# Categorization of Landscape Elements for Housing Development:
## Practitioners Perspective

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## ABSTRACT

People living in urban areas have an aspiration to be in touch with nature, attractive environments, places where they can recreate, play and have leisure that enhances their health and well-being. To help achieve these desires landscape elements play a vital role and thus become an integrated part of everyday urban life. Resilient landscape can help to achieve “sustainability” at a macro level, “health” at a miso level and “well-being” at a micro level in urban areas. Most people spend maximum time at their home, experiencing various landscape elements during daily routines. These elements knowingly or unknowingly happen to be the part of their life and people get attached to them which also affect their well-being. This paper identifi es the landscape elements that effects people and their housing through a review of literature. The paper also categorizes the identifi ed landscape elements from practitioners’ perspectives that should be created in developing housing for the health and well-being of the residents.

***Keywords:*** *landscape elements, well-being, practitioners, housing development*

## INTRODUCTION

The Global climatic change, mostly attributed to urban growth and degrading natural resources, has been creating risks, especially in urban areas of developing countries. Although no one solution may suit all problems, a better urban landscape on a local scale, may be helpful in providing the much needed resilience to impart health and well-being of residents in the community. Resilience is an ecosystem’s stability and capability of tolerating disturbance and restoring itself. This shall finally lead to environmental sustainability on a global scale. A local landscape, being dynamic and flexible, can become an active agent for urban renewal, contributing to the improvement of the interface among various levels on both a local and global scale. A great deal of effort has been made to study the landscape, not only from the artistic point of view, but also from scientific and technical standpoints (Hernandez, 2003). The role of the environment is less immediate in the human-interaction group,

which includes the issues of social interaction, citizen participation in the design process, and community identity (Matsuoka, 2008). People living in urban areas have an aspiration to be in touch with nature and attractive environments, places where they can recreate, play and have leisure that enhances their health and well-being. K. Lynch in his book (*The Image of the City*, 1960) wrote that the people's reaction to urban environments is the result of their perception and memory of a particular city. In this respect, landscapes elements can have a major influence on developing quality experiential and restorative everyday landscapes as 'nearby nature' for urban people. People go to various places throughout their day to day routines; institutional areas, commercial areas, and recreational areas. Among the various places, the residential area should especially satisfy people because they spend quality time there. As living standards of people improve, they increasingly demand better housing environments and landscapes, which are gradually becoming one of the key indicators for the housing development.

Landscape elements are all around; they are a vital part of everyday urban life. People encounter various landscape elements during daily routines in the housing areas: the pathways that residents use on their way to school or work and the places where children play. The lawns with plants, trees, ground covers and greenery offer a calm and relaxing atmosphere to the residents. The parks are where residents enjoy sports. Some water bodies, like fountains or waterfalls, offers visual coolness. While the open spaces with pavements are where residents walk or jog. Spaces that are provided with street furniture are areas where they can sit and relax; or simply be somewhere quiet to get away for a moment from the bustle of a busy daily life. These elements knowingly or unknowingly became a part of residents' life. Memories are made of these elements through people's attachment to their surroundings. Housing has been varying its forms and structural mode throughout the history, in response to socio-economic factors as well as climatic conditions and geographic locations. Resilient landscapes are effective at all levels as sustenance to the environmental, economic, social and cultural values of communities. Housing development means to construct dwelling units along with the infrastructure and site development. Though there may be a striking similarity between sites, one thing is definite: no two sites are identical. Some of the site's characteristics are natural features, and others are man-made (Ingels, 2009). Through a literary review this paper identifies the landscape elements that affect humans and their housing. The paper also categorizes these landscape elements for the development of housings from practitioners' perspectives through focus group discussions that can influence the health and well-being of the residents.

## METHODOLOGY

The paper is a systematic analysis of existing studies that are significant for identifying and categorizing landscape elements for housing development (see Figure 1). First, the literature was searched and collected using a combination of existing research reports, articles and books on landscape elements and housing. The exploration for the literature began with electronic database from the institute; having access to renowned online resources. Keyword and phrase searches were undertaken to identify articles related to landscape elements and housing development. The following terms were used: landscape, plants, greenery, open spaces, water bodies, community, neighborhood, housing, residential, satisfaction, preferences, performances, health, well-being, human, streetscape, pathways, pavements, visual, social, aesthetics, benefit, perception, spirituality and elements. The search was then refined using terms related to topic Landscape, housing, development, landscape elements and housing development.

