Chennai, India

The geographical scope is Chennai, Tamil Nadu, India. The study includes three residential buildings representing different plot sizes, building types and development patterns.

1. Ramaniyam Samarpann in Thiruvanmiyur

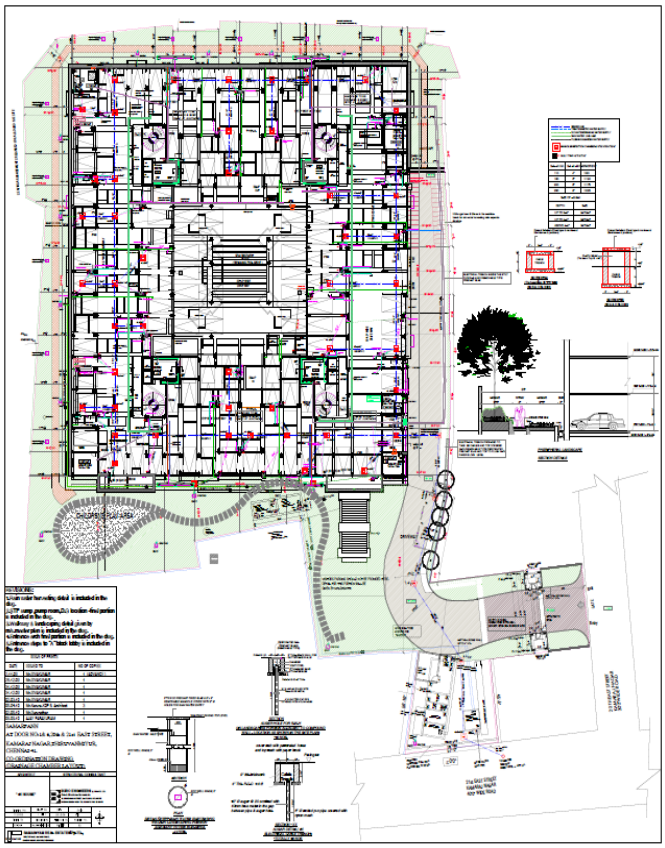


Fig- 2.1. Residential setback plan

2. Navin's Pearl house in Thiruvanmiyur

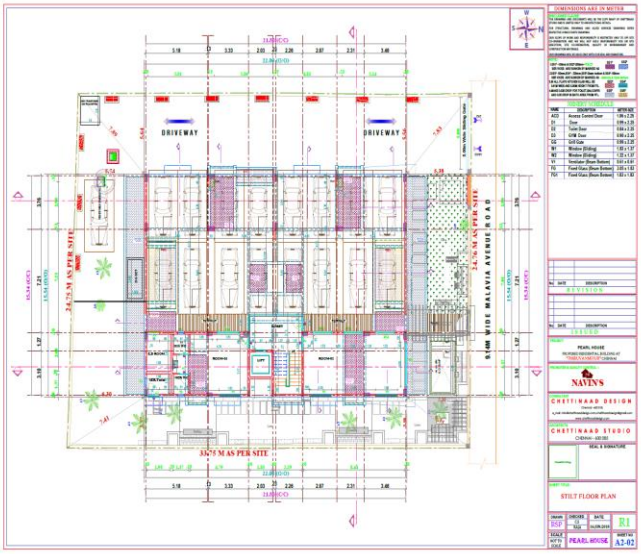


Fig- 2.2. Residential setback plan

3. Ramaniyam Tulsi in Adyar

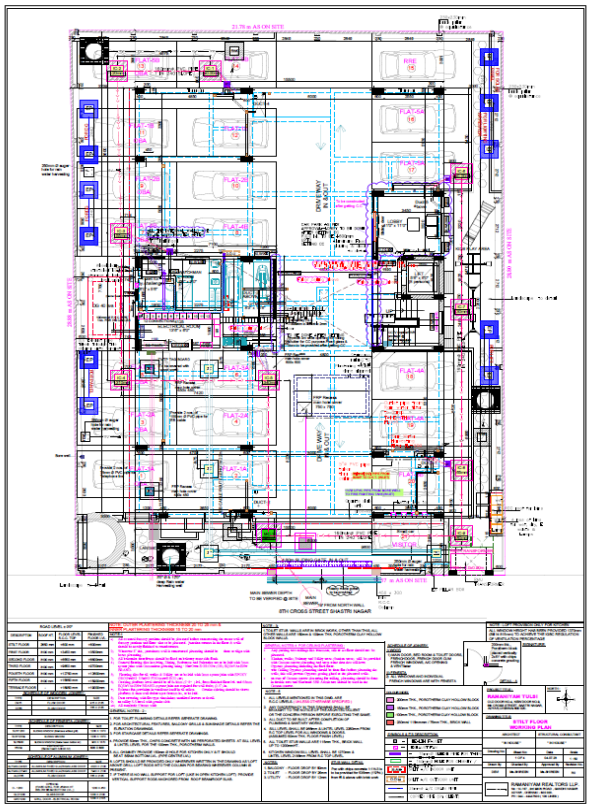


Fig- 2.3. Residential setback plan

3.3 Regulatory assessment

The relevant sections of the Tamil Nadu Combined Development and Building Rules, 2019 and any later revisions are examined in relation to each case study. The authorized building plan, plot boundaries, necessary setbacks, permissible projections, access, parking, and other site-specific limitations are all recorded in the assessment.

3.4 Comparative landscape strategies

Three landscape strategies are proposed for comparison.

Table- 1. Classification of Residential Setback Landscape Design Strategies and Their Main Assessment Criteria

Strategy	Description	Main assessment focus
A. Hardscape-dominated setback	Predominantly paved for access, parking or service functions	Accessibility, hardscape coverage, drainage and heat exposure
B. Ornamental planting setback	Decorative planting beds, lawn or shrubs combined with circulation	Planting quality, visual character, maintenance and usable space
C. Multifunctional landscape setback	Coordinated planting, permeable surfaces, shade and suitable rainwater-management measures	Functional integration, vegetation, permeability, environmental potential and maintenance

3.5 Site documentation

Every residential property is subject to the following data collection:

- Plot area, dimensions and orientation.
- Setback and building footprint widths.
