

# FACTORS AFFECTING IMAGEABILITY AND LEGIBILITY OF AN URBAN ENVIRONMENT: INSIGHTS FROM COLOMBO, SRI LANKA

W. K. S. Suvimali\*, Amanda Rajapakshe

Department of Architecture, University of Moratuwa, Sri Lanka

## Abstract

*A person's orientation in the environment, basically depends on the visual perception on the physical elements in his surrounding environment and most importantly urban places should express an identity and a clear identifiable image. However due to the rapid urbanization and industrialization mega dynamic man-made developments commenced all over the world. Most of the buildings only focused for functional purposes. Because of this, user has to face complex experience in an urban environment. When people are unable to identify spaces precisely to make clear orientation, they get into difficulty in an urban setting. Imageability and legibility are always bound with physical setting of the environment. The aim of this study is to understand and inquire the qualities of organization of the landscape elements in identified urban space and how it influences the memory of people and how they help to read the city to recall the city spaces. The case study is a chosen sector within Colombo 07. It is a mixed residential zone recently upgraded with urban design and landscape proposals to increase the connectivity and permeability within. The study is based on a survey, including questionnaire and mind maps to collect data on the subject. Through a questionnaire highly imageable and legible places are identified, and through the same questionnaire landscape elements and their qualities of organization which affect to imageability and legibility are identified. Based on the summary and analysis of the data indicated two highly imageable and legible places in the area. According to the conclusion of data analysis the position, shape/form, number of elements are the major qualities of organization of landscape elements which highly affected the Imageability and Legibility in an Urban environment, suggesting that this information could be used more effectively to refurbish existing and design new urban landscapes as public spaces.*

**Keywords:** Visual perception, Imageability, Legibility, urban environment, Landscape elements

---

\*Corresponding Author: W.K.S.Suvimali; E-mail- sewwandikasuvimali@gmail.com

## Introduction

We should be able to understand our relative position to identify a location in a surrounding environment in order to move freely without any “fear of being lost”. So clear orientation can make people explore the environment. To reach a clear orientation people should be able to perceive a clear image of surrounding environment. We usually gather information from our surrounding environment through our senses, Vision accounts for 87% of human perception. and this process begin as soon as we are born and open our eyes.

“We infer that primitive man is normally deeply attached to the landscape he lives in; he distinguishes and names its minor parts. Observer refer to the multitude of place names, even in uninhabited country, and to the extraordinary interest in geography. The environment is an integral part of primitive cultures; the people work, create, and play in harmony with their landscape. Most often they feel completely identified with it, are loath to leave it: it standards for continuity and stability in an uncertain world” (Lynch, 1960)

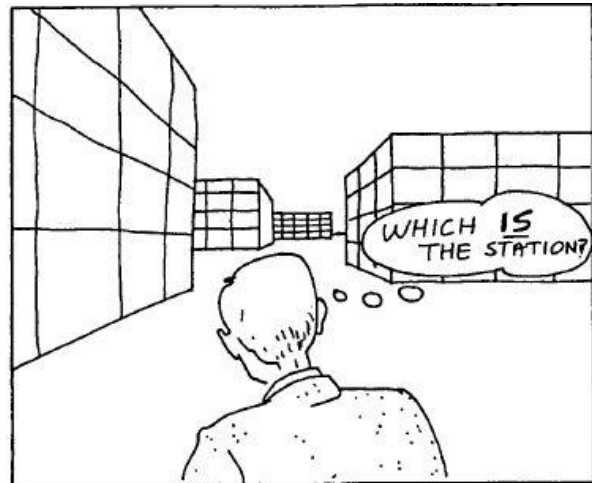


Fig. 1- man should be able to identify environmental elements

Source – (Bentley I , Alcock A, Murrain P, McGlynn S, Smith G, 1985)

Primitive man used the natural elements as their references in way finding, sun, moon, stars, trees, mountains, wind, water bodies etc. but in the present environment and this phenomenon changed. Man-made environment is becoming more prominent than natural environment. So physical compatibility of the urban environment and visually and physically comfortable environments are reduced. Since Sri Lanka is a tropical country, with harsh environmental conditions and when urban areas become like concrete jungles, landscape designs become a necessity. Through a good landscape design, cities can made to be livable, comfortable and the functionality of the city increased by legibility and the imageability of the environment.

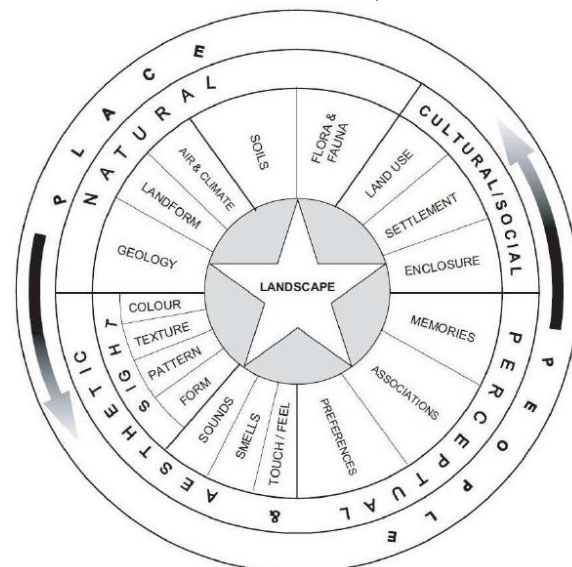


Fig. 2- people and places  
 (Source – (Ozyavuz, 2012))

## Research issue and Problem statement

In the past environment was perceived as a whole and humans were a vital part of it. But Due to the rapid urbanization and industrialization megadynamic man-made developments commenced. Most of them build only focused for functional purposes. So in most urban areas these huge high rising concrete masses were the

identification and orientation. As a result of this, observer/user had to face complex experience in urban environments giving rise to negative impacts.