In the second step, after consideration of the primarily selected studies, inclusion and exclusion criteria were defined. Those articles covering the rural, agricultural use, policies, nature conservation, ecological impacts, material well-being and hazardous environments were excluded. Only studies related to landscape elements with housing, residential, neighborhood and community satisfaction were included to identify landscape elements. Following this qualitative step a total of 34 studies were reviewed.

In the third step, a table of the relevant articles was prepared that includes information about authors, publication year, and research method. Each relevant key literature was reviewed to identify its research focus. Articles were entered into a table and were classified in relation to apparent content, location of the study, experimental design and methods, underlying concept. The results of the findings from the reviewed articles were synthesized to extract and categorize the Landscape Elements (see Table 1).

In the fourth step, Focus Group Discussions (FDG) among Architects / Urban Planners and practicing professionals from the housing field was conducted for refining and identifying landscape elements for housing developments. The overlapped categories / sub categories were be integrated according to their applicability and were considered during the discussions. A set of categories and sub categories of landscape elements according to the degree of relevance as suggested by the experts in the FGD was finalized for housing development.

## REVIEW OF LITERATURE

The literary review began with the influential work of Kevin Lynch's *The Image of the City* (1960) and its classification of landscape elements that are important to the image of urban landscapes. Attention has been given to a later paradigm that emphasizes the role of human evolution and cognition in shaping landscape preferences and thus aesthetics. The fundamental understanding of broader categories for landscape elements were noted in *Basic Elements of Landscape Architectural Designs* (1985), *Residential Landscape Architecture* (2012), books by Norman K. Booth, *Landscaping Principles & Practices*, a book by Ingels, (2009), *Time-Saver Standards for Landscape Architecture: Design and Construction Data* by Harris & Dines (1998), *The Experience of Nature A Psychological Perspective* by Kaplan (1989) and *Landscape Aesthetics: A Handbook for Scenery Management* by Thomas (1995). As evident from the books reviewed, basic landscape elements are comprise of five broad categories; Land Form, Plant Material, Water Bodies, Ground Cover, and Structure. The first, Land Form, encompasses indicators like Plains, Coasts, Forest, Curve, Convex and Concave. The second important landscape category is Plant Forms with main elements like Trees, Shrubs, Herbs, Creepers, and other including