- Setback areas: front, side, and rear.
- Types of surfaces and an estimated covering percentage. Current groundcovers, climbers, trees, and shrubs.
- Routes of entry and pedestrian movement.
- Access to services, utilities, parking, and ramps.
- Rainwater outlets, ponds, and drainage routes. Shade conditions during specific periods.
- Plant health, irrigation, and maintenance frequency.
- Conflicts between landscape features and building functions were noted.

3.6 Performance indicators

Table- 2. Assessment Indicators and Methods for Evaluating Residential Setback Landscape Performance

Category	Indicator	Suggested assessment method
Spatial	Setback area and width	Measured site plan
Functional	Clear circulation and access	Site observation and plan review
Vegetation	Planted area as a percentage of setback	Area calculation
Canopy	Projected canopy coverage	Site survey or mapped canopy
Surface	Permeable surface percentage	Material mapping and area calculation
Water	Runoff, ponding and infiltration characteristics	Site observation and suitable tests
Privacy	Visual screening and overlooking	Viewpoint assessment
Complian	Conformity with	Regulatory review

ce	applicable requirements	

3.7 Data analysis

The proportion of a setback covered by vegetation can be calculated as:

$$P_v = A_v / A_s \times 100$$

where:

- P_v = planted-area percentage;
- A_v = planted area within the setback;
- A_s = total setback area being assessed.

Similarly, permeable-surface coverage can be calculated as:

$$P_p = A_p / A_s \times 100$$

Where A_p is the area classified as permeable under the study's stated surface-classification method.

The analysis should proceed in three stages.

Stage 1: Spatial comparison. Calculate setback area, planted-area percentage, permeable-surface percentage, and canopy coverage for each documented condition.

