FACTORS INFLUENCING THE EFFECTIVENESS OF HUMAN BEHAVIOR IN DESIGNED LANDSCAPES: TWO CASE STUDIES IN SRI LANKA

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Abstract

Urban recreational spaces are meant for people to gather, relax, refresh and improve their interaction, thus should be designed consciously and sensitively to have a positive impact on a person's cognition. The indicator of this impact will be the corresponding behaviour of users. A Landscape Architect is expected to influence the user's movements and behaviour in creating a desired responsive atmosphere, not only by just designing pathways or furniture arrangements, but also by facilitating user's movements and behaviour patterns associated with them. Several recreational landscape design interventions have emerged in urban areas of Sri Lanka during the recent past which seems to function well. However, whether these spaces really fulfil the above behavioural need is worth investigating.

*This paper intends to explore five significant factors which influence effective human behaviour in urban public spaces applicable to recreational landscape designs namely; variety, safety, convertibility, scale and permeability as commonly identified by the eminent scholars; Alexander 1977,Rapoport1977,Bentley et al, 1985and Gehl, 2010. Leading to an investigation on factors unique to Sri Lankan context, a c*ase *study survey was implemented in Diyatha Uyana, Baththramulla (n=30) and Urban wetland park, Nugagoda(n=30) with the use of questionnaires, behavioural mapping, observations and then analysed with spatial syntax software.*

Design following behaviour as well as design against behaviour was observed in both cases. Diyatha Uyana was ranked comparatively high with reference to all the factors tested dominated by variety over Urban Wetland Park. Lack of convertibility, sense of scale, safety and sensitivity to the psychophysiological and behavioural requirements of human beings related to recreation were found to be the weak points inducing design against behaviour of the users and needs careful attention in future recreational landscape design interventions.

Keywords: Human behaviour, Designed landscapes, Recreation, Urban public spaces, Effectiveness, Diyatha uyana, Wetland Park

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1. Introduction

Landscapes having a human intervention are identified as designed landscapes. Such interventions are executed to create better surroundings which are more comfortable, attractive and desirable for people, making them happy while fulfilling their social, cultural, environmental and psychophysiological needs. The responsibility of a landscape architect is to optimally plan, design and manage open spaces including both natural and built environment. The objective of landscape architecture would be to investigate existing ecological, social and cultural conditions in order to achieve environmental, behavioural or aesthetic outcomes. Behavioural outcomes which landscape architects try to achieve are very important assure behaviour is the representative of ultimate meanings, ideas and expressions that the user perceive from a landscape design intervention. Human behaviour is defined as a result of human perception and cognition which change from person to person and situation to situation according to their needs, preferences and attitude. Urban recreational landscape designs are created with the intention that the users would obtain the maximum benefit out of them. Recreation is a state of mind related with pleasure. It differs from person to person according to individual perception. It can be passive or active and supports people to be more relaxed while improving the interconnections among them.

Urban public spaces are meant for people. They are in their neighbourhood where people can meet and talk, rest, eat, interact and walk comfortably in public. These public spaces are connected with other buildings, structures, shops and private spaces of the city. They also act as cultural assets which depict human activities and behaviours of that society. An effective urban landscape design accomplishes the anticipated purpose of providing best opportunities for the urban dwellers to release all the stresses, refresh, relax, talk, walk , gather, interact with each other and spend their leisure time meaningfully and fruitfully. But, the urban landscape design interventions in Sri Lankan context don't seem to be utilized maximally by the end users, which is the prime concern of the current investigation.

Due to improper utilisation and appreciation of space, the urban open spaces are disparaged, directly affecting the "spatial profitability". A designed landscape, used ineffectively and inefficiently by people, having less contribution to their wellbeing is low in spatial profitability. Accordingly, the cost of such a landscape design intervention goes in vein. The purpose of an urban recreational space in general terms is to provide ample opportunity for the users to utilise their leisure time optimally. Designers imagine and create such space and their relationships anticipating that the perception of such spaces may lead to relaxed, joyous feelings/emotions leading to corresponding relaxed behaviour. However, the users might either behave following the design or behave in a completely different way than expected based on the responsiveness of the design. For instance the users might behave in a very formal manner and try to escape as soon as they fulfil their needs in a space designed for relaxation. People's appreciation of space can be recognized by the manner in which they feel, perceive, behave and utilize such spaces. The way we experience and construe the regions of our own bodies, elements of these constructs can be articulated so as to inform the way we interact and engage with the space around us (Thompson, 1997). If people don't interact and engage with the space around them, it can be probably because of lacking favourable factors of design.

Do Sri Lankans utilize urban recreational spaces maximally? Do they behave as per the expectations of the designer? In view of this, the current investigation focuses on the effectiveness of recently emerged urban recreational landscapes in Sri Lanka with reference to fulfilling the designer's intentions as well as diverse user needs related to recreation. It was attempted to identify the factors affecting effective human behaviour within recreational landscape designs and to discuss as to how these factors support in creating friendly and effective landscape designs which are appreciated by the user.

Fig 1: Diyatha uyana
Source; Author

2. Theoretical Background of the study

Bentley et al (1985) presented seven factors which should be considered when designing responsive places namely; permeability, variety, legibility, robustness, visual appropriateness, richness and personalization. Rappaport (1977), while citing the initial discussions of Acking & Kuller (1973) and Wiggins (1973), has presented twelve components which should be incorporated in a good landscape design. They are, degree of enclosure, size of space, character of space, nature of enclosing elements, amount of greenery, activity, function, pleasantness, complexity/ originality/ interest/ surprisingness, unity, enclosure and affection related to the old and genuine.