Some negative impacts are

- Reducing the physical compatibility of an environment,
- Reducing visually and physically comfortable environment

A person's orientation in the environment, basically depends on the visual perception on the physical elements in his surrounding environment. But this rapid development causes the Lack of identity of the environment in urban areas. When people are unable to identify spaces precisely to make clear orientation, they get confused in an urban setting.

The study proposes to identify how visual perception on landscape elements helps to strengthen the imageability and legibility of an urban environment and to identify the factors and characteristics which help in that process.

### **Objectives of the study**

The study started with the literature survey of imageability and legibility of an urban environment. The selected case was examined for the imageability and legibility in relation to the organization of landscape elements. With a review of existing theories author developed a framework through literature review to identify the factors affecting to imageability and legibility. Main objectives of the study were to identify the characters and qualities of landscape elements which make environment legible, to identify the contribution of landscape components and their qualities of organization which increase the visual quality and physical quality in urban environment and also to identify how people perceive landscape components and what are the significant qualities of these which support to build cognitive map in observers' mind.

### **Imageability & legibility of an urban environment**

#### **Imageability**

"Imageability: that quality in physical object which gives it a high probability of evoking a strong image in any given observer" (Lynch, 1960)

Concept of "imageability" is firstly introduced by Kevin Lynch (1960) in his book "The image of the city". Lynch said that people form environmental images by referencing dominating physical elements in the environment and understanding the relationship of these elements. It can simply be termed as the image making ability of a person. This image making ability of a person vary with observer's associate with culture, space, and time. Lynch mentioned that, there are other influences on imageability, such as social meaning of an area, its function, history and also its name.

"Urban imageability is a product of the perception of visual forms and of the conception of social significance" [Gulick.J (1963) as cited in (De.Silva, 2011)]

According to Lynch "it is that shape, colour, or arrangement which facilitates the making of vividly identified, powerfully structured, highly useful mental image of the environment. It might also be called legibility, or perhaps visibility in a heightened sense, where objects are not only able to be seen, but are presented sharply and intensely to the senses."(Lynch, 1960)

According to Lynch, if a city is highly imageable: well identifiable, well-structured and memorable, it is a great city for inhabitants and they move freely without "fear of being lost".

## Legibility

A person's orientation in the environment, basically depends on the visual perception on the physical elements in his surrounding environment. It is also called the quality which makes a place readable, ability of understand the environment or "legibility of the environment". Understanding of the spatial relationship between elements make a legible environment. People in the urban environment should have the ability to recognize and organize elements in a coherent pattern, it is also engaging with way-finding process. In a legible and imageable environment people never feel lost. In that kind of environment people feel safe and secure and they move freely to their destination. Humans always requires some identification to find their way. Coherence of a landscape is arranging landscape components in a clear way. Coherence and legibility are strongly connected to understand a place and to feel safe. So degree of coherence in environment impact to the legibility in that environment by its users. More coherent place is more legible; so people make sense of that kind of places and they feel safe. Lynch defines legibility as "in the ease with which [a city's] parts may be recognized into a coherent pattern". (Lynch, 1960) According to Lynch, legibility is the key basis for the sense of place. It makes a place psychologically comfortable for observer. "The degree of legibility depends on the ability of space to form a mental image" (Lynch, 1960).

If people can identify or recognize physical structure of the environment easily, that environment is legible. Appleyard described three factors that affect to identify the structure better. They are form attributes, visibility attributes and use and significance attributes.

**Form attributes** are prominence of relief of built form. If structure have a clear and sharp relief (outline, line, curves or shape) it can be easily identified, because it looks different from the surrounding environment. It also can be easily identified from the ground. **Visibility attributes** are depending on the location. When the location is more visible, element can be identified and recognized easily. **Use and significance attributes** are the identification of the structure by its main use. For instance, we identify or recognize hospitals, markets, temples, police stations like places from its major use. Their function or use can be better identified than its form of structure. So the structure being memorable or recognizable by its use.

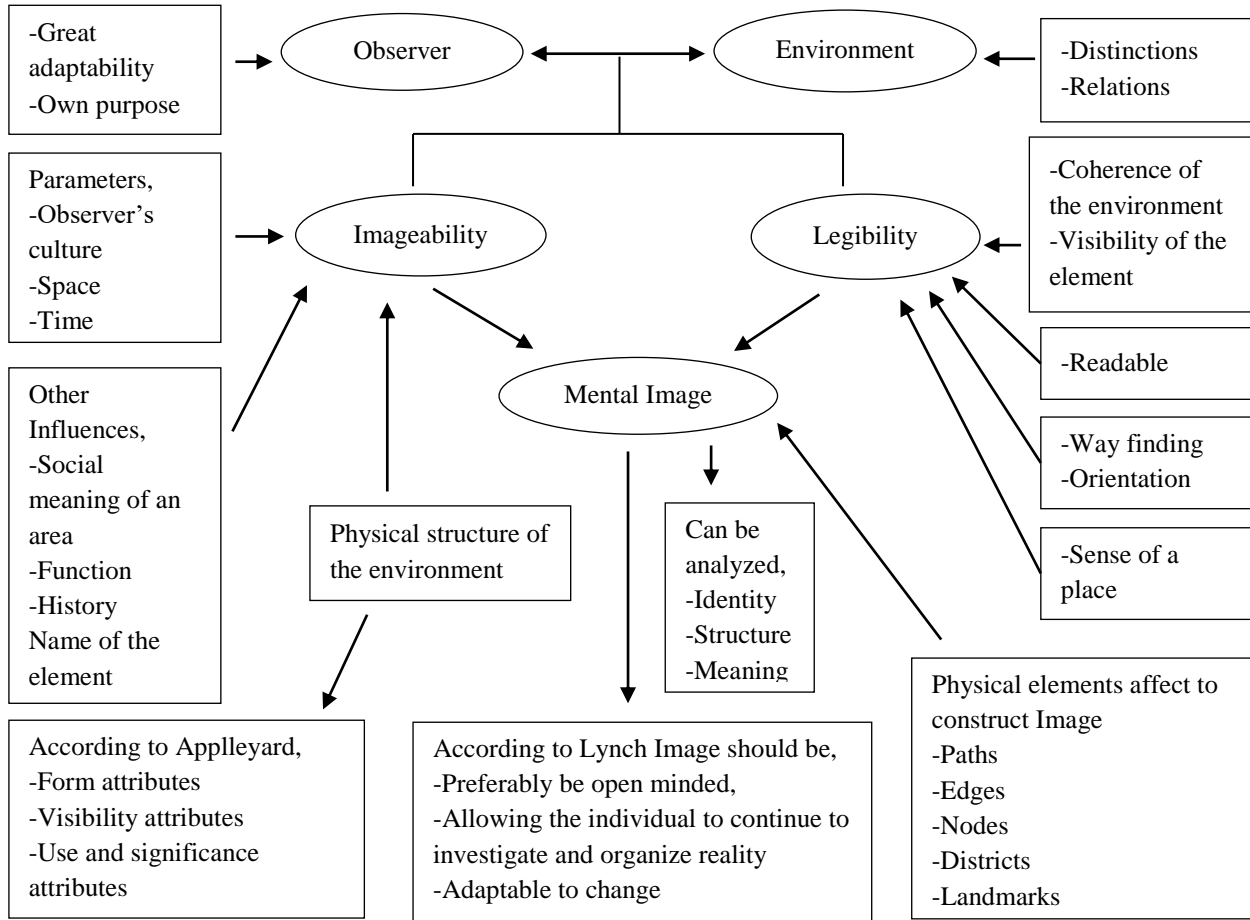
## The environmental image and the factors affecting to environmental image