Stage 2: Functional and environmental assessment. Evaluate circulation, access, privacy, shade, drainage, maintenance, and regulatory constraints using consistent criteria.

Stage 3: Comparative performance assessment. Apply the defined scoring system to eligible existing conditions or alternative design scenarios. Present individual indicators alongside the composite index so that a single score does not conceal important trade-offs.

Where repeated observations or direct environmental measurements are available, the analysis should report the sampling period, instruments, procedures, and relevant uncertainty. Where such data are unavailable, the results should remain descriptive or design-based rather than being presented as verified environmental outcomes.

3.8 Proposed Setback Landscape Performance Index

A composite index can be developed to compare the three design strategies. The index should be calculated only after indicators and scoring criteria have been defined.

$$SLPI = {}_{w_F}F + {}_{w_E}E + {}_{w_C}C + {}_{w_W}W + {}_{w_U}U + {}_{w_M}M$$

Where:

- F = functional and circulation performance;
- E= ecological and vegetation performance;
- C = canopy and shade performance;
- W = stormwater and permeability performance;
- U = usability, privacy and residential amenity;
- M= maintenance efficiency;
- (W F,w E,w C,w W,w U,w M = assigned weights.

The weights should sum to 1. Regulatory compliance should be treated as a mandatory screening condition rather than a benefit that can be offset by a high score in another category. The index should be described as a proposed assessment tool until its scoring method and reliability are tested.

4. RESULTS AND DISCUSSION

1) 4.1 Spatial utilisation of setbacks

Using spatial analysis, setback allocation for utilities, parking, planting, and circulation is assessed to ascertain the effectiveness of the space's organization. Planting spaces are limited by hardscape-dominated setbacks, but access and parking are improved. Multifunctional setbacks successfully combine planting, permeable surfaces, and circulation, while ornamental setbacks improve esthetic appeal. Larger planted spaces, however, may not necessarily be preferable if they impede necessary access or maintenance.



Fig- 3.1. Setbacks of Ramaniyam Samarpann



Fig- 3.2. Setbacks of Navin Pearl house



Fig- 3.3. Setbacks of Ramaniyam Tulsi

4.2 Vegetation and canopy performance

Area, species variety, canopy coverage, plant health, and shade distribution are all taken into consideration when evaluating planting; trees, shrubs, climbers, and groundcovers are all recorded independently. Large trees may interfere with utilities or small spaces, but well-placed trees can offer more shade than huge areas of low decorative planting. Soil volume, sunlight, mature plant size, and building proximity should all be taken into account while designing a planting area.