Gehl (2010)identifies comfort and delight, feeling safe, protection (against traffic and accidents, crime and violence, unpleasant sensory experiences),opportunity (to walk, stand/ stay, sit, see, talk, listen, play, exercise enjoy the positive aspects of climate and positive sensory experience) and scale as significant factors to be incorporated in effective public spaces.

Alexander (1977) discussed on patterns related to public spaces under several categories explicitly; outdoor spaces, green spaces, children, old people, water, streets, paths etc.

As per the above explanations proposed by several scholars, there are numerous factors affecting the human behaviour in urban public spaces which influence human cognition, enlightening users to decide as to how they should walk, gather, sit and behave within such spaces. The current study, after analysing the above factors, zoomed in to five most commonly cited factors to be investigated further.

2.1 Theoretical framework

This framework highlights five parameters of human behaviour in urban public spaces to be elaborated in the current investigation.

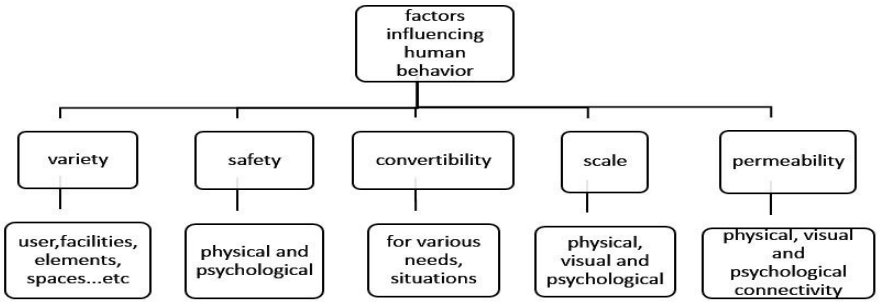


Fig 2: Theoretical framework

2.1.1 Variety: The beauty of the universe consists not only of unity in variety, but also of variety in unity (Eco, 1980). Variety gives choices for people. As too many choices can be boring, but in every public space there should be variety to some extent. Both functions and spaces should have variety to suite human needs and improve the opportunities to feel and enjoy that whole space(Bentley et al 1985,Gehl2010).

2.1.2 Safety: Safety is one of the primary psychological needs of human beings. In urban public spaces, people are always conscious and concerned about safety as a vital factor. People always try to escape from calamity, crime situations, violence and unpleasant sensory experiences(Gehl, 2010). As the ability to see without being seen is an intermediate step in the satisfaction of many of those needs, the capacity of an environment to ensure the achievement of this becomes a more immediate source of aesthetic satisfaction (Appleton, 1975).

2.1.3 Convertibility: Convertibility or robustness of spaces is recognized as a major need in community spaces (Bentley et al, 1985). Initially, people thought that humans should get adapted as per the spaces. They designed rigid, formal spaces which are fixed. Yet, later on people realized that spaces need to be adapted to suit the human needs. This quality of spaces adapting for human need is called convertibility. Places which can be used for many different purposes offer their users more choice than places whose design limits them to a single fixed use (Bentley et al, 1985).

2.1.4 Scale: Scale is a decisive factor in an effective public space (Rappaport 1977,Gehl2010).In its simplest definition, creating a human scale environment means making sure that the places humans interact every day are of a size and shape that is reasonable for an average person to use. For instance, stairs have a 7 inch rise and an 11 inch run while the doorways are generally 80 inches. Spaces designed as per the human scale enable humans to live with comfort physically and psychologically. On the other hand, human beings are not made to live within a static setting with fixed measurements. They are made by nature to live freely without fixed boundaries. With their complex lives people are used to live with fixed boundaries and measurements. Relaxation is a basic need of humans which require them to be free without any limitations. Scale of the designed spaces with reference to human's physical and psychological needs is an important factor when designing public gathering spaces which are meant for relaxation. Sometimes anthropometric space is not enough for the users to get expected results. They need more space than anthropometrically estimated space for their entertainment,

relaxation and refreshment. If the designer is not keen on this scale factor, design can become boring for the users because they can't draw expected results out of that space.

2.1.5 Permeability: Only places which are accessible to people can offer them choice. The extent to which an environment allows people a choice of access through it, from place to place, is therefore a key measure of its responsiveness and effectiveness. This quality is identified as permeability (Bentley et al, 1985).Permeability can be physical, psychological or visual. Sometimes, even if there is no physical accessibility people may still be satisfied with visual accesses provided. Accordingly, visual vistas and physically interconnected spaces can influence on people's attachment to a space.

3. Methodology

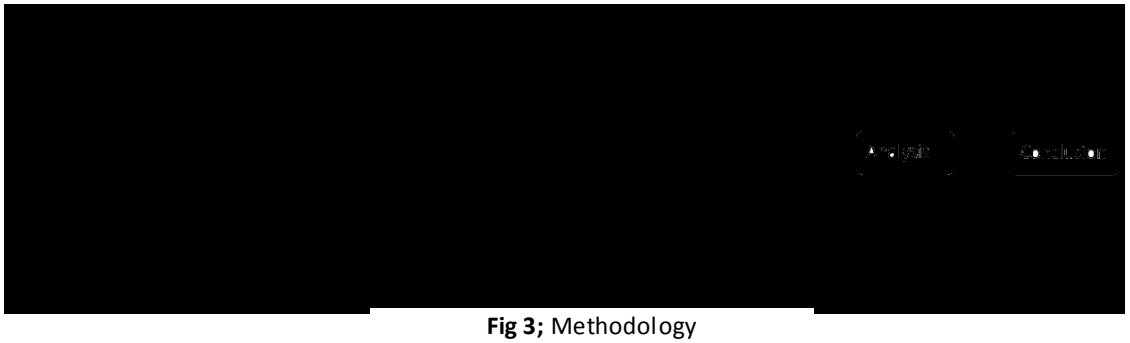


Fig 3; Methodology

The study adopted a mixed method which is twofold, namely a literature survey and a case study. A literature survey was carried out to identify theories and arguments related to the subject area. The factors which contribute to effective urban public spaces recommended by different scholars which are applicable to urban recreational landscape designs were analysed to identify the significantly common factors to investigate further. A structured questionnaire was designed based on the selected five parameters of the study; variety, safety, convertibility, scale, permeability.