"The environmental image as described as a 'mental picture' by which is a product of experiences, attitudes, memories and immediate sensation used to interpret information of the human environment" Boulding (1961) as cited in (Opanayake, 1998). He further described about four essential factors of the image, those are spatial aspects, relational aspects, value and emotional aspects. Lynch analyzed an environmental image into three components:

**Identity** - "a workable image requires first the identification of an object, which implies its distinction from other things, its recognition as a separable entry" (Lynch, 1960). Identity is an ability to identify or remind a place. Indeed, it mention that, object has the quality of 'figure' in 'figure ground relationship'. Lynch strongly state that; 'physical attributes of the element are the important factors to identify elements'.

**Structure** – "the image must include the spatial or pattern relation of the object to the observer and to other objects" (Lynch, 1960). Structure is the sense of the relative position of elements in whole fabric. People have various approaches of structuring environment.

**Meaning** – “object must have some meaning for the observer, whether practical or emotional. Meaning is also a relation, but quite a different one from pattern and relation”(Lynch, 1960). People give meanings to the elements according to their experiences or past memories. And also elements have meanings according to culture, history, value or location.



**Fig.5** - factors affecting to Imageability and Legibility  
 Source – Compiled by author

### Visual Landscape Perception

Visual Landscape perception is always bound with physical setting of the environment. Perception is simply described as “how people see things”. Vision helps to evoke our memories and experiences. People observe physical setting of the surrounding environment and they understand it through the observation. Then they analyze what they see and finally they evaluate the environmental image. Environmental image helps people to understand and react to the environment. Each and every person has their own perception on environment and they react differently. “Environmental images are the result of a two-way process between the observer and his environment. The environment suggests distinctions and relations, and the observer – with great adaptability and in the light of his own purposes – selects, organizes, and endows with meaning what he sees” (Lynch, 1960). When people observe environment they perceive it on their own way, but it doesn’t include what exactly in environment, it has what person understand through what he sees in the environment in order to transformed by him in the way he assumes it to be. It depends on the observer and the way he perceives it. “Landscape is composed of not only of what lies before our eyes but what lies within our

heads.” D.W. Meinig (1979) as cited in (Ozyavuz, 2012). So each and every person have image of the environment according to his own perception, and they use it as a reference to understand and respond to the events, persons, characters and objects that exist in the environment we live.(Lynch, 1960) Lynch said about two main factors affect to building image,

- 1 The ability of a person to sense and perceive the environment towards making an image
- 2 The capacity of an environment to stimulate person’s sensation

An image is a result of this process and it depends on the sensing, perception and cognition. Different environments perform differently in process of image making. Some environments resist and some environments are facilitating for it. Any given shape or form has the ability of evoking a strong image in observer’s mind. It can be high or low probability, and vary with the observer. This probability depends with the observer groups such as age, sex, culture, occupation, temperament, or familiarity. Each individual has his own image, but there seems to be relationships between members in same groups. They have nearly common image. The common image perceived by large number of people in a city can called as “public image”.

### **Factors affecting to visual Landscape perception**

Simon Bell mentioned about environmental perception in his book “**Elements of visual design in the Landscape**”, he mentioned four basic elements which help to identify and understand visual qualities in landscapes. (Bell, 2004)

- Point - it defines specific position in space. Point is strictly speaking and it has no dimension in space. It can indicate by crossed or focusing lines, a point of light etc.
- Line – when a point extends to one direction it creates a line. Lines define the edges, planes and boundaries. Lines have its own properties in the way it is created (fuzzy, irregular or discontinuous)
  - Natural lines – stream patterns, tree trunks, edges of vegetation patterns or sky line etc.
  - Man-made lines – field boundaries, roads, building edges etc.
- Plane – When a line extends, it creates a plane. Line is one-dimensional and plane is two-dimensional and it can be flat, curved or twisted. Planes doesn’t have depth or thickness, it only has length and width. Undisturbed calm surface of water in a lake or a pool can consider as near perfect natural plane. When planes are located in different positions, it creates enclosed spaces and can use for different functions, like floor, walls, or roof planes.
- Volume – Two-dimensional plane extended and create a volume (solid or open).
  - Solid volume – a volume or mass in space created by three dimensional elements. Buildings, landforms, trees, etc. are solid volumes. Can be geometric or irregular.
  - Open volume – a volume of space created by enclosed other elements such as planes. Deep valleys, space beneath the forest canopy, etc. are open volumes.

