

Interior Landscape: Behavioral and Emotional Impact on Human Psychology

Shanta Pragyan Dash

Faculty of Architecture, Manipal University, Manipal
E-mail: dashshanta5@gmail.com

Abstract—Research have already proved that landscape had a detrimental impact on human psychology but the extent is still unknown. Human beings have always a tendency to respond to their environment based upon their perception, cognition and spatial behavior. Perception refers to the awareness of a space by information received through sensation of sight, hearing, smell, touch, taste. Cognition is the mental processing of these sensory information whereas spatial behavior refers to the responses and reaction to the environment.

The task of an interior designer is to create an environmental stimuli to respond these psychological stages as well as the secondary processes of effect, motivation and development. Most of the architectural features that are related to landscape design that directly or indirectly affects the user perception, need to consider its type, color, texture and finishes of these materials which are responsible to create the internal environment of such spaces.

Plants always bestow intangible benefits to mankind in one or the other ways. Physically contributing cleaner and healthier air, they improve our comfort and well-being by making surrounding pleasant and calm. Interior landscaping have always a positive impact of reducing stress, increase pain tolerance and improve productivity of people.

The paper aims at understanding the impact of green spaces and its effects on human psychology. It further explains about various types of interior landscaping and its integration within a built environment to enhance the experience of these spaces.

The paper concludes with formulation of guidelines that are to be considered in designing interior spaces where interior landscaping is an integral part of the spatial design.

Keywords: Built environment, Human psychology, interior landscaping, spatial behavior.

INTRODUCTION:

Landscape is always an essential component of urban environment. Its multifaceted functions primarily include controlling soil erosion, enhancing water filtration to soils thereby cooling the cities and reducing urban heat island effect. Furthermore, it improves air quality and promotes positive physiological, psychological and economical responses in people. A healthy lifestyle is not necessarily only physical well-being rather it also includes mental calmness and restoration as well. Instinctively, it seems that responding

to the changing seasons and climate is equally essential for survival. Plant color could be a cue to such changes.

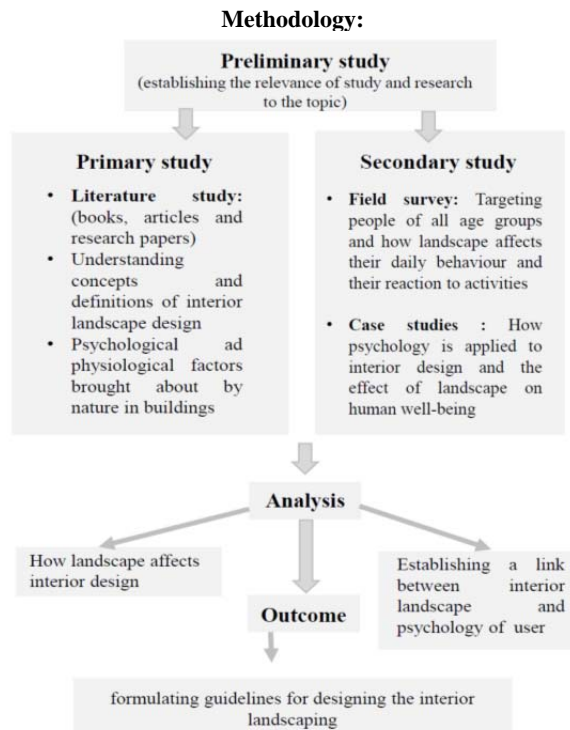
With the increase in urbanization, there in a growing concern about future generations' exposure to nature. Research had already proved that adult preferences and attitudes to plants were strongly influenced by their childhood interaction with nature. In today's scenario, interior landscaping is a way finding attempt to bring nature to home to have a positive impact with childhood involvement with landscape and nature.

Interior landscaping have marked a significant impact on human psychology. It improves indoor air quality, lower down stress, and faster recovery from illness, reduces mental fatigue and increases productivity.

In order to understand the role of interior landscape on human behavior, the following aspects need to be considered:

- Application of landscape elements within a structure and their impact on the interior spaces.
- Understanding the dynamism of landscape on the visual and sensory composition of human senses.
- Analyzing the psychology and response of human to landscape within a structure.
- Understanding the perception and aesthetic values of interior landscape thereby creating a physiological connection between the users and the nature.

The psychology of the users and their response to an interior landscape design space is primarily based on their perception on texture, color, light, sensitivity, temperature, noise of that spatial layout.