Two cases representing recently emerged urban recreation landscape interventions in the city of Colombo namely; Diyatha Uyana, Baththaramulla and Wetland Park, Nugegoda were selected to test the above five factors identified.

Diyatha uyana: Diyatha uyana is a park situated in Baththaramulla, Sri Lanka which was created on a marshy land between the Parliament complex and the Diyawanna Oya at Polduwa junction. This recreational park was introducedto enhance the beauty of the city of Sri Jayewardenepura, Kotte during the post war period and it is mostly functioning during the weekends, significantly during night time. This park is comprised with a dining area, shopping area, an aquarium, jogging tracks, bird watching area and seating areas for resting along with the water front and lush greenery.

Urban Wetland Park: Urban Wetland Park is another landscape intervention introduceddurin the post war period down Nawala road, Nugegoda as a soothing area for recreation amidst a bustling city. This parkconsists of cycling and jogging paths, fountains, seating areas and

manmade water features designed with various lighting effects. Curvilinear walkways which are running around water features are significant here.

Observation, mapping and questionnaires were incorporated as data collection tools. A random sample of 30research participants was selected per each case study to conduct the questionnaire survey. Behavioural maps were derived via observing the behavioural patterns of the users of each case and computer generated images were used to present these observations.

These behavioural maps were created by observing the spot behaviours of people from 3.00pm to 4.00pm on a Sunday. It was attempted to differentiate between design following behaviour and design against behaviour in this regard. Creating activity maps and then deriving them to behavioural maps was done. In those maps design against and design following behaviours of sitting and walking were marked. Computer aided drawings were generated by author to further explain on observed behaviours. Space syntax theory was adopted to measure the two parameters; permeability and safety. All the results were analysed to come up with conclusions and recommendations.

4. Limitations

These recreational spaces are mostly functioning at night time, but the study was limited only to day time observations. Only human behaviour was used to measure effectiveness of the design out of many aspects. Even if there are number of methodologies which can be used to conduct this study only questionnaires, behavioral maps and space syntax software were adapted.

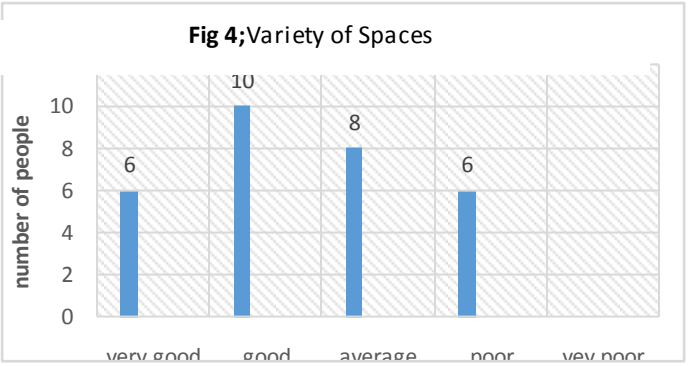
5. Data presentation and analysis

5.1 Diyatha Uyana

5.1.1 Variety in Diyatha Uyana

- Variety of spaces

Fig 4;Variety of Spaces



Variety is achieved mainly by the views and the activities provided. Variation of spaces are found to be less as the design of outdoor furniture, paving and trees are not changing much throughout the design.53% of the participants responded positively on variety of spaces.

- Variety of facilities

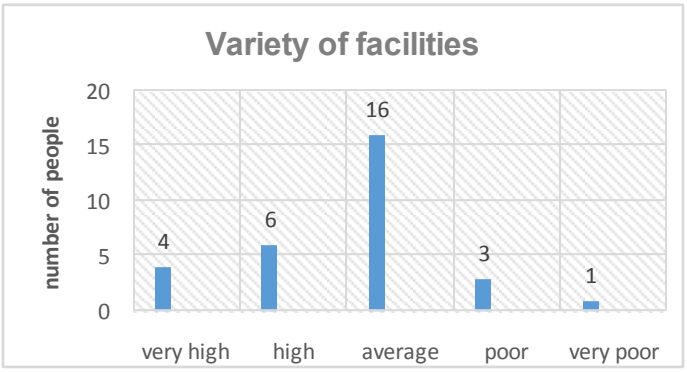


Fig 5;Variety of Facilities

Facilities like dining, conversing, exercising and walking are provided. Sanitary facilities and road with 3D paintings are not functioning properly due to the maintenance issues. Only 33% subjects responded positively on the variety of facilities. A majority of 53% rated as average while the rest were not satisfied (13%).

- Variety of Visual Experience

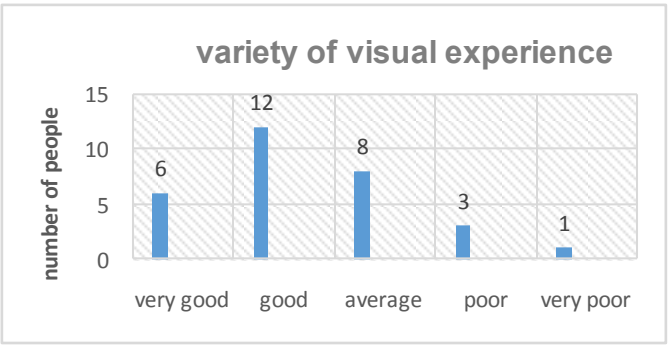


Fig 6; variety of visual experience

This found to vary yet not to a greater extent due to the similarity of outdoor furniture, trees and paving's. View is changing from a busy setting to calm scenery and that variation gives pleasantness to the eye.60% of the participants were identified to respond positively on the variety provided in visual experience.