Normally these elements are found in combination in natural environment. Hard to see one of them exist in isolation. These basic elements can be seen in relation to light, colour, time, and movement.

### **Variables**

Then he mentioned about variables of organization of these elements. Those variables are:

- Number – In the environment, elements exist in single or as a group (as a number). When that number is higher, it shows more complexity. When element exist single, it has

little reference with its surrounding. But being repeated, each element has visual relationship with others, create spatial effect and more complex pattern.

- Position – there are three primary positions, Horizontal – parallel to horizon, Vertical – perpendicular to the horizon, Diagonal – between horizontal and vertical. Positions can be related to each other. It is about the composition of the element in the environment.
- Orientation – Elements which positioned according to certain direction. Orientation can be three types, according to compass direction, Relative to the ground plane, Relative to the viewer. Mostly lines in the landscape create the sense of direction and guide the observer
- Size – Dimensions of elements, Common size variations are tall/short, big/small, wide/narrow, shallow/deep.
- Shape (form) – Shapes range vary from simple to complex and geometric to organic. Complexity of shapes affect to unity of the design, most of natural shapes are irregular, some small scale natural shapes are geometric. But natural organic forms are very rare in the environment, or form of the element gives the identity to the particular element in the environment. Shapes of Man-made structures are organic.
- Interval – Spacing between elements can be called as interval. It can be variable or equal, regular or irregular. It can create formal and informal patterns. Mixed intervals create a complex pattern. Equal intervals create sense of stability, regularity, or formality.
- Texture – Texture relative and ranging from fine to coarse. Related to interval. Depend on the size of the elements and also size of the intervals between them. Man-made elements usually show the different textures, and also texture is always varying with the material. Texture vary with distance of the viewer from the elements.
- Density – density depends on the texture of the elements and the interval between them. Density is number of units of an element within a given area. Urban environments mostly show high density patterns related to function.
- Colour – Colour can be described by hue, lightness and saturation and also some colours can be described as warm or cool colours. Colour helps to give identity to elements.
- Time – Appearance of all the objects in the landscape visually change according to the time. Time gives the sense of natural cycle. Seasonal changes of the environment happen according to time intervals. It clearly shows through landscapes. Changes can occur according to time intervals
- Light – people need light to perceive environment. Source of the light can be natural or artificial. Direction, quality and amount of the light are the important qualities of light which help to perceive object. There are many factors which affect to the quality of the light, latitude (high or low), angle of the sun, condition of the sky (cloudy or clear sky), moisture in the atmosphere below the cloud level, shadow casting of the elements happen because of the light. Colour vision depend on the light
- Visual force – visual force can describe as the sense of movement which are representing in static object or image. The position, shape and lines of the object are the factors which represent the visual movement or focus.
- Visual inertia – The objects which not show visual focus. Heavy, ultra-stable, horizontal forms do not show visual focus.

These variables of landscape elements affect to organization of them into patterns in landscapes. And they affect to visual perception of landscape elements and create visual quality of the environment.

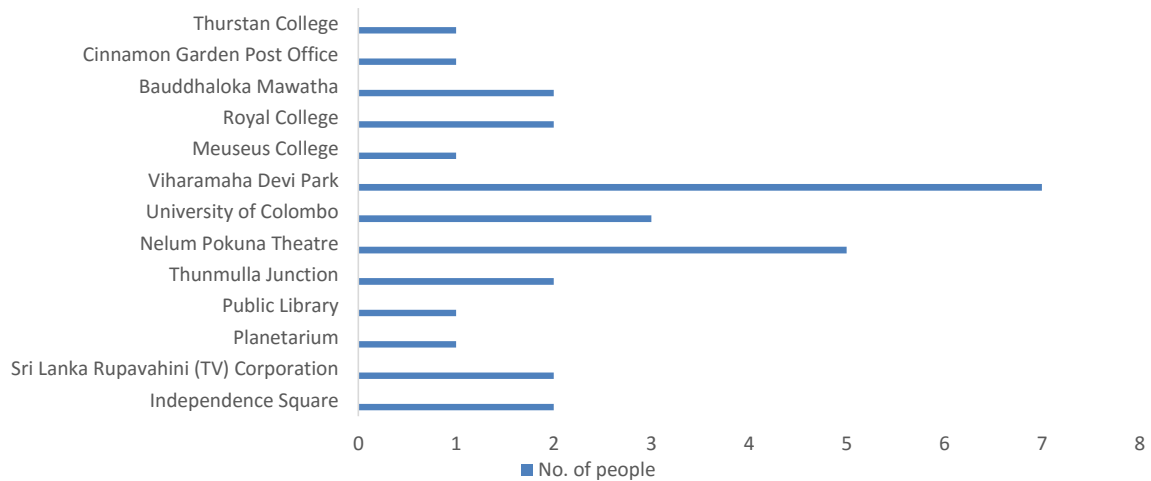
## **Methodology and basis for selection of case studies**

The study starts with an examination of existing notions of imageability and legibility of an urban environment. A place is being examined for the imageability and legibility in relation to the organization of landscape elements. The study will begin with a review of existing theories and develop a framework through literature review and identify the factors affecting to imageability and legibility. And also identify what are the characters and qualities of landscape elements which make environment legible. Then apply those theories for selected samples. The study is based on a survey, to identify the ideas, opinions of people of their city and their mental image of the city. By using a questionnaire to identify factors affecting to visual landscape perception to enhance imageability and legibility. The aim of the study is to understand and inquire the characteristics of the landscape elements in the urban space and how it influences the memory of the people and how they help to read the city to recall their city spaces. Towns and cities are developed over last hundred years, and Colombo city too has developed rapidly. Because Colombo city is the business capital in the country, it rapidly developed and became urbanized. Physical structure of the city has changed; complexity of buildings has increased making a huge man-made built environment. There are identified urban spaces in Colombo city and the study analyze this landscapes that strengthen the mental image and what the landscape elements that contribute to enhance Imageability and Legibility of the city. Selected case study is 'Colombo 07' area and the study is based on a survey, including questionnaire, observation, and mind maps. Relevant data required for the basic analytical study of selected case has been collected at random selected 30 people during the day through a questionnaire. In the questionnaire the first question asks regarding the most memorable places in Colombo 07 area followed by the landscape elements in those areas which affects the memory of the place. Then to select the qualities of organization of those landscape elements which affect the memory of place through given qualities and followed by requesting to draw a mind map of the area. Through the questionnaire highly memorable places, landscape elements and the qualities of organizations are identified and photographs, maps and sections used to analyze the findings through questionnaire.