- Reducing background noise as plants absorb, reflect and refract sound, cutting down the background echoes.
- Cooling a building by reducing the indoor air temperature and reducing the load on air conditioning systems.
- Other positively marked benefits which are not scientifically proven but have results upon the research:
 - Stress reduction
 - Increased productivity
 - Quicker recovery from surgery
 - Greater attentiveness
 - Reduction in complaints of symptoms associated with sick building syndrome” (Freeman, 2011)

Biophilia:

Biophilia is the essential human attraction and association to nature and its interaction especially to all the biotic and abiotic components of nature. “This tendency became biologically encoded because it proved instrumental in enhancing human physical, emotional and intellectual fitness during the course of human evolution” (Stephen R. Kellert, 2008). People’s belief on touch with nature has evolved due to these positive interactions in a large natural environment. This development has been largely enabled due to sensory features such as light, sound, smell, wind, weather, water, vegetation and wildlife. Characteristic features of biophilic design is listed below (Table-1).

Key Dimensions	Attributes and qualities
Prospect (ability to see into the distance)	Brightness in the field of view, strategic viewing points, view corridors, horizon/sky imagery.
Refuge (sense of enclosure or shelter)	Canopy effect, variation in light levels, enclosing surfaces, penetrable barriers for view outs
Water (indoors or in views)	Glimmering or reflective surface, moving water, symbolic forms of water.
Biodiversity	Varied vegetation indoors and outdoors, windows designed and placed to incorporate nature views, windows designed and placed to incorporate nature views.
Sensory Variability	Changes in variability such as environment, colour, temperature, air movement and texture.
Biomimicry	Designed derived from nature, use of natural patterns, forms and textures
Enticement	Curvilinear surfaces that gradually open information to view

Table-1

Elements of interior landscaping:

Interior landscaping can be broadly classified into two types: Softscape and Hardscape. The softscape comprises of natural elements such as the plants species, shrubs, grass and all other plant typologies. The softscape elements used in interior landscape design have specific requirements for regular

Literature study:

Why does the landscape within a building create a huge impact on the people using the building?

Over many years, countless number of research papers and scientific experiments have demonstrated the benefits of indoor landscaping, explaining how landscape in interiors have a major role regarding the health and well-being of the people, reducing energy costs and increase productivity and profitability. But the most profound research that has an impact can be taken up of “**Sick Building Syndrome**”. “It is a term used to describe situations when people experience acute ailments and discomfort, which seem to be linked to time spent in a particular building. Common symptoms of Sick Building Syndrome, such as itchiness, dry skin, eye and throat irritations, headaches and nausea, seem to be closely related to poor indoor air quality. Often, the presence of volatile organic compounds, mold spores, poor ventilation and badly-adjusted temperatures are blamed.” (Freeman, 2011) (EPA, 2009). The indication is clear strong: It is evident that buildings with plants are so much better than buildings without. However, what these studies have not convincingly elucidated is why interior landscaping works. Indoor plants are clearly related to improving wellbeing and health so it seems likely that there must be a psychological reason. The major advantages of indoor landscaping may be summed up as below:

- Removal of unstable organic compounds from the air enhancing IAQ.
- Reducing level of CO2 in the buildings.

maintenance and growth such as temperature, water and sunlight. These features often varies from outdoor plants as the interior and exterior environment is different and hence the requirements will vary. Indoor plants should be chosen specifically according to amount of sunlight received by them as they are kept within the building and amount of sunlight within the building won't be as much the ambient sunlight present outside. Special care must be considered to control the internal temperature of the structure as well. Indoor plants usually have low water requirement and require low maintenance but the growth maybe slow and sometimes if special care isn't noted the plant may expire.

The hardscape elements of interior landscape are those materials that are naturally available such as stone, wood and other man made features that highlight a contrast along with the presence of the softscape. Maintenance and upkeep for the hardscape is much simpler as compared to the softscape. The following are some of the indoor plants used as softscape features within a building (Fig-1).



Fig-1

Interior walling systems:

Vertical Garden Wall: A vertical garden wall is a type of wall that is both unrestricted and erect or part of the building that can be partially or fully covered in a variety of vegetation (Fig-2). Usually there is a medium of growth such as soil or an inorganic medium that helps sustain the vitality of the wall. The effect of vertical walling system on building façade and interior spaces are shown below (Fig-3).