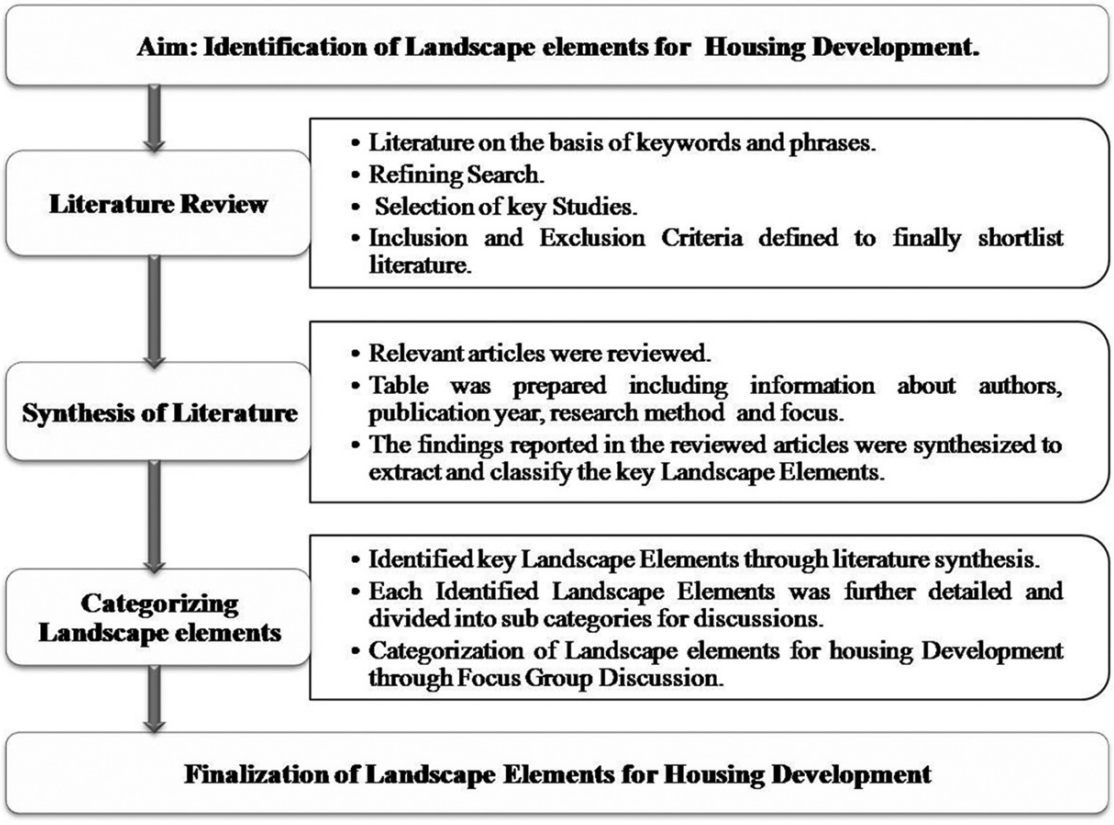



*Figure 1:*
*Methodology Design*

Water plants, Cactus, Bonsai, and Ferns etc. The next set of components is Water Bodies; classified on the basis of its physical state such as Still, Flowing water, Falling, Jet and combined. Ground Cover is the next significant category. It has been further classified under Soft and Hard again based upon the physical appearance and texture. The fifth category, Structure, has indicators like Partitions, furniture, lighting etc has been identified.

Table 1 summarizes in alphabetical order the literary review, with reference to the types of studies. The summary focuses on the five identified broad categories of landscapes. The reviewed literature has illustrated a number of landscape indicators that have significant roles on human beings and their housing. For instance, researchers have agreed with the relationship between landscape elements and human perception. R. Ulrich (1983) found a significant relationship between human affective responses and landscapes or nature. His research claims that when people are exposed to greenery their affective responses (blood pressure, palm sweat, etc.) are significantly lower in comparison to people who are shown urban environments. Ulrich's contemporary Kaplan (1984) has detailed human preference for natural environments over constructed environments from a landscape perspective. Their studies provide clues that nature is vital for human well-being. Based on numerous research studies, they have found that people prefer landscapes that have trees and water and possess spatial qualities of mystery, legibility, coherence and complexity (Maulan, 2006). They believe that people's preference for landscape can be explained by two things: the content of the landscape, such as trees, mountains and water; and the spatial organization of the landscape. The research of Egoz (2011), Creighton (2013), Matsuoka (2008), Ozgunera (2006), Velardea (2007) and Volker (2011), also explain the environments' potentials and views of landscape improves health and wellbeing of humans.

Research also establishes relationships between inhabitants and their housing with neighbourhood environments (Bonaiuto, 2003; Huang, 2006; Jim, 2010; Lee, 2008; Karuppannan 2011; Tiirkoglu, 1997 and Zhang, 2011). Analysis of Fry (2009), Junyan (2007) and Hernández (2003) the visual landscape indicators and its impact on nearby surroundings. Studies of Ishikawaa (2012) and Jessel (2006) focus on street landscaping and its impact on housing. Carl Smith, (2009) conducted an exploratory study to find the effects of housing density on gardens, green space and tree cover. Swanwick, (2009) establish relationships between society, land and landscape through survey and analysis. Research also evaluates the connections between satisfaction preferences of the public and landscape variables (Maruani, 2013; Youssoufi, 2013). Nikodemus's (2005) statistical analysis of a survey reveals socioeconomic conditions and their anticipated impact on landscape structure. Jim's, (2009, 2010) research was based on the assessment of natural landscapes for middle-income housing value. The findings reported in the reviewed articles were synthesized to extract and classify the key Landscape Elements in detail.

## SYNTHESIS OF LITERATURE

Within the field of landscape aesthetics evolutionary theories, Kaplan and Kaplan (1989) explain visual landscape preferences as shaped by our common evolutionary history, claiming that we respond positively to features that enhance survival and well-being***. Man and his activities in the city contribute to define daily living infrastructures including nature, as Resilient Landscapes.*** An important function of landscapes is enabling human spatial orientation. But landscapes also meet basic emotional needs, such as relaxation, identification or stimulation. Landscapes are comprised of the visible features of an area of land. These can include the following physical elements: land forms of mountains and hills; bodies of water, rivers, lakes, ponds and sea; living elements of land cover and indigenous vegetation. Human elements including different forms of land use, buildings and structures are part of the view. These along with transitory elements such as lighting and weather conditions comprise a landscape. According to Beate (2006) the descriptions of different types of land use and structures within a landscape unit are its elements. Various landscape elements such as the landforms, water, etc influence ecosystem resilience and affect human health and well-being. Furthermore, under these elements a variety of the following manifestations are also subsumed: small spatial dimensional relations, as well as individual perceptions (noise and smells); characteristics or shape levels, that are typical combinations of elements, design shapes and proportions. The