5.1.2 Safety in Diyatha Uyana

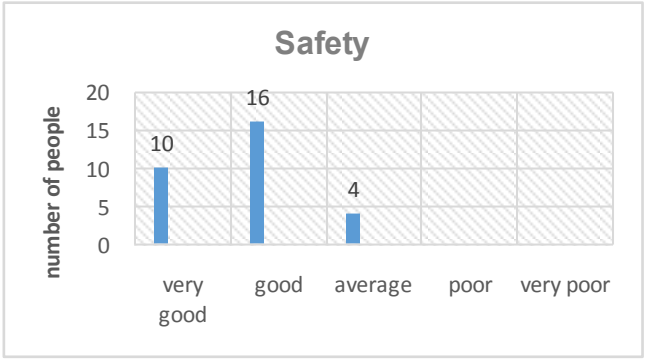


Fig 7;Safety

The rating for the safety was found to be very positive (86.6%). This park is connected to the main road from only one side which is the busiest area while the other boundaries are mostly surrounded by water. Having water as a protective element it is supposed to give the idea of safety to some extent. However, the safety from water is not given by the design and security guards are always keeping an eye on the users significantly closer to the water front.

5.1.3 Convertibility in Diyatha Uyana

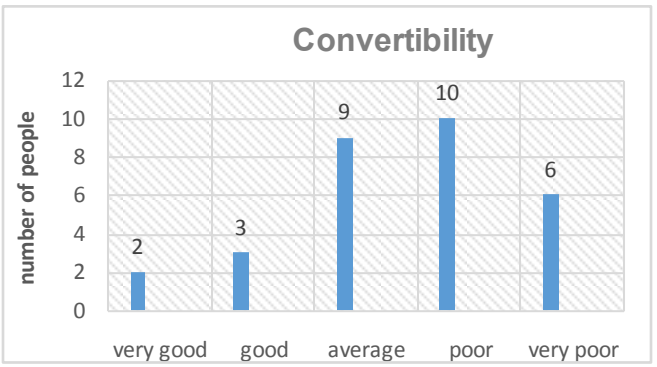


Fig 8;Convertibility

Convertibility of space is rated mostly as poor (16.6%) and average (10%) in this park. There are multi-functional spaces like the road with 3D paintings which can be used for walking, taking photographs and skate boarding. Most of the spaces are less convertible due to the use of outdoor furniture setting which are not flexible, designed as cubes, fixed to the ground. Sometimes design against behaviours of seating is happening due to this less convertible factor of furniture setting. Also the convertibility factor of spaces is getting low due to the rules and regulations given within the park.

5.1.4 Scale in Diyatha Uyana

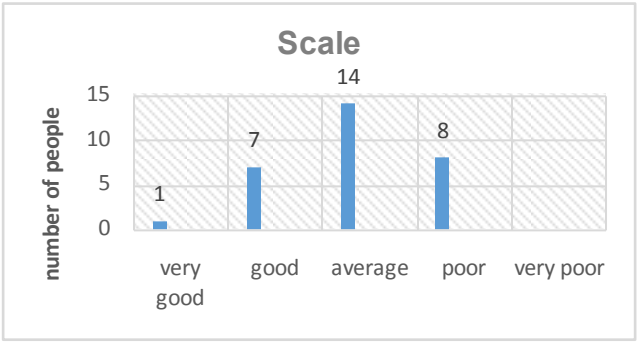


Fig9;Scale

Scale is mostly rated as average (46.6%). It indicates the participant's perception that some parts of the park has been designed responding to the human physical and psychological scale while some spaces are not designed accordingly.

5.1.5 Permeability in Diyatha Uyana

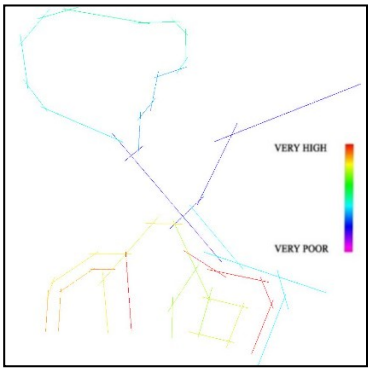


Fig 10; Map derived from space syntax software

According to the space syntax theory, entrance area of Diyatha uyana, comprising the dining facilities, aquarium and water fountain is the space which has the connectivity factor to the most. It is the area becoming dense with people mostly during lunch and dinner times. People visit this area also to buy ornaments and flowering plants. Jogging track area is mostly functioning during the evening. But sometimes animal watching area, road with 3D paintings and timber deck is becoming isolated. Lack of permeability can be a reason for that matter.

5.1.6 Human Behaviour in Diyatha Uyana

Fig 11; Behavioral maps of Diyathauyana: Design following behavior vs Design against behavior

according to observations

Design following behaviour: In Diyatha Uyana, there are seating areas, jogging tracks, dining spaces, aquarium and water features to facilitate the recreational activities of people. Most of them are designed with respect to human anthropometrics. As examples:

1. Seating spaces in Diyatha Uyana are made with the measurements of 45cmx45cm x 45cm.
   (45cm is the anthropometrically comfortable seating height and width of a person)
2. Pedestrian walkway is designed with proportions for two people to pass at a time. (these pedestrian walkway is 1.5m in width)

According to the gathered data, most people are behaving as suggested by the given design. As examples:

1. Sitting in designed seating spaces with the exact posture and behaviour as expected by the designer.

Fig 12; Seating spaces at Diyathauyana
Source; Author

Seating spaces offer facilities for a set of four people. One of the reasons for this design following behaviour could be that there are no more than four people in a group or the visitors have come unaccompanied. Also sometimes if there is large number of people in the group (8 or 12) it is possible that they sit as two-three groups in adjoining seating spaces. However less variety, less convertibility and the scale has given rise to this behaviour because these seating spaces are very rigid and ability to convert them according to people's diverse needs is hard to achieve. Accordingly, people act in a very formal manner as suggested by the given seating arrangement.