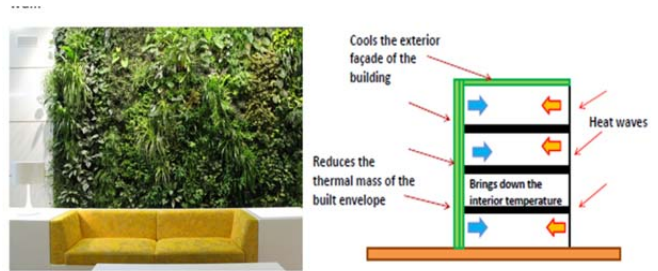


Fig 2: Example of a vertical garden wall

Fig 3: Effect of vertical wall on indoor temperature

There are two main types of garden walls: Façade walls and living walls. Façade walls (art green wall) are made of climbing plants or creepers that grow directly on or individually designed provision for support (Fig-4). Living walls consist of modular panels made out of geo textile or stainless steel containers with a growing medium and vegetation. There are three varieties that can be used for growth support in living walls: Mat media, loose media and structural media.

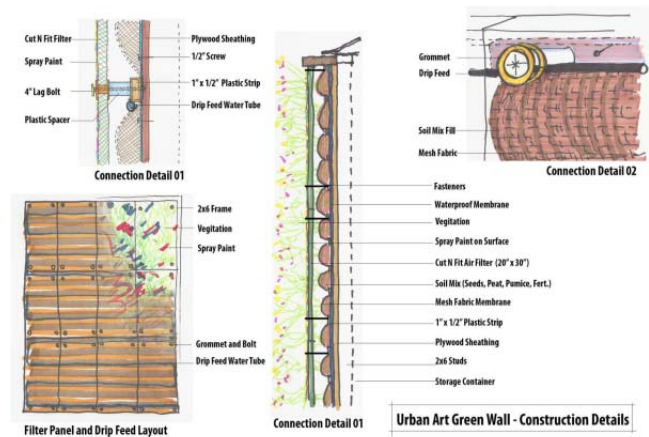


Fig-4

In loose media, the soil is packed into a bag or shelf and then it is installed onto a wall. Its maintenance basically lies on the re-installation of shelves in every two years (Fig-5). Mat media is a thin single or multiple layer medium of jute or foam based material into which roots cannot penetrate and water will not be able to pass through (Fig-6). Structural media has a modular pattern of stainless steel in which plants grow and take its own path while maturing (Fig-7). It requires less maintenance but cost of installation is much higher than the other two systems.

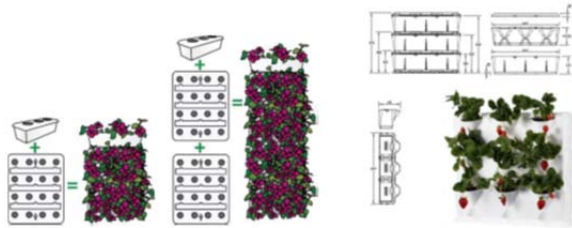


Fig 5: example of diagrams of loose media

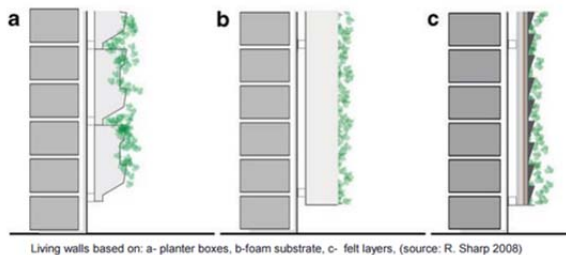


Fig 6: example of mat and loose media



Living walls components: 1- Panels, 2- Non-soil structural growth medium, 3- Plants, 4- Remote irrigation/fertilization system, 5- Stainless steel frame, (Source: Gsky.com)

Fig 7: diagram showing detail of structural media

Interior flooring systems:

Various types of flooring systems can be used for interior landscaping by combining both hardscape and softscape elements like bio-tiles, natural carpet tiles, bamboo flooring and exposed stone flooring (Fig-8).



Fig-8

Psychological factors that affect human perception of a space:

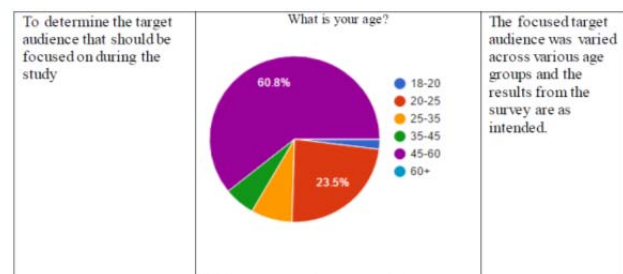
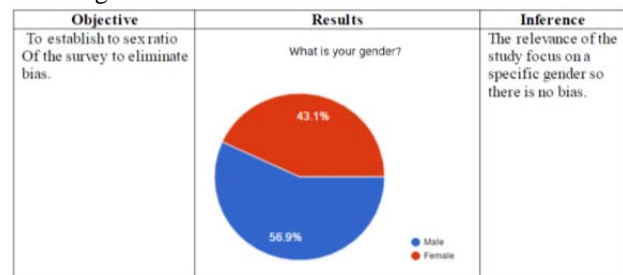
“There is no doubt whatever about the influence of architecture and structure upon human character and action. We make our buildings and afterwards they make us. They regulate the course of our lives.” (Winston Churchill, addressing the English Architectural Association, 1924).