**Table 1:** Summary of Literature Review

| S.No | Authors | Study Type | Research Focus | Landscape Elements | | | |
|---|---|---|---|---|---|---|---|
| | | | | Land Form | Plant Material | Water | Structure |
| 1 | Bonaiuto, 2003 | Principal Component Analyses | Relationship between inhabitants and their neighborhood urban environment. | | ✓ | | ✓ |
| 2 | Booth, 1985 | Basic Elements of Landscape Architectural Design | Present the vocabulary, significance, characteristics, potential uses, and design guidelines for Landscape Elements | ✓ | ✓ | ✓ | ✓ |
| 3 | Booth, 2012 | Residential Landscape Architecture | Residential site design for environment and to create outdoor living spaces | ✓ | ✓ | ✓ | ✓ |
| 4 | Creighton, 2013 | Analytical Case study | Relationship between landscape and people | | ✓ | ✓ | |
| 5 | Egoz, 2011 | Case Study analysis | Landscape as a Driver for Well-being | ✓ | ✓ | ✓ | |
| 6 | Fry, 2009 | Analytical | Visual and ecological landscape indicators. | | ✓ | ✓ | |
| 7 | Harris, 1998 | Time-Saver Standards for Landscape Architecture | Design and Construction Data for Landscape elements | ✓ | ✓ | ✓ | ✓ |
| 8 | Hernández, 2003 | Analytical & public survey | Visual impact of buildings on the landscape. | ✓ | ✓ | ✓ | |
| 9 | Huang, 2006 | Analytical & public survey | Relationship between the courtyard design of housing and the residents' social interaction | ✓ | ✓ | ✓ | ✓ |
| 10 | Ingels, 2009 | Landscaping Principles & Practices | Design, installation, and management of Landscaping: Principles & Practices | ✓ | ✓ | ✓ | ✓ |
| 11 | Ishikawaa, 2012 | Empirical study | Street landscape planting ratio improves the dwelling environment | | ✓ | | ✓ |
| 12 | Jessel, 2006 | Perception research | Impacts of streets on the visual landscape. | ✓ | ✓ | ✓ | ✓ |
| 13 | Jim, 2009 | Assessment by hedonic pricing method | Assessment of natural landscape for middle-income housing | ✓ | | ✓ | |
| 14 | Jim, 2010 | Analytical, statistical techniques | Effects of neighborhood parks on high-rise private residential | ✓ | ✓ | ✓ | ✓ |
| 15 | Junyan, 2007 | Case Study analysis | Residential landscapes in the urban context. | ✓ | ✓ | ✓ | |
| 16 | Lynch, 1960 | The Image of the City | Visual quality of the city by studying the mental image | ✓ | ✓ | ✓ | ✓ |
| 17 | Kaplan, 1984 | theoretical analysis | Importance of fascination and coherence effects of the nature context. | ✓ | ✓ | ✓ | |
| 18 | Kaplan, 1989 | The Experience of Nature A Psychological Perspective | Natural environment, people, and relationship between them. | ✓ | ✓ | ✓ | |
| 19 | Karuppannan, 2011 | Exploratory study by Household surveys | Well located open spaces and their role in social sustainability. | | ✓ | | ✓ |
| 20 | Lee, 2008 | Assessment by House hold survey | Relationship between landscape structure and neighborhood satisfaction. | ✓ | ✓ | ✓ | ✓ |
| 21 | Maruani, 2013 | Quantitative analysis | Landscape values expressing prevailing preferences of public. | ✓ | ✓ | ✓ | ✓ |
| 22 | Matsuoka, 2008 | Literature review | Urban landscapes on well-being and behavior of inhabitants. | ✓ | ✓ | ✓ | ✓ |
| 23 | Maulan, 2006 | Discussion Paper | Relationship between landscape preference and human well-being. | ✓ | ✓ | ✓ | |
| 24 | Nikodemus, 2005 | Statistical analysis of survey | Socio-economic conditions and their anticipated impact on landscape | | ✓ | ✓ | |
| 25 | Ozgunera, 2006 | Investigative and questionnaire survey | Public attitudes towards urban naturalistic & formal designs landscapes | ✓ | ✓ | ✓ | ✓ |
| 26 | Smith, 2009 | Exploratory Study | Effect of housing density on gardens, green space and tree cover. | | ✓ | | |
| 27 | Swanwick, 2009 | Analytical & survey | Relationship between society, land and landscape | ✓ | ✓ | ✓ | |
| 28 | Thomas, 1995 | Landscape Aesthetics: A handbook for Scenery Management | Vocabulary and a systematic approach for determining the relative value of scenery | ✓ | ✓ | ✓ | ✓ |
| 29 | Tiirkoglu, 1997 | Factor Analysis & household survey | Residents' satisfaction measuring quality of housing environments. | | ✓ | | ✓ |
| 30 | Ulrich, 1984 | Analytical & survey | Window views may influence recovery from surgery | ✓ | ✓ | | |
| 31 | Velardea, 2007 | Literature review | effects of visual landscapes on health and well-being . | ✓ | ✓ | ✓ | ✓ |
| 32 | Völker, 2011 | Literature review | Impact of water on human health and well-being | | | ✓ | |
| 33 | Youssoufi, 2013 | Comparative study with Statistical models | Connections between satisfaction and landscape variables. | ✓ | ✓ | ✓ | ✓ |
| 34 | Zhang, 2011 | Analytical & public survey | Relationship between the visual elements and aesthetic response of neighborhood | | ✓ | | ✓ |