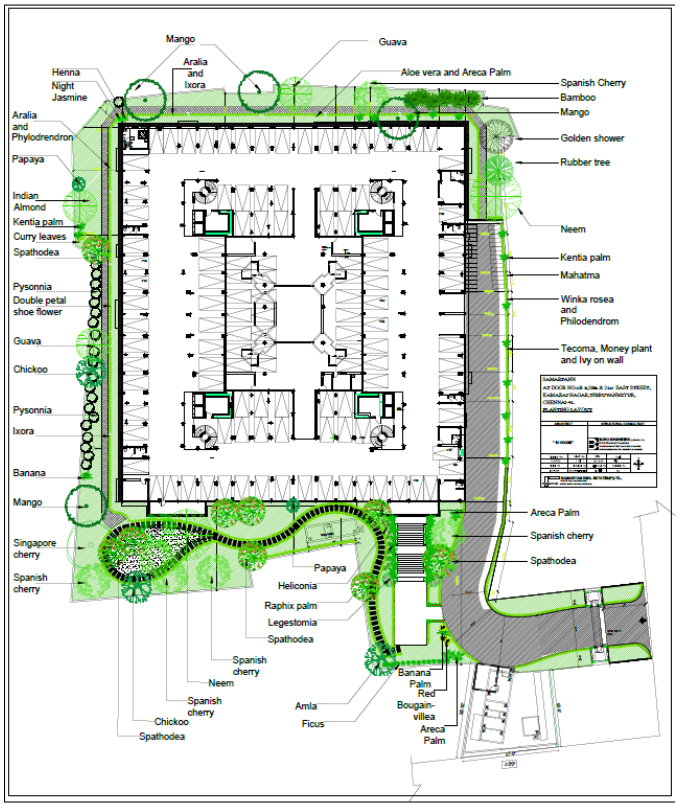


Fig- 4.1. Planting plan of Ramaniyam Samarpann

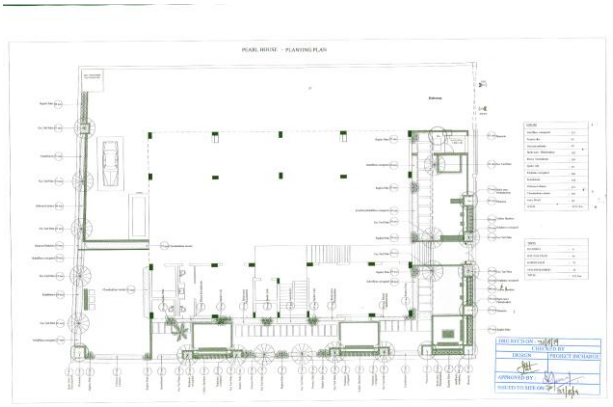


Fig- 4.2. Planting plan of Navin Pearl house

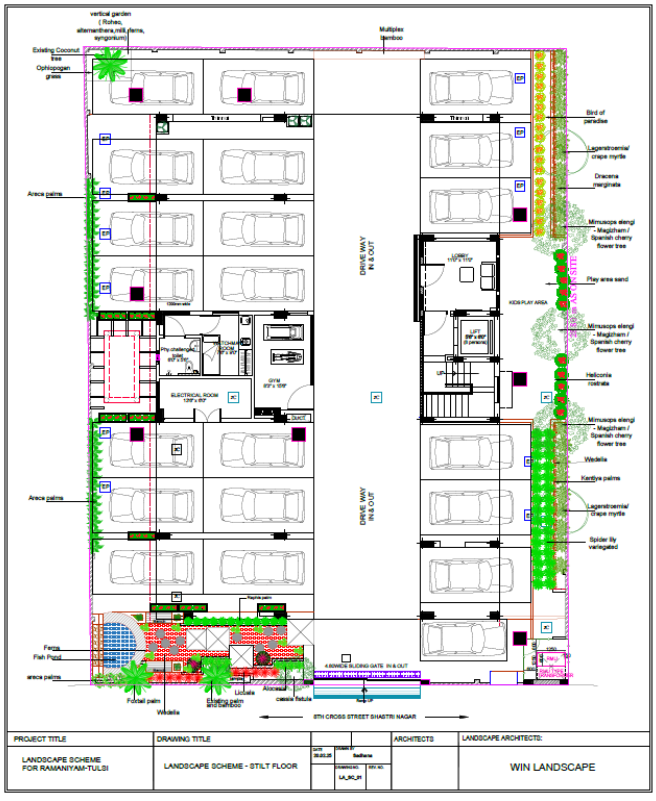


Fig- 4.2. Planting plan of Ramaniyam Tulsi

4.3 Surface permeability and stormwater management

The surface study compares the position of drainage outlets, planted soil, permeable pavement, and paved area. When the majority of the surfaces are impermeable, a hardscape-dominated layout may have a restricted potential for infiltration. When site conditions permit, a multifunctional design may present chances for rainwater management through planted areas, suitable permeable surfaces, or mini rain gardens [8]–[10].

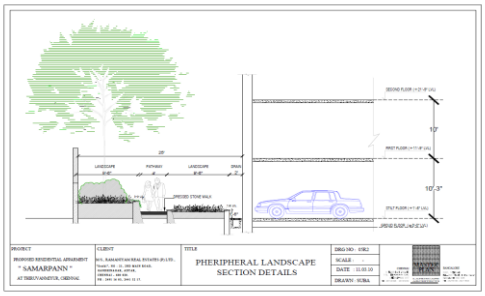


Fig- 5. Landscape section of Ramaniyam Samarpann

Effective drainage is not ensured by permeability, though. Performance can be lowered by inadequate grading, blocked joints, compaction of the soil, and inappropriate subsurface conditions.