The main psychological determinants that affect human perception of a space are majorly the five senses and how each of them perceive various combinations of sight, sound and smell through the use of color applications, bringing in natural sounds, stress level alternations etc.

The science of environmental psychology can influence people so intensely that some studies believe that it can help create positive atmospheres enough to help users in declining health. The architecture and surroundings of a place has thus, proved directly and indirectly affect the psychology and behavior of humans. An environment-behavior study in architecture is a contemporary approach to the traditional human purposes of architecture. Instead of building for the basic purpose of shelter, protection and privacy, people are becoming aware of the greater aspects of architecture.

Field survey:

A survey was conducted for a sample of 50 people targeting no specific age group or gender (Table-2). The survey attempts to take this study to a more personal level by interacting with people and trying to understand their perception of spaces through a series of questionnaires. The results from this survey conclude that there is a relationship that exists between users and their perception of spaces considering scenarios.



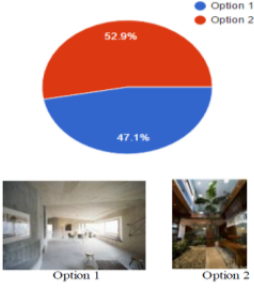
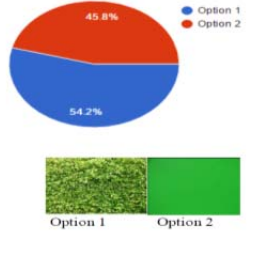
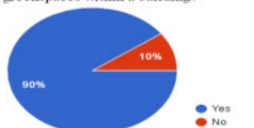
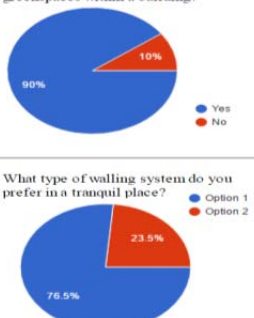
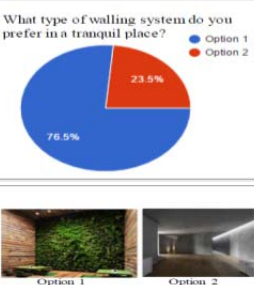
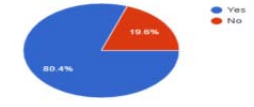
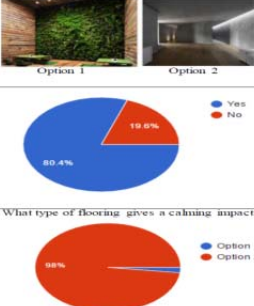

<p>To identify the preference of the public in terms of what appeals to them more.</p>	<p>What space appeals to you more?</p> 	<p>This shows us that the public prefers the interior landscaping more than the one devoid of plants.</p>
<p>To understand the human perception towards green, whether they are more drawn towards a green painted wall or a green wall with plants</p>	<p>Pick one option.</p>	<p>The result of the survey conducted has preference towards the wall covered in green plants. Hence the majority of the public is drawn to the green wall as</p>
<p>To determine whether the general public likes the integration of green spaces within a building</p>	 <p>Do you like the integration of greenspaces within a building?</p> 	<p>opposed to the green painted wall.</p> <p>The results show a majority for the integration of green spaces.</p>
<p>To determine what type of wall would the public prefer in a quiet place.</p>	<p>What type of walling system do you prefer in a tranquil place?</p> 	<p>The results conclude that majority of the public prefers the green wall.</p>
<p>To establish whether the users would prefer the sound running water within a quiet place.</p>	 	<p>Majority of the public likes the sound of running water as it provides a calming effect</p>
<p>To determine what type of flooring is preferred by the general public</p>	<p>What type of flooring gives a calming impact</p>  	<p>Just as the previous results have displayed, majority of the public prefers the green option.</p>

Table-2

Case Studies and analysis:

The Art of living International Centre, Bangalore

The Art of living Centre is one of the main ashrams of the Art of Living franchise and is located on the outskirts of the Bangalore city. It is one of the biggest ashrams which caters the devotees and provides a recreation space for various activities and services provided by the ashram ties. Upon entering the ashram campus there is a sudden change in the atmosphere as compared to the industrial and bleak surrounding of the ashram, the temperature within the center is much cooler compared to its neighboring areas (Fig-9). This temperature and atmosphere difference is due to the presence of various kinds of plants and landscaping mechanisms that helps reduce the heat throughout the campus.