overall area perception, that is the ''character'' or space level of a landscape is the result of a characterization process that classifies, illustrates and describes areas that are similar in appearance. Based on results from the detail literature review, the broad categories of Landscape Elements were identified. The landscape elements: landform, plant materials, water and structure are described in terms of their classification, appearance and features.

## LANDFORMS

Landforms are significant elements in exterior environments. Besides aesthetic character of outdoor spaces it also influences spatial perception, views, drainage, outdoor environment, microclimate, and built forms. It also affects human health, well-being and housing values through visual characteristic due to natural features and location. As all other elements in the landscape rest on the ground plane, the formation of the land is one of the first considerations in planning and design. Landforms may be classified and studied in a number of different ways including scale, character; steepness, geological origin, and shape. (Refer: Fig 2)

Landform permits a more sprawling and multidirectional arrangement, and can be considered as a setting or stage for the placement of other design elements and functions. Its shape, size, properties and texture are the main determinant of various activities like cultivation, agriculture, building structure and design along with leisure activities like playground, parks etc. While each of these classifications of landform is a helpful aid in analyzing and understanding topography, form is one of the more important categories for landscape architects concerned with both the visual and functional qualities of the land (Booth, 1985). To a larger extent the characteristics of landform ascertains the appearance and function of buildings along with other landscape elements such as plant material, pavement and water.

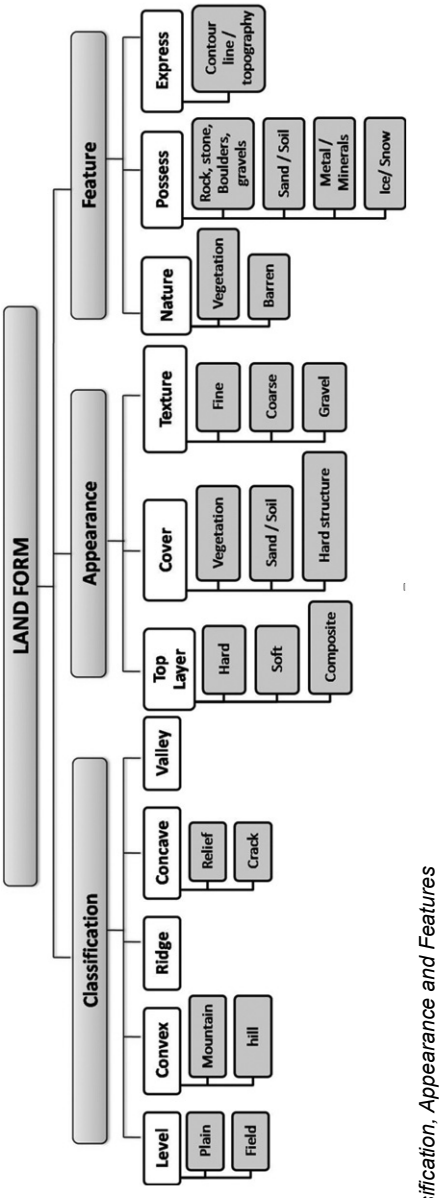



*Figure 2:*
*Landform: Classification, Appearance and Features*

## PLANT MATERIAL

The visual characteristics of a plant material have a direct bearing on order and unity of a design, visual variety and mood or feeling of the outdoor environment. Plant materials are an exceptionally important element of landscape for enhancing outdoor environments. Plant materials may be