4.4 Functional integration and residential amenity

Each strategy's support for pedestrian mobility, entry visibility, privacy, and service access is evaluated in the study. Planting shouldn't restrict utility access, impede vital circulation routes, or interfere with parking and ramps.

When available space permits, the design may incorporate landscaped boundaries between public and private areas, tiny seating areas, or shaded waiting rooms. In compact plots, boundary planting, effective drainage, and unobstructed access may be more important. The real functions that the building requires should be compared to these options.

4.5 Comparative performance matrix

The following is a qualitative assessment of sites documented.

Table 3. Comparative Assessment Framework for Residential Setback Landscape Design Strategies

Criterion	Strategy A: Hardscape-dominated	Strategy B: Ornamental planting	Strategy C: Multifunctional
Access and circulation	Assess	Assess	Assess
Planted-area percentage	Measure	Measure	Measure
Canopy coverage	Measure	Measure	Measure
Permeable-surface percentage	Measure	Measure	Measure
Shade provision	Assess or measure	Assess or measure	Assess or measure
Stormwater management	Assess	Assess	Assess
Privacy and amenity	Assess	Assess	Assess
Maintenance requirement	Record	Record	Record
Regulatory compliance	Verify	Verify	Verify

A defensible conclusion should emerge from these documented comparisons rather than assigning a predetermined winner to a design category.

4.6 Design recommendations for Chennai

The study looks at the following design measures in light of the suggested framework and accepted landscape-planning principles:

1. Front setbacks: Without sacrificing necessary access or other relevant regulations, plan entry access, visibility, pedestrian flow, and planting.
2. Side setbacks: In light of width, lighting, foundations, and utility locations, take into account appropriate planting, drainage, and service access.
3. Rear setbacks: When space and site conditions allow, consider private planting, permeable surfaces, and suitable rainwater management techniques.
4. Tree selection: Match the available area with the mature canopy, root properties, and maintenance requirements.
5. Surface selection: When possible, minimize needless impermeable paving while preserving accessible, safe paths.
6. Water management: After evaluating soil, groundwater, and building safety, takes into account rain gardens or infiltration techniques. Use proper grading and drainage.
7. Maintenance planning: As part of the landscape design, include irrigation, plant replacement, trimming, and drainage cleaning.



Fig- 4. Proposed setback design

These measures should be presented as design recommendations subject to site-specific assessment, not as a substitute for regulatory compliance or engineering review.

4.7 Limitations

The proposed assessment framework has several limitations.

First, the manuscript does not yet provide a complete set of measured comparative data for the three residential developments. Consequently, the relative performance of the cases cannot be established conclusively.

Second, the selected developments may not represent the full range of residential building types, plot dimensions, or development conditions in Chennai. Generalisation beyond the selected cases should therefore be cautious.

Third, the performance of vegetation depends on species, maturity, canopy structure, soil conditions, irrigation, and maintenance. Planting area alone cannot represent all ecological or climatic benefits.

Fourth, surface permeability does not independently establish stormwater performance. Claims concerning infiltration, runoff reduction, or drainage improvement require suitable field tests, verified calculations, or other relevant evidence.

Fifth, environmental outcomes such as temperature reduction and improved thermal conditions cannot be established from design drawings alone. These outcomes require appropriate monitoring or validated analytical methods.

Finally, the SLPI requires a transparent scoring system, justified weights, and testing of its reliability and sensitivity before it can be treated as a validated assessment tool.

The final empirical study should document the number of observations, measurement procedures, site-access limitations, sampling period, and uncertainty associated with the results.

5. CONCLUSION

Residential setbacks should be considered potential multifunctional landscape spaces rather than simply residual areas surrounding buildings. Their design can influence how vegetation, circulation, parking, privacy, drainage, and residential amenity are accommodated within the constraints of a plot.