Fig 13; Expected seating behavior
Source: Author

2. Walking on the pedestrian walkway one after another.

One of the reasons for this design following behaviour is that the given width and defined boundaries of the walkway forces people to walk one after one. People who came alone to the park can easily maintain this behaviour. However, most of the groups having much number of visitors find it difficult to follow this behaviour. Instead of walking on the pedestrian walkway, they walk on the road with 3D paintings.

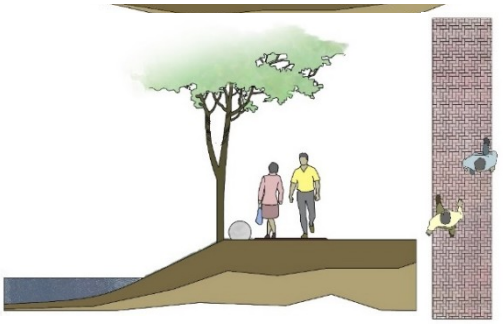


Fig14; Expected walking behavior

During the daytime, shade of the roadside trees is becoming a strong reason for the people to walk on the walkway. Accordingly, the visitors follow the defined behaviour for the reason that walking under the shade of trees is more comfortable at that time. Design following behavior of jogging track is mostly achieved by the material usage. Use of sand enhances the feeling of jogging to a greater extent. This track at certain points is multipurpose, used for walking and animal watching as well.

Design against behaviors

Seating spaces of Diyatha Uyana, being designed restricting only for four people to sit together at once, was found to encourage people to behave against design expectations. The desire of a set of friends, who visit the park to dine or to have a conversation, would not be to sit formally and/or separately in the provided seating area. Such large groups were found to behave against design expectations. Had there being convertibility in terms of furniture arrangement in order for them to alter the space freely and fulfil their needs it would have been be more comfortable & relaxing for the users.

Fig15; Seating behavior against design

Less convertibility of space was observed as a reason which leads people to sit on the turfed areas on river banks for conversations. This indeed has become a concern of the administration of the park due to the low safety factor associated with the river bank. As a consequence, security guards are preventing people from this behaviour. Had there been variety and convertibility of seating arrangements this issue wouldn't have occurred.

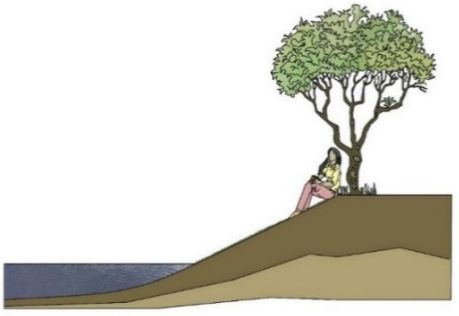


Fig 16; Sitting on river bank

Walkway along one side of the road with 3D paintings is designed for two people to pass through at a time. It was observed that when couples or group of friends come to the park they don't follow that given pattern as they desire to walk parallel to each other while conversing. This makes a design against behaviour. Scale factor is highly affecting in this case. This is due to absence of correlation of psychological measures against anthropometrics. Lack of careful consideration on parameters of convertibility, variety, scale and safety have affected on design against behaviors in Diyatha uyana.

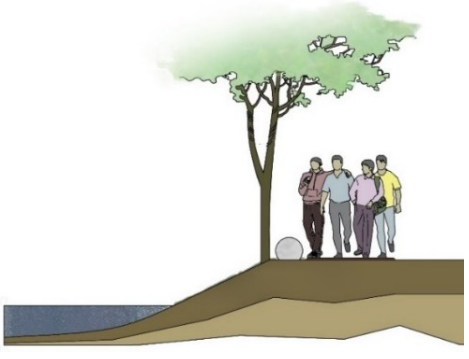


Fig 17;Walking behavior

5.2 Urban Wetland Park, Nugegoda

5.2.1 Variety in Wetland Park

- **Variety of spaces**

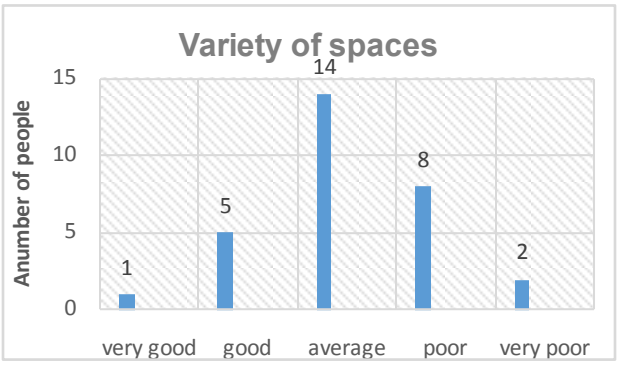


Fig18:Variety of spaces

The results of the questionnaire survey were mostly rated as average (46.6%) or poor (33.3%).

Area with built water features with lighting effects, pathways and area with jogging track are the distinct spatial components in this park. The design of pathways is monotonous leading to monotonous behaviour of people. Jogging track which is running through the wetland in approximately 5m width continuously is another aspect leading to monotony.