Fig-9 shaded walkways throughout the campus

The central amphitheater is one of the major highlight of the entire campus. It has a water body in the middle which has an elevated stage. It draws the attention of the visitors towards it due to its reflective nature (Fig-10).



Fig 10: central amphitheatre

Fig 11: the use of variety of local materials

Throughout the site all the ordinary service buildings such as the souvenir shop and the dining hall are made of local earth materials such as stone and brick and this creates a sense of welcome that attracts the users towards it (Fig-11).

Hakuna Matata, Manipal

Hakuna is a popular restaurant located in Manipal that has a unique interior design that includes indoor landscaping and the environment of the place is positive and soothing. The interior of the place is a semi open place that has grass tiles as its flooring and central pathways made of laterite stone that connect the main access to the tables (Fig-12). There are water pools that located along the sides of the walls and the main watch catchment acts like a fountain when the restaurant is open in the evening and so it has an ambient sound of flowing water which creates a very relaxed environment which is ideal for a restaurant (Fig-13). There are indoor plants (Areca Palm)

located along the periphery of the walls that provides a natural ambience and gives it a calming atmosphere (Fig-14).



Laterite pathway Fig 12: interior view of the restaurant



Fig 13: water bodies located along the sides

Fig 19: indoor plants

The color scheme of the whole restaurant is a combination of earthy tones with slight hints of red and brown from the woodwork and the yellow light provided gives it a cozy glow. All together the colors complement each other as it is the right mix of warm and cool colors to give the perfect ambience.

Formulation of guidelines:

From the data that has been collected an analysis can be drawn to create necessary guidelines and design the best possible indoor landscape that positively affect the human psychology. There are 8 main features that can be drawn from the study which are formulated as guidelines as follows:

- **Creating the feel of nature indoors:** Careful selection of plant species that shall be well suited to the indoor setting with maximum aesthetic value.
- **Creating a view:** Integration of both the exterior and interior landscaping to highlight the horizon outside creating a sense of peace, comfort and security.
- **Use light and shade to create interest:** Light can always be associated with warmth and generating curiosity thereby generating a positive response. The use of gentle shadows playing along with vegetation shall also generate interest and sense of wonder.
- **Use of natural materials:** Natural as well as locally available materials always gives a sense of comfort and belonging to that space and culture subconsciously altering our minds into passive relief.
- **Refuge, shelter, privacy:** Interior landscaping can also be used to create a buffer spaces or as a mean of segregation in a temporary manner so that it creates a sense of flexibility that provides security to the user.

- **Water feature:** Water draws the natural tendency of a man to turn himself towards its reflective surface as well as provides a cooling comfort which helps in bringing down the overall temperature of the building. So its incorporating in interior landscape design shall have always a positive impact on the users.
- **Natural scents and odors:** Indoor landscaping shall also be accomplished by incorporating scented plant species that provide natural scent throughout the building and stimulated the sensory smell which helps the user to experience the space.
- **Use of color:** The effective use of color through the variety of landscape elements helps create a balance in the structure and helps create a unique character that can be associated to the place.

Conclusion:

Modern spaces should be rationally designed to be linked with new generation with nature. These behavioral determinants should be manipulated in such ways to harmonize with the needs of modern spaces to design enhanced spaces in the future. This will help improve the experience of any and every user (regardless of age), which in turn can help them for their healthy being.

References:

- [1] Anthes, E. (2009). How Room Designs Affect Your Work and Mood.
- [2] Bjørn Grinde, G. G. (2009). Biophilia: Does Visual Contact with Nature Impact on Health and Well-Being?
- [3] Galindo, M. P. (2000). Environmental aesthetic and psychological well-being.
- [4] Han, K.-T. (2008). Influence of Limitedly Visible Leafy Indoor Plants on the Psychology
- [5] Patricia Martyn, E. B. (2011). The relationship between nature relatedness and anxiety.
- [6] Stephen R. Kellert, J. H. (2008). Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life.
- [7] Ulrich, H. a. (n.d.). The biophilic hypothesis.