This study proposes a comparative framework for evaluating three residential setback landscape strategies: hardscape-dominated setbacks, ornamental planting setbacks, and multifunctional landscape setbacks. It establishes a set of spatial, ecological, functional, water-management, and maintenance indicators and introduces a proposed Setback Landscape Performance Index for structured comparison.

The framework emphasises the need to distinguish between design characteristics and demonstrated environmental outcomes. Planted-area percentage, canopy coverage, and permeable-surface percentage can be calculated from appropriately documented site information, whereas claims concerning cooling, runoff reduction, or infiltration require additional measurements or verified calculations.

The three selected residential developments in Chennai provide a context for applying the framework. However, their comparative performance must be established through systematic site documentation, consistent measurements, regulatory review, and transparent scoring. The proposed SLPI also requires further testing before it can be regarded as a validated assessment instrument.

The principal design challenge is to integrate vegetation and environmental functions into available residential setback spaces without compromising necessary access, building operations, safety, maintenance, or applicable development requirements. By connecting landscape planning with measurable indicators and site-specific constraints, the proposed framework offers a basis for more systematic and climate-responsive residential landscape design in Chennai.

ACKNOWLEDGEMENT

The authors acknowledge the Faculty of Architecture, Dr. M.G.R. Educational and Research Institute, Chennai, Ramaniyam Real Estates Pvt. Ltd., Chennai and Navin Housing & properties (P) Ltd., Chennai for academic support, site access or data collection assistance actually provided.

REFERENCES

[1] C. Alexander, S. Ishikawa, and M. Silverstein, A Pattern Language: Towns, Buildings, Construction. New York, NY, USA: Oxford University Press, 1977.

[2] J. Gehl, Cities for People. Washington, DC, USA: Island Press, 2010.

[3] D. E. Bowler, L. Buyung-Ali, T. M. Knight, and A. S. Pullin, "Urban greening to cool towns and cities: A systematic review of the empirical evidence," Landscape and Urban Planning, vol. 97, no. 3, pp. 147–155, 2010. DOI: 10.1016/j.landurbplan.2010.05.006.

[4] T. R. Oke, G. Mills, A. Christen, and J. A. Voogt, Urban Climates. Cambridge, UK: Cambridge University Press, 2017.

[5] R. T. T. Forman, Urban Ecology: Science of Cities. Cambridge, UK: Cambridge University Press, 2014.

[6] S. T. A. Pickett et al., "Urban ecological systems: Scientific foundations and a decade of progress," Journal of Environmental Management, vol. 92, no. 3, pp. 331–362, 2011.

[7] N. H. Wong, C. L. Tan, D. D. Kolokotsa, and H. Takebayashi, "Greenery as a mitigation and adaptation strategy to urban heat," Nature Reviews Earth & Environment, vol. 2, pp. 166–181, 2021. DOI: 10.1038/s43017-020-00129-5.

[8] S. Dietz, "Low impact development practices: A review of current research and recommendations for future directions," Water, Air, and Soil Pollution, vol. 186, pp. 351–363, 2007.

[9] D. B. Booth and C. R. Jackson, "Urbanization of aquatic systems: Degradation thresholds, stormwater detection, and the limits of mitigation," Journal of the American Water Resources Association, vol. 33, no. 5, pp. 1077–1090, 1997.

[10] U.S. Environmental Protection Agency, Green Infrastructure: Opportunities to Reduce Urban Stormwater Impacts. Washington, DC, USA: U.S. EPA.

[11] C. C. Marcus and C. Francis, Eds., People Places: Design Guidelines for Urban Open Space, 2nd ed. New York, NY, USA: John Wiley & Sons, 1998.

[12] J. D. Hunt and J. R. Evans, Landscape Architecture: An Introduction. London, UK: Routledge.

[13] K. Lynch, The Image of the City. Cambridge, MA, USA: MIT Press, 1960.

[14] I. McHarg, Design with Nature. New York, NY, USA: Natural History Press, 1969.