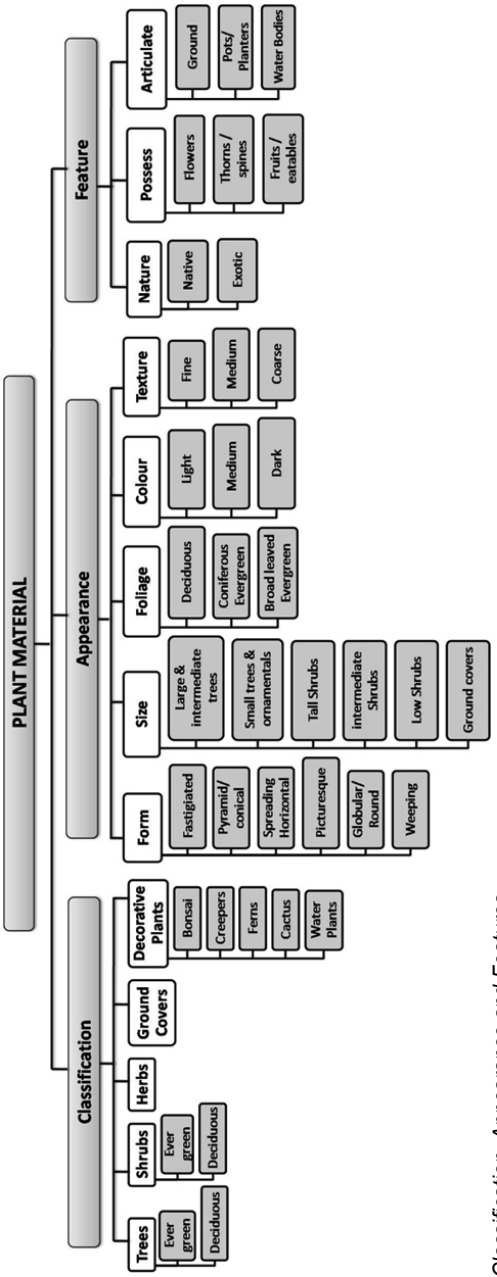



*Figure 3:*
*Plant Materials: Classification, Appearance and Features*

classify and studied in a number of different ways based on the categories of evergreen and deciduous plants that have characteristics of various foliage, flowering and fragrance. (Refer: Fig 3)

The most significant characteristic is that plant materials are breathing, organic and growing. Thus they are dynamic; that is, they are constantly changing color, pattern, texture, opaqueness, and overall character with time (Booth, 1985). The presence of plants in the vicinity provides aroma, coolness and dramatic views from attracting the presence of butterflies, birds etc. Various plant materials can also be utilized for medicinal uses along with the fruits and vegetables. Varieties of plants are also used for hedging, partition, screening.

## WATER

Water as an element include fishponds, reflecting pools, fountains, waterfalls, streams, swimming pools and spas, and combinations of these. The uses of water are limited only by imagination (Ingels, 2009). Water features, may be classified and studied in a number of different ways including static and dynamic features (Refer: Fig 4). Still water containers define the form assumed by water. Underwater forms and conditions on the surface water effects humans. Falling water refers to water moving solely under the influence of gravity, while spouting water refers to water discharged or displaced under pressure, countering or complementing gravitational movement includes waves and spouts / jets of water. The wave effect, while a viable alternative visually and mechanically, has not been widely applied because of the excessive energy requirements and the considerable bulk of the activating mechanisms (Harris, 1998). Falling water may be further categorized as free-falling, flowing, or cascading. Free-falling water moves vertically without contacting any surfaces and is most often expressed as a full sheet. Flowing water is, by contrast, constantly in contact with the container. Cascading water is a combination of flowing and falling water. A cascading water wall differs from a smooth or aerated water wall in the sense that water moves over a texture comprised of projecting forms of sufficient dimension to divert the flow laterally or to cause it to spring free of the vertical surface, thereby resulting in a pattern of free-falling water, flowing water, and dry areas. Water features also embrace night lighting, which can bring their sparkle and movement into the night. The splash and sparkle of water make it appealing in the landscape. (Refer: Fig 4)