- Variety of facilities

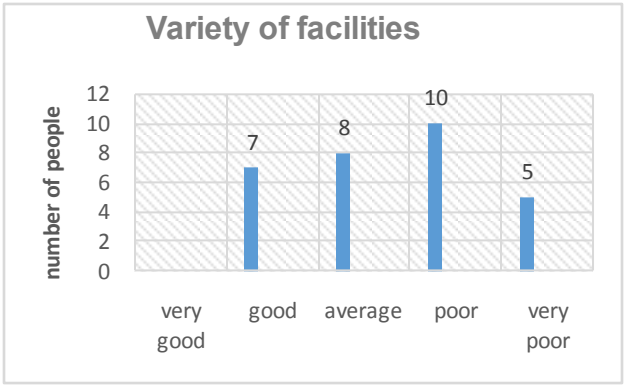


Fig 19;variety of facilities

Variety of facilities has been mostly rated as poor (50%) or average (26.5%).Facilities provided for dining is located in a corner of the park. Low shade makes people uncomfortable to enjoy facilities provided during the day time.

- Variety of visual experience

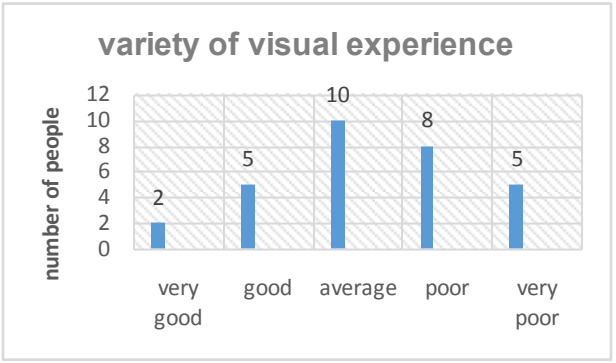


Fig 20;variety of visual experience

Variety of visual experience also has been rated as average (33.3%) and poor (43.3%) supposedly due to the monotony in the use of materials, pathways, trees and other facilities like seating.

4.2.2 Safety in Wetland Park

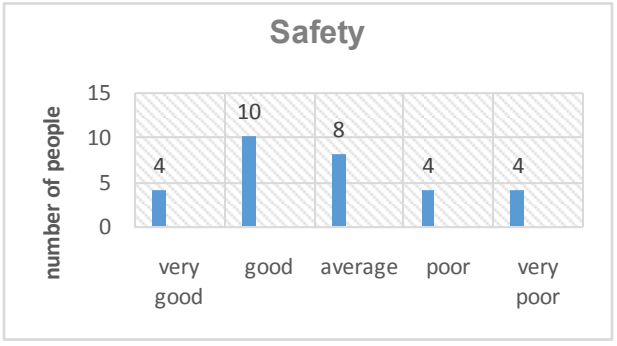


Fig21;safety

Most Participants indicated that the safety of the park is average (26.6%) or good (46.6 %). Another 26.6% rated safety as poor. The park is located in a busy and dense area where the safety provided by security guards is comparatively low. During the daytime the jogging track area is isolated to some extent. Yet, during the evening it functions with people who are coming for jogging and exercising after office hours. However, because of that isolating quality, people are not walking unaccompanied along the jogging track even to use the dining facilities provided in one corner of the track.

4.2.3 Convertibility in Wetland Park

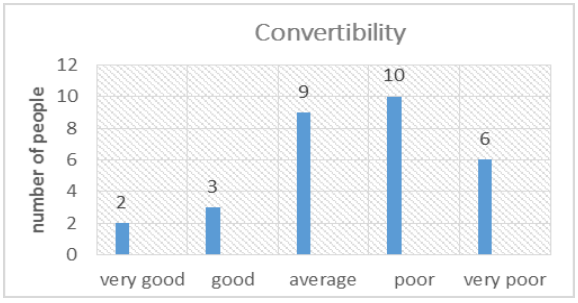


Fig 22; convertibility

Convertibility factor is rated mostly as poor (60%) by the participants. This park is an all set design which is fixed and not flexible. Users can't convert the furniture or spaces to suit their needs or situations.

4.2.4 Scale in Wetland Park

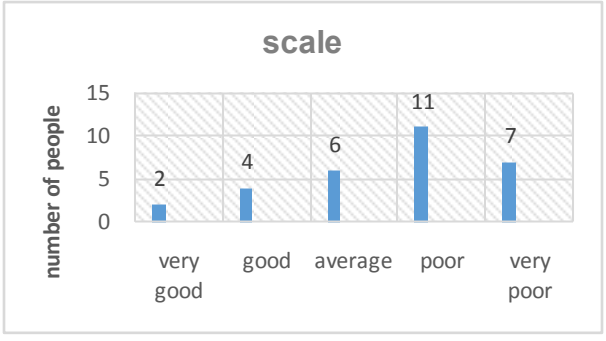


Fig 23; Scale

Scale factor also has been rated as poor by most of the participants (60%).Spaces of the design were found to be poor in variation of scale. Width of pathways are not changing much and found to be low when comparing to the physical and psychological needs of users.

4.2.5 Permeability in Wetland Park

Results of space syntax software indicate a difference in connectivity levels of different areas of the park. Entrance area with a small land extent which has water features and pathways with

seating facilities is indicated as having a good connectivity compared to other areas. Area along the jogging track is identified to have less connectivity leading to its isolated nature. It was also indicated that the area which has good connectivity is less comprehensible and little complex due to the manner as to how certain materials, pathways which are curvilinear and seating facilities have been provided.