[15] A. C. van den Berg, J. Maas, R. A. Verheij, and P. P. Groenewegen, "Green space as a buffer between stressful life events and health," Social Science & Medicine, vol. 70, no. 8, pp. 1203–1210, 2010.

[16] S. Pauleit et al., "Urban landscapes and sustainability," in Urban Ecology: Patterns, Processes, and Applications. Oxford, UK: Oxford University Press, 2011.

[17] M. E. A. Gill, J. F. Handley, A. R. Ennos, and S. Pauleit, "Adapting cities for climate change: The role of the green infrastructure," Built Environment, vol. 33, no. 1, pp. 115–133, 2007.

[18] E. G. McPherson, J. R. Simpson, P. J. Peper, S. E. Maco, and Q. Xiao, "Municipal forest benefits and costs in five US cities," Journal of Forestry, vol. 103, no. 8, pp. 411–416, 2005.

[19] D. J. Nowak, D. E. Crane, and J. C. Stevens, "Air pollution removal by urban trees and shrubs in the United States," Urban Forestry & Urban Greening, vol. 4, nos. 3–4, pp. 115–123, 2006.

[20] M. Santamouris, "Cooling the cities—A review of reflective and green roof mitigation technologies to fight heat island and improve comfort in urban environments," Solar Energy, vol. 103, pp. 682–703, 2014.

[21] A. Alexandri and P. Jones, "Temperature decreases in an urban canyon due to green walls and green roofs in diverse climates," Building and Environment, vol. 43, no. 4, pp. 480–493, 2008.

[22] H. Akbari, M. Pomerantz, and H. Taha, "Cool surfaces and shade trees to reduce energy use and improve air quality in urban areas," Solar Energy, vol. 70, no. 3, pp. 295–310, 2001.

[23] S. T. A. Pickett and M. L. Cadenasso, "Landscape ecology: Spatial heterogeneity in ecological systems," Science, vol. 269, no. 5222, pp. 331–334, 1995.

[24] R. D. Brown and T. J. Gillespie, Microclimatic Landscape Design: Creating Thermal Comfort and Energy Efficiency. New York, NY, USA: John Wiley & Sons, 1995.

[25] J. D. S. McDonnell and A. K. Hahs, "The future of urban biodiversity research: Moving beyond the 'island' model," Perspectives in Plant Ecology, Evolution and Systematics, vol. 15, no. 2, pp. 97–108, 2013. Verify the exact publication details before submission.

[26] T. Colding, "Ecological land-use complementation for building resilience in urban ecosystems," Landscape and Urban Planning, vol. 81, nos. 1–2, pp. 46–55, 2007.

[27] E. G. McPherson, J. R. Simpson, P. J. Peper, S. E. Maco, and Q. Xiao, Urban Forests and Climate Change: A Review of Urban Forests and Their Role in Reducing Urban Heat. USDA Forest Service, relevant urban-forestry publications. Confirm the specific report edition before submission.

[28] Government of Tamil Nadu, Tamil Nadu Combined Development and Building Rules, 2019, G.O. (Ms.) No. 18, Municipal Administration and Water Supply Department, 4 February 2019. Official rules are

available through the Greater Chennai Corporation planning portal.

[29] Greater Chennai Corporation, Town Planning and Building Plan Approval Information. Official online planning resources, Chennai, India. Consult the current portal and applicable rules at the time of submission.

[30] United Nations Human Settlements Programme (UN-Habitat), World Cities Report 2022: Envisaging the Future of Cities. Nairobi, Kenya: UN-Habitat, 2022.

BIOGRAPHIES



Author 1:
Shireen Adeni
Architect
shireenadeni@gmail.com
Chennai
9791183841



Author 2:
Dr.Mohammed Waseem Akram
M.Arch., PhD.
Landscape Architect
Associate Professor
Faculty of Architecture and Design Studies,
arkz6010@gmail.com
larmohammedwaseemakram@gmail.com
mdwaseemakram.arch@drmgrdu.ac.in
Chennai
9962798479