## **Findings and analysis**

After analyzing thirty selected persons in the questionnaire survey, responses were as follows. Respondents were both city dwellers and visitors of the area. They were asked to name the first place that comes to their mind, when they recollect Colombo 07 area. Thirteen places were named as responses. Among them 'Viharamahadevi Park' was the place, which most people remembered.

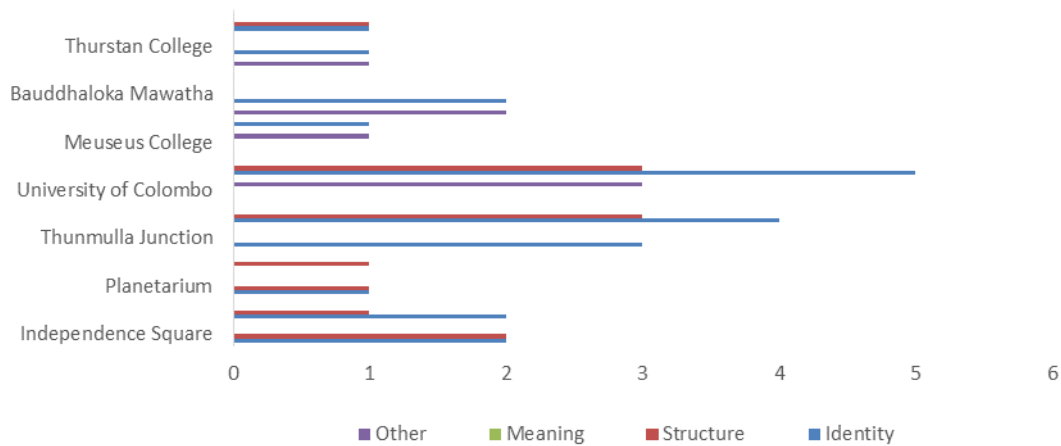




**Fig.6** - The first place which people reminds in Colombo 07 area

Then people were asked to give the reason to remember those places. It is identity, structure, meaning and other particular reasons. Responses as follows.

Among those thirteen places, 'Viharamahadevi park' was the highly memorable place according to graph below, because of its identity, and then 'NelumPokuna' Theatre was memorable because of its identity and structure. Next memorable place is 'Thunmulla Junction' also by its identity.



**Fig.7** - Reason for remember above places

Then people were asked five memorable places for a person in Colombo 07 area for identify the landscape elements and their qualities which contribute to enhance the Imageability and Legibility in the area. Responses were as follows.

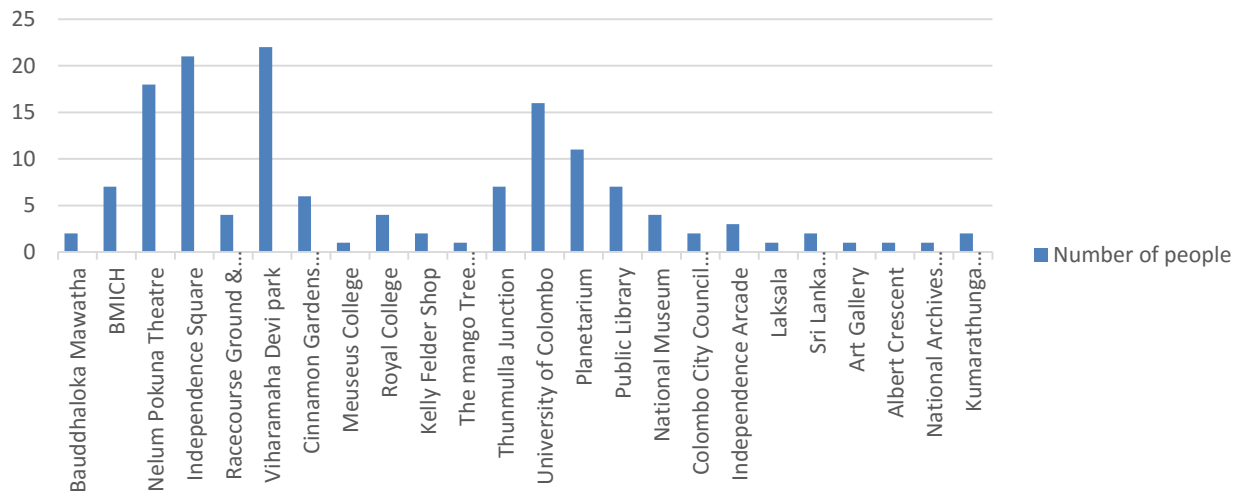


Fig. 8 - Highly memorable five places in Colombo 07 area

Based on the above data, twenty-four places were identified as imageable places in Colombo 07 area. They were analyzed separately according to landscape elements which are located in those places and their qualities of organization which helps to remember those landscape elements. According to that data 'Viharamahadevi Park' and the Independence Square are the most memorable places in Colombo 07 area.