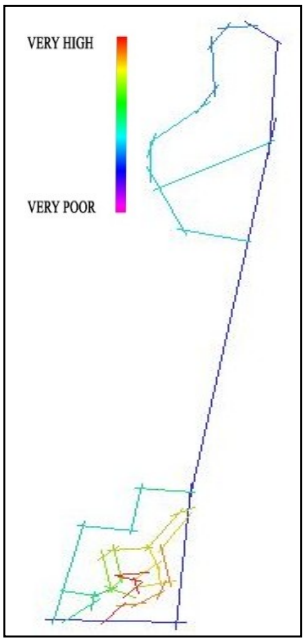


Fig 24; Map derived from space syntax software

4.2.6 Human behaviours in Wetland Park according to observations

The main design components of the Wetland Park are walkways, water features, jogging track and seating spaces. Both design following and design against behaviors have been observed.

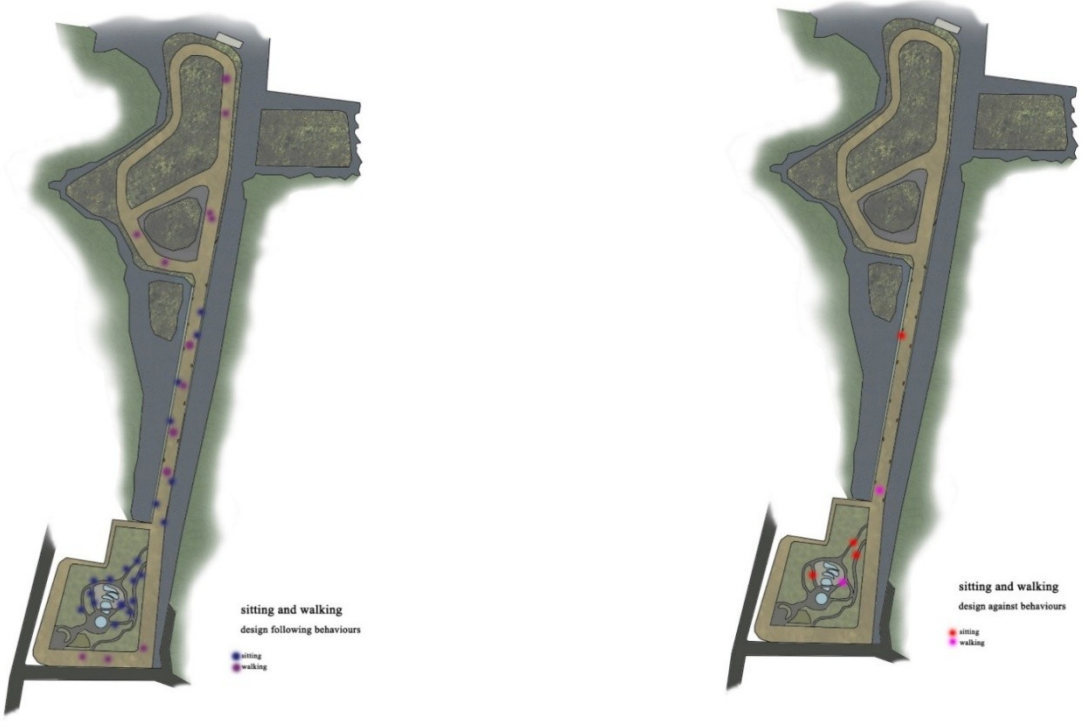


Fig25;Behavioral maps of Wetland Park: Design following behavior vs Design against behavior

Design following behavior: Some seating spaces are on the sides of walkways maintaining anthropometrical seating measures (45cmx45cmx45cm). People follow the design by sitting on these seating spaces. The reason for this behavior can be the shade available in this area. The walkways are curvilinear in shape and maintains privacy to some extent due to low level in visual permeability. It was able to observe young couples sitting on these seating and noticeably both partners were sitting on the same side of the walkway having intimate conversation. At some instances there were groups supposedly families or friends sitting on opposite sides of seating facing each other facilitating their desired nature of communication.

Fig 27; Seating behavior
Source: Author

Curvilinear walkways are maintaining a width of 1.5 m and paved with granite stone plates. When people are seated on both sides of the walkway, the remaining space in-between is sufficient for only one person to walk comfortably. There are people who follow the design by walking on these walkways. But sometimes it was observed that they are forced to walk through those people who are seated on either side as the scale of that walkway doesn't match with human's psychologically comfortable individual space.

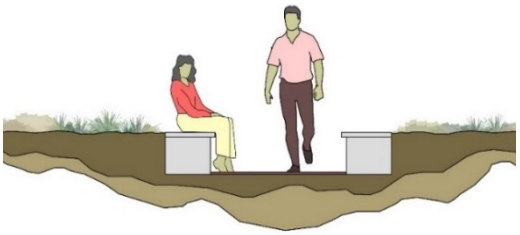


Fig 28; Seating and walking behavior

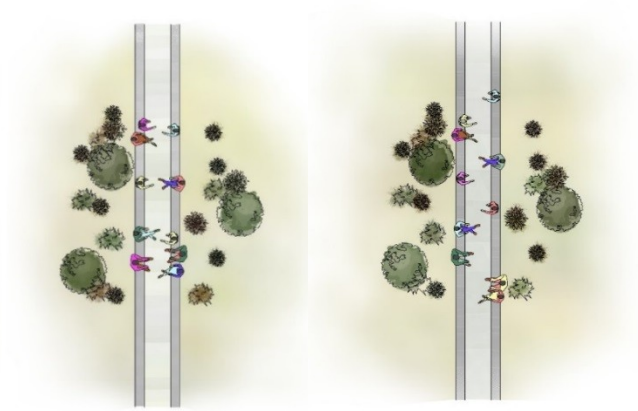


Fig 29; Expected and present seating behaviors

Design against behavior: Along the sides of walkways, the designer has introduced continuous built in seating expecting that people will continuously sit on both sides of these seating spaces.