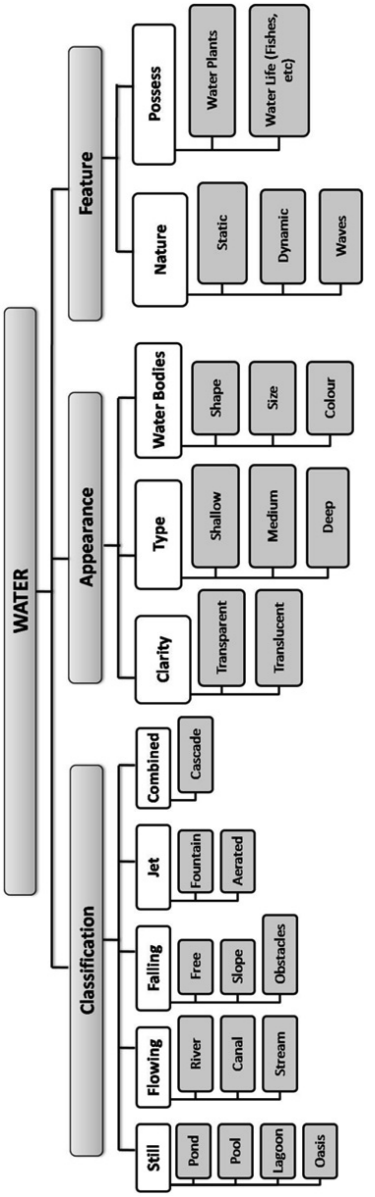



*Figure 4:*
*Water: Classification, Appearance and Features*

## STRUCTURE

Structure dominance can be created on the residential site using an attractive a piece of sculpture, a prominent rock, or a spot of light at night. Each can draw the eye's attention in the landscape (Booth, 2012). Hard surface such as paving, fencing, and walls frequently create strong lines in the landscape. The viewer's eye will willingly follow the line to its end. Therefore it is important that the line lead somewhere warranting attention. Structures make an aesthetic contribution, valued more for their beauty than for their utility. As such they serve more as enrichment items than as architectural or engineering features. Structure secures a children's play yard, confining a pet, blocking an outsider's view, supporting the weight of a vehicle, or providing protection from the rain. Some materials will be more appropriate than others. The materials used could also mimic those used in nearby enclosure components or even materials used in the facade of the building. There are many types of Structure features that may be classified and studied in a number of different ways constituting elements of static and dynamic (See: Fig 5).Lighting ensures that the enjoyment of the landscape need not end when night falls. By including provision for the evening illumination of the garden, the landscape designer adds these and other values to the design: that of increased time of use and the provision for greater safety and security for users. Lighting can also create special effects such as colored lighting, silhouette lighting, shadow effects, or patterns against buildings Added light maintains the same visual relationship between indoors and outdoors that exists during daylight hours. (Refer: Fig 5)

## FOCUS GROUP DISCUSSION

Based upon the review of literature, four broad categories of landscape elements were identified. With an objective to refine and consolidate elements in identified categories a focus group government officials from Housing & Environmental Development and State Town Planning Institute, local administration, Urban Administrative & Development and officials from local urban bodies along with academicians from reputed institutes of Architecture and Planning.

To sensitize the focus group, a brief presentation was made to initiate a discussion. Overlapping categories / sub categories were rearranged. The categorizing

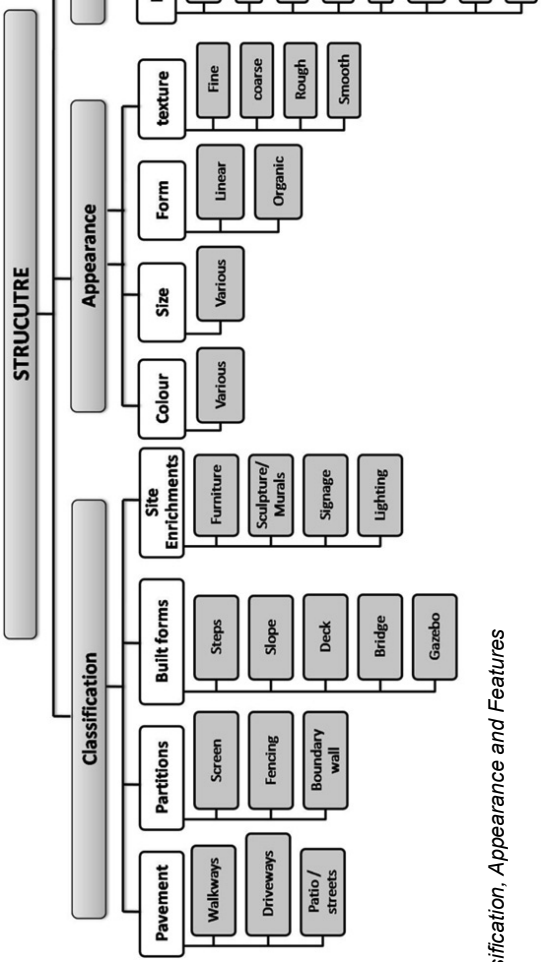



*Figure 5:*
*Structure: Classification, Appearance and Features*

of landscape elements was re-organized by integrating them according to their degree of relevance as suggested by the group members. During the discussion all the broad categories were presented and discussed one by one under the specific headings of each classification. The appearance and features of the identified landscape elements are shown and detailed in Fig – 2, 3, 4 & 5. The first discussion centered on landforms. Participants claimed that landform, being a natural asset, could not be considered as a landscape attribute to housing development. The logic behind the claim was that every unique landform contributes to housing in a subjective manner, so it should not be considered as a direct indicator. Rather it was suggested that the articulated landforms may be considered under a new category called Ground Covers. This category was compiled by taking elements from landform and structure. As per the discussion, the category of Groundcover was sub-classified; Hard, comprising of paved pathways, walkways, roads, pavers, footpaths, and Soft, comprising of lawns, turf and flowerbeds.