**Place 01 - Viharamahadevi Park**

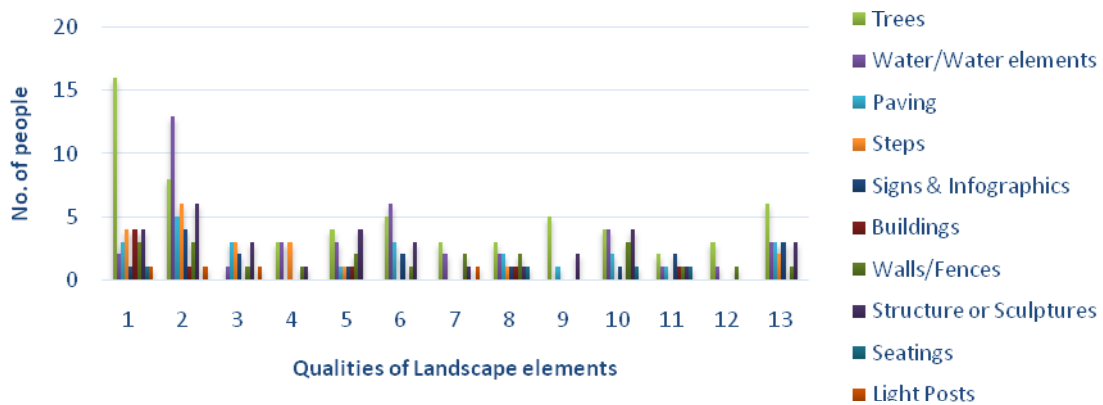


Fig. 9- landscape element analysis of Viharamahadevi Park

**Qualities of Landscape Elements** – 1. Number, 2. Position, 3. Direction, 4. Orientation, 5. Size, 6. Shape/form, 7. Interval, 8. Texture, 9. Density, 10. Colour, 11. Time, 12. Light, 13. Visual force

Based on the summary of the above data 'Viharamahadevi Park' is the highest memorable place in Colombo 07 area. When considering the mind maps, eleven people out of thirty people, marked 'Viharamahadevi Park' in their map. According to the landscape analysis of 'Viharamahadevi Park' (refer figure 9), these are the order of main qualities of organization in landscape elements which affect to the imageability and legibility of the 'Viharamahadevi park'.

## 1. Number of trees

'Viharamahadevi Park' is a huge public park locating among very complex, busy area. There are large number of trees located in the park. Ambiguity is existing with this greater number in this park. Because of this greater number of trees and the random locations of the trees, it shows complex pattern (informal pattern). With this repeated number of same element, visual relationship is very strong. So it looks like a small forest in urban area.

## 2. Position of water elements and trees

Position is very important quality of organization in landscape elements. In 'Viharamahadevi park' position of water elements and position of trees are main factors which affecting to Imageability and Legibility of the park. When we consider the water elements all of those water elements are positioned in horizontally. They are constructed in rigid form and it shows a formal quality. Elements in landscape shows visual relationships to each other through their similarities of position. (parallel, end-to-end or crossed). In here, this water ponds are located in end-to-end and in a crossed line, so they show a relationship to each other. When someone enter to the park, he can see horizontally positioned formal water elements.

Because of the visual relationship of those elements, they guide people into the park. And there is another water pond positioned isolated, so it is also highlighting as one and create special memory.

When consider the positions of trees in 'Viharamahadevi Park', most of them are located in random locations. So it shows a complex pattern. But in some places trees located in a line. So it creates a formal pattern. When consider a single tree; some tree stems are grow vertically, and then canopy grows horizontally or diagonally. Generally, these trees show vertical pattern. (ex: Coconut-*Cocos nucifera*, palm trees-*Arecaceae*, etc.) and also there are another trees stem and branches grows vertically and diagonally, and canopy spread horizontally. (ex: mara-*Samaneasaman*, *Delonix regia*, banyan trees-*Ficus benghalensis* etc.).

These trees show main three positions in combination and create a complex pattern. They show a relationship to each other, because of their similarities of position



Fig. 10 - Plan of Viharamahadevi Park



Fig. 11 - Position of water elements in Viharamahadevi Park



Fig. 12 - some trees are positioned in a line  
Source - Author

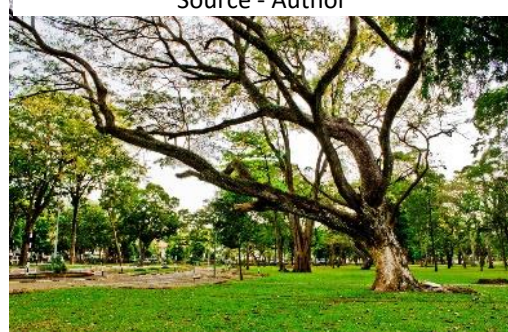


Fig. 13 - Most trees are positioned in random locations  
Source - Author

in landscape and it helps to create a strong image. Position of elements affect to maintain the harmonious balance of the landscape and it produce the strong visual image.

### 3. Shape/ form of water elements

Shape of element is a most important and powerful visual factor in identifying element. It is a preliminary factor in creating strong visual image. Shape is identifying with the variations of lines, planes and volumes. Form is a three-dimensional volume. Shape is the first identification of visual perception of elements. In 'Viharamahadevi Park', these are the main shapes of water elements.

First one is a natural shape and other two are man-made shapes. Natural shaped water pond looks informal and other straight and circle shaped pond looks formal. Many natural shaped elements are found in environment, but many geometric shaped elements are man-made. So these complexity of shapes of elements affect to create a strong visual image in mind.



Fig. 14 - Shape/ form of water elements in 'Viharamahadevi Park'

### 4. Visual force of trees

Position, shape and colour of elements are mostly affected qualities to the visual force of elements. Action of visual force can be contradictory or complementary in the environment. Meaning of the visual force is an illusion or sensation represent in static image. Shapes and lines which represent in landscape elements affect to visual force.

In 'Viharamahadevi Park' visual force of trees affect to Imageability and Legibility of the park. In a landscape we see, our eyes consciously or unconsciously identify and react to the visual force represented.