Fig 30; Expected walking and seating behavior

However, it was observed that strangers don't tend to sit on opposite sides of this walkway since it is too narrow. Psychologically people are uncomfortable when unknown people are sitting in front of them so closely. Scale accounts for this behavior. Had this in-between space of seating spaces been much larger, the expected behavior of designer could have been achieved.

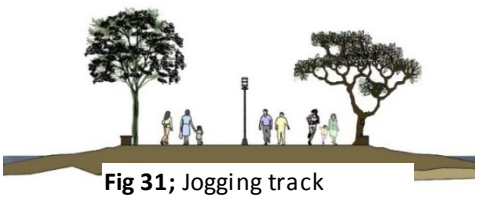


Fig 31; Jogging track

Designer's conjecture is that visitors will easily walk through the people who are sitting on the seating spaces without any difficulty. However, walking through people who are seated was found not to generate a pleasant, free feeling and relaxing experience.

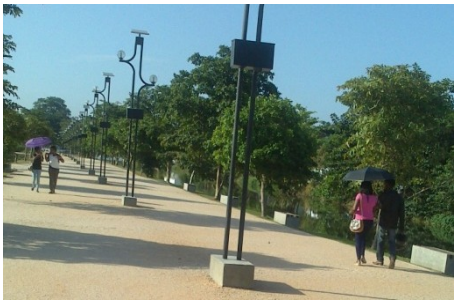


Fig 32; Light posts as a space dividing element
Source: Author

4m wide jogging track is paved with sand, which is also used for cycling. The light postsdivide jogging track into two lanes. The designer would have expected that people might use one side to enter the track and other side to exit. Most of the people who use the jogging track for exercises are coming after 4p.m. Some of them use one side of the track to enter and other side to exit. However, some people don't pay attention on the side of entry or exit as it is not proposed by the design effectively.

The benches made from timber and steel are located on either sides of the track and all seating spaces are rigid and fixed to the ground. They are designed only for two people to sit at one time. As a consequence some people prefer to sit on the ground instead of sitting on benches. Rigidness and less convertibility of seating spaces may be the cause for this behavior. A line of trees is introduced to provide shade for these seating. However, the canopy widths of some of the trees are not sufficient to supply the required shade during the day time. Jogging track area is observed to be isolated during the day time due to less permeability and safety.

Lack of careful consideration on all the five parameters studied; variety, convertibility, scale, safety and permeability have affected on design against behaviors in Wetland Park, Nugegoda.

5. Conclusion

Based on the strengths and weaknesses of the given design solution, a landscape architectural intervention can be either ruling the users by force or allowing them to behave naturally, fulfilling their corresponding needs in desired satisfactory levels associated with the function. Recreational landscape designs act a major role in this matter as they are meant not to force on people by giving rigid guidelines to follow. This study was initiated with the objective of finding the factors which influence the effectiveness of human behaviors in designed landscapes. Based on the available literature the study focused on five factors namely; variety, safety, convertibility, scale and permeability which are established to influence human behavior in urban public spaces by eminent scholars. Above five factors were tested with reference to two urban recreational landscape designs emerged recently in the city of Colombo, Sri Lanka; Diyatha Uyana, Baththramulla and Urban Wetland Park, Nugegoda.

Certain design following behavior; users behaving as expected by the designer were observed in both cases. However some of the visitors were found to follow the design forcefully, acting in contrast to their psychophysiological comfort levels, significantly in Wetland Park which was identified as a negative point.

On the other hand these two recreational landscape designs were observed not to function fully according to the expectations of the designers. Certain deficient points in both cases leading in

to design against behavior were revealed by the study. Several design failures related to five parameters studied were identified. Lack of convertibility of spaces and furniture, inappropriate scale, lack of safety and permeability associated with isolation of space were identified as significantly common weak points associated with design against behavior.

Analysis of the findings of questionnaire survey conducted revealed that Diyatha Uyana is comparatively ranked high with reference to all the factors and stands in a higher position over Urban Wetland Park as an urban recreation landscape facility. It was observed that the participants were satisfied regarding the variety in spaces, facilities and visual experiences provided in Diyatha Uyana. Though safety provided was rated as satisfactory, the sense of security at Diyatha Uyana was associated with the provided security system using the guards but not in architectural design terms.

The lack of convertibility of design elements significantly furniture, the insensitivity regarding the scale and lack of permeability which result in isolated spaces were found to be significant in hindering people to involve in recreation activities freely in both cases. Lack of variety, convertibility and appropriate scale were identified as significant weaknesses in Urban Wetland Park contributing to comparatively low rating. Even though the anthropometric requirements were found to have achieved as per the set standards, the design solutions were not sensitive for the psychophysiological and behavioral requirements of human beings related to recreation. These significant weaknesses of design have led to a reduction of their utility value consequently reducing the profit to be gained from such facilities.

The study enlightened that there is much more to be comprehended in terms of human psychophysiological and behavioral traits associated with landscape architecture with reference to recreation. Designer or landscape architect has to carefully understand the diversely changing human feelings, emotions related to behavioral and situational needs and come up with strategic, creative design solutions which may effectively strengthen the bond between space and people. Landscape architect on the other hand should smoothly identify the opportunities given by the site to its fullest and convert these opportunities to fulfill the needs of urban community.
Design weaknesses like less convertibility, lack of safety, uncomfortable scale, isolation and less permeability may lead to stressed and unwell mindset of users. Accordingly, landscape architecture can be a killer or healer both based on the characteristics of a given intervention. It is the landscape architect's responsibility to help heal and release the stresses of urban dwellers by providing sensitive and responsive designs which naturally mingle with their psychological, physiological, social and behavioral expectations. In doing so variety, safety, convertibility, scale and permeability factors should carefully be introduced in correct proportions and manipulated effectively to achieve the corresponding expectations.

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