The discussion continued with the categories of Plant Material, Water and Structure. Grass, which was initially categorized under plant material, was reassigned to the newly identified category of Ground Cover. This suggestion was made by the academicians in the discussion group. Similarly Herbs were to be placed under the subcategory of shrubs in the Plant Material category. The group also recommended that the category of Water can be renamed as Water Bodies while Structure be renamed as Built Forms. The final categorization was conceived towards the end of the consultation with modifications and additions to the new category named Ground Cover as detailed below. (Refer: Fig 6)

## CONCLUSION

This quest started with an observation that people affect the landscape, and in turn, the landscape affects people by means of its appearance. People perceive landscapes and reflect upon them. However human perception appears to be critical for understanding the interactions between humans and landscapes. The study was initiated for the purposed of identifying landscape elements for housing development. The understanding from secondary literature provided a broad overview of various landscape elements. The result includes

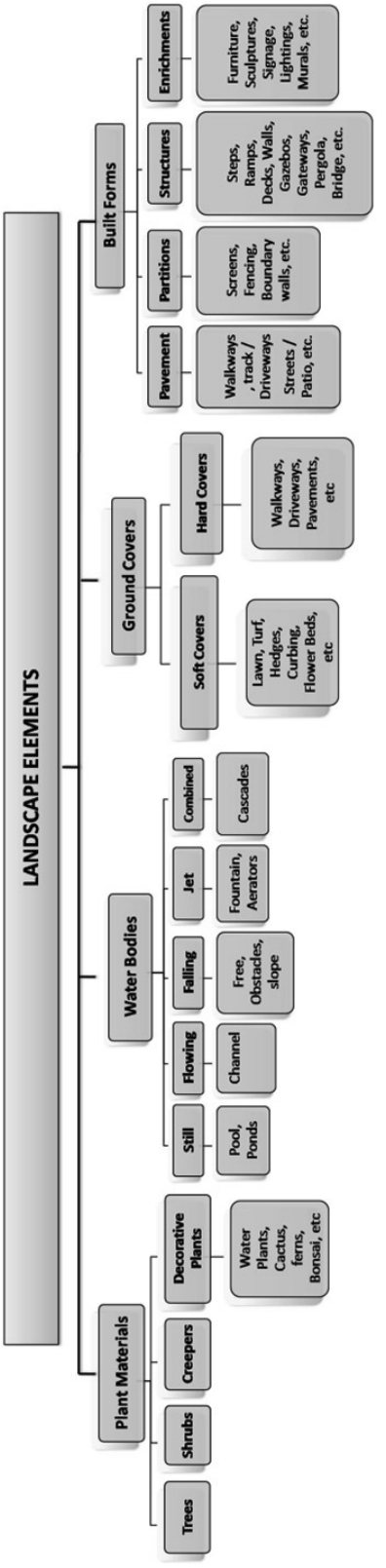



*Figure 6:*
*Categorization of Landscape Elements*

both information found in the literature and the focus group's discussion that identified the landscape elements.

Based on the literature review, landscape elements for housing development were identified. The focus group's discussion was conducted to categorize landscape elements into five categories and fifteen subcategories for an improved understanding of the multifaceted, affective character and effect of landscape on housing. Resilient landscapes is a qualitative criteria allowing the conception of multifunctional landscapes that can monitor environmental performance along with a check on adulterated urban reclamation and can enhance human health and well-being. This categorization is not specific for housing only; it may also prove worthwhile for wider applications along with resilience of ecology and environment. A range of specific empirical and experimental settings could be identified for future work. Namely, more research needs to be carried out on the satisfaction of the residents in response to the landscape provided in their housing vicinity.

The categorization suggested may help both researchers and practitioners analyzing the various effects of landscape elements on housing development. It remains a challenge to stretch the concept to various residential environments, which have not been included in this paper. In the light of the stressful life of the urbanites the environmental and health benefits from a better landscape could clearly be identified, but there is still little respect for landscape in urban planning especially in housing developments. **Resilient landscapes enhance the conservation and sustainable use of those systems and their contribution to human well-being.** There is a need to introduce the prospective findings from **Resilient** Landscape research concerning human wellbeing, health and sustainable environment into urban planning and Housing Development.

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