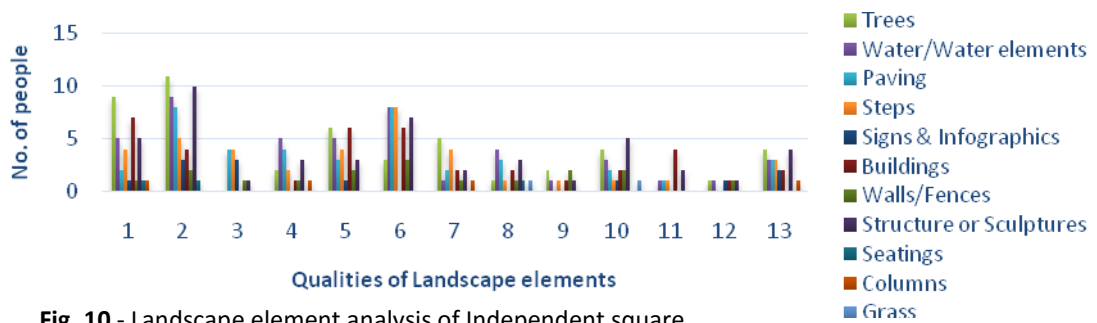
Fig.15 - Color of the trees creates visual force  
Source - Author



Fig. 16- Shape/ form of the trees creates visual force  
Source - Author

Based on the data analysis of 'Viharamahadevi Park' given above, 'Viharamahadevi park' is the most memorable place in Colombo 07 area. When consider the qualities of organization of landscape elements in this park, **Number, position, shape/form, visual force** are the most important qualities which help to build a strong image of the park in human mind.

**Place 02 - Independence Square**



**Fig. 10** - Landscape element analysis of Independent square

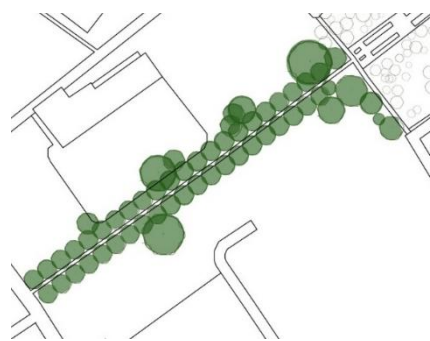
Based on the summary of the above data, 'Independence Square' is second highest memorable place in area. When considering mind maps, nine people out of thirty people, marked 'Independent Square' in their maps. According to landscape elements and their qualities analysis, followings are the main factors which affecting to 'Independence Square' be imageable and legible.

1. Position of trees and Structures and Sculptures

When consider position of trees in 'Independent Square', it shows two types of positions. In 'Independence memorial hall' area, most of trees are positioned in random locations. So it shows a complex pattern (informal pattern). In 'independence walk', all the trees are positioned in horizontal lines, in both sides of the pathway. They are parallel lines and it gives formal quality to the place.



**Fig. 17** - Randomly positioned trees near memorial hall



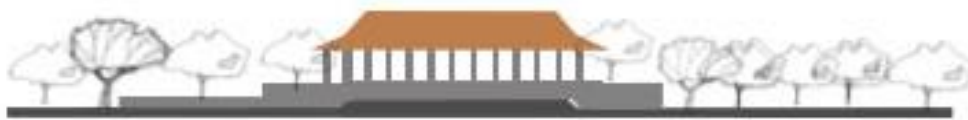
**Fig. 18** - Formally positioned trees in independence walk



The stem of all these trees are grown vertically (vertical position) and the generally all the trees have same heights. So canopy layer spread horizontally (horizontal position).



**Fig.19** - Formally positioned trees in independence walk



**Fig. 20** - Position of Independence memorial Hall

This contrasting vertical and horizontal positions of these trees are helps to create a strong visual image in the human mind.

Position of structures and sculptures are also affect to the Imageability and Legibility in this park. There are two main sculptures in this park. One is the statue of 'former Prime Minister D.S.Senanayake', and other one is the 'Independence Memorial Hall'. When consider the position of these two sculptures, they positioned in a special way. From the entrance it can be seen in one line and it looks like one element. So it gives the special quality to the park. The 'independence memorial hall' is an object building which stands in isolation. And also it is a landmark building. It located on an elevated platform in the center of the park, so everyone can clearly see it. It has many of vertical pillars and horizontal roof structure which is mostly highlighting. Those are the main features which affect to build strong image of the independence memorial hall.

## 2. Number of trees and Buildings

Number is another quality of organization of landscape elements which affect to Imageability and Legibility in the 'Independent square'. Number of trees are one of them. In 'Independence square' there are high number of trees so it also shows a complex pattern (informal pattern) in 'Independence Memorial hall' area. But in 'Independence walk' area, there are also huge number of trees, but according to their position it shows formal pattern.



**Fig. 21** - Number of trees and Buildings in Independence square

### 3. Shape/ form of water elements, paving and steps

In 'Independence square' these are the main shapes used for build water elements in this park.



Fig. 22 - Shapes of water elements in Independence square

Four rectangular water ponds positioned end-to-end and parallel form below shape. Shape of paving in the 'Independence square' is square. When they positioned in end-to-end it creates strong lines continuous along with paving. It is affect to create a strong visual image.

Steps in 'Independence square' is another important factor. There are different kinds of steps in 'Independent square'. Because of the differences of their shape, it creates a strong visual image in human mind.

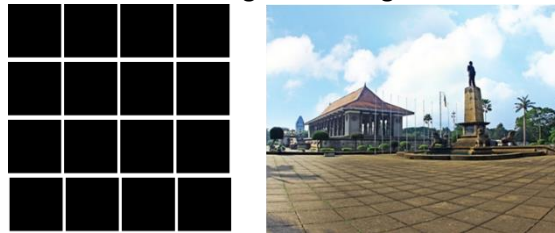


Fig. 23 - Paving pattern in Independence Square

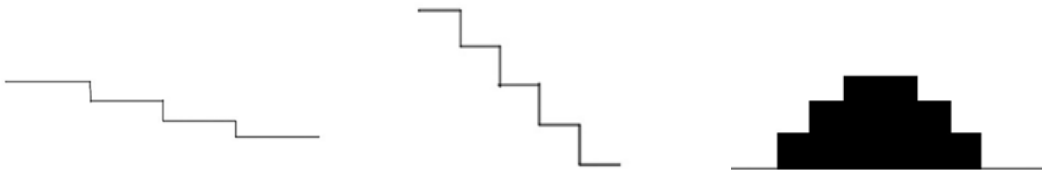


Fig. 24 - Shape/form of steps in Independence square

### Conclusion

Man always needs to be able to identify elements in urban environment to be feel "safe" and "secure". A clear mental map of the urban environment always helpful for reduce the "fear of disorientation" or the "fear of being lost". So the imageability and legibility of the elements in the environment are very important in their way-finding process. Legible and imageable environments give more clarity and coherence to the space. It leads and guide people within the urban setting without getting lost. If the environment is not imageable and legible, it becomes a confusing for users and people should have face to a chaotic experience.

Visual landscape perception is always bound with the imageability. People observe what they see, evaluate it and create a mental image. It is a fundamental need of a person which leads a person to psychological satisfaction. The image of a city depends on the elements and components in the city and the organization of them. Well organized elements always strengthen the image. It helps to create its own character to the city and create a strong image in the human mind. In that case landscape is bounded with the space in urban environment and make better communication between environment and users. Landscape always helps to create an identity and own character to the space. Elements in the landscape organize in different ways in the urban environment and create a successful living environment, and also pleasant, coherent, imageable environment to users. Therefore, it is very important to create image

making elements in urban environments. The intention of the study is to identify how landscape elements and their qualities of organization have helped to strengthen the imageability and legibility of an urban environment.

This study was done to identify image making elements and their qualities of organization in Sri Lankan urban environments, with special reference to Colombo 07 area. Based on the summary of the data gathered by questionnaire survey, there are two highly imageable places in the area which are 'Viharamahadevi Park' and 'Independence square'. According to the above data, 'Viharamahadevi Park' is the highest memorable place in Colombo 07 area. Based on the data analysis; **number, position, shape/form and the visual force** are the major qualities of organization in landscape elements which enhance the imageability and legibility of the 'Viharamahadevi park'. Then the second highest memorable place is 'Independence Square'. Based on the summary of the data; **position, number, shape/form and the size** are the major qualities of organization in landscape elements which enhance the imageability and the legibility of 'Independence Square'. So according to that analysis those qualities of landscape elements are the most affected factors to enhance the imageability and Legibility of those parks which located in highly urbanized area. Within this urbanization this area is developing rapidly. So this development should be done with conserving or enhancing the existing image of the city. For that, identification of image making elements are very important.

When considering the level of imageability and legibility of an urban environment, it is a most important quality for users in their way finding process. In current situation, cities are rapidly urbanizing and developing according to the current needs of inhabitants of these cities. So establishing imageability and legibility or maintaining current image of the urban environments is becoming a main requirement in designing, planning or rebuilding process. Physical elements in the environment always help to build the character of the environment and it helps to establish imageability and the legibility. According to my research, Landscape elements and their qualities of organization in urban environments contribute to the image making process of the urban environment. So in the above process of refurbishment and redesigning urban areas, this study could be used very effectively to design urban landscape to create more livable and functional cities for people.

## Bibliography

- Appleyard, D. (1976). *Planning a pluralistic city*. England: The MIT press.
- Banz, G. (1970). *Elements of urban form*. McGraw hill co.
- Bell, S. (2004). *Elements of Visual Design in the Landscape*. (Second, Ed.) London: Spon Press.
- Bentley I, Alcock A, Murrain P, McGlynn S, Smith G. (1985). *Responsive environments*. Cornwall: MPG Books Ltd.
- Berleant, A. (1977). *Living in a landscape; Towards anesthetics of environment*. Lawrence, Kansas: Kansas University press.
- Boulding, K.E. (1956). *The image*. University of Michigan press.
- Burke, G. (1976). *Townscape*. London: Buttler and Tunner Ltd.
- Ching, F. D. (1996). *Architectue form, space & order*. Inc: John wiley & sons.
- Christopher, A. (1977). *A pattern language. Towns, Buildings, Constructions*. New York: Oxford University press.
- Corra, C. (1926). *The new landscape*. Bombay: Tata press.
- De.Silva, K. (2011). Mapping meaning in the city image: a case study of Kandy, Sri Lanka. *Journal of Architectural and Planning Research*, 28(03), 229-251.
- Dolors, H. (1995). *The power of place*. Cambridge: The MIT press.
- Garrett, E. (1950). *Landscape for living*. USA: F.W.Dorge corporation.
- Gorden, C. (1961). *Townscape*. New York: Reinhold publishing co.



- Grove A.B, Cresswell R.W. (1983). *City landscape*. Butterworths.
- Herath, H. (2007). *Examination of the role of landscape in enhancing the legibility of the urban space*.
- Jellico G, Waymark J, Jellico S. (1995). *The landscape of man*. Thames and Hudson Ltd.
- Jellico, G. (1991). *Designing the new Landscape*. London: Themes and Hudson Ltd.
- Kaplan, R. K. (1998). *With People in Mind*. USA: Island Press.
- Lynch, K. (1960). *The image of the city*. london: The MIT press.
- Lynch, K. (1972). *What time is this place*. England: The MIT press.
- Lynch, K. (1981). *The good city form*. England: The MIT press.
- Lynch, K. (1990). *City sense and city*. london: The MIT press.
- Opanayake, J. (1998). *Landmarks in urban landscape - a study of their contribution for imageability of places and legibility of an urban environment*. not published.
- Ozyavuz, M. (2012). *Landscape Planning*. In Tech.
- Rapoport, A. (1977). *Human aspects of urban form*. New York: Pergemon press.
- Rapoport, A. (1977). *Human Aspects of Urban Form*. Oxford: Pergamon press.
- Rapoport, A. (1982). *The mainning of the built environment - A non verbal communication approach*. London: Sage publication.
- Tom, T. (1996). *City & landscape*. London: Spons.