PUBLIC SPACE DEVELOPMENT DIMENSIONS: A CRITICAL REVIEW

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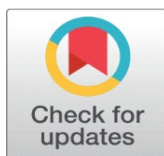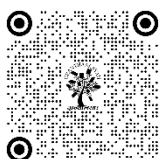[1] Department of Architecture, Gandhi Institute of Technology and Management, Visakhapatnam, A.P., Research scholar Department of Architecture, Guru Nanak Dev University, Amritsar, Punjab, India
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ABSTRACT

Public spaces are integral part of human life since ancient civilization. The traces can be found if form of Greek's agora, Roman's forum, Indian ghats etc. For the understanding of this crucial space, the paper presents a comprehensive review of literature relating to components for successful public spaces. The paper intents to understand initiatives adopted around the globe for the development of Public Space by comparing the suggested components and identify the gap in context of developing country with high density such as India. A systematic literature review is conducted to understand the expectations and requirements from public place. The finding highlights that women safety, gender ratio, engagement in and around the public space are yet to be explored. Also, safety cannot be equated with the security as it is a subspace of same. The theory of broken window needs to be mitigated and amalgamated with development of public place, to ensure maximum utilization of public space in developing countries. The study is helpful for constructing/ modifying the public space development toolkit.

Keywords: Public Space, Open Space, Urban Space, Human Needs, Theory of Broken Windows

1. INTRODUCTION

Public Open space is a vital and essential component of the city to retain urban life quality. " Various researchers and authors introduce enormous terminology and definitions to explain "Public Space" such as open space, public space, public gardens and parks, green space, urban greenery, etc. Udas-Mankikar (2020)(*Formulating Open-Space Policies for India's Cities: The Case of Mumbai*, 2020)". A neighborhood's and a place's culture can be built with the help of public open space. It is one out of 15 core categories proposed in the "Liveability Standards in Cities" by the Ministry of Urban Development (MoUD) and Smart City proposals (SCPs) Ministry of Urban Development. (2017). Although being one of the vital

indicators of livability standards and Smart cities, the government fixes no benchmark to evaluate (Liveability Standards in Cities. New Delhi, India: Ministry of Urban Development, Government of India, n.d.). This urban life parameter is under tremendous pressure due to rapid urbanization and population shift in an urban area. The improvement of public space is vital to counteract the impact of urbanization on urban life. Thus, there is a dire need to regulate the distribution and usage of public space. The intent of the study is to understand initiatives adopted around the globe for the development of Public Space.

2. REVIEW OF PUBLIC SPACES

With objectives to determine the characteristics of adequate public space and its measures, Vikas Mehta 2007 proposed goa od public space index. He emphasized meastandardsr the right public place with the set of parameters to appraise the qualitative aspect of public open space. The study was conducted in the three principal streets of the U.S.

The selected streets are major neighbourhood commercial streets with similarity in terms of demography, population, and other urban amenities along with proximity to each other. Various structured and non-structured observations were recorded. Based on the observations and data collected, the author proposed a "Good Public Space Index" on a scale from zero to ten to measure the qualitative aspect of public spaces. Following are the significant indicators of GPSI Mehta (2007).

1) "The intensity of use": defined by no. of users involved in a static activity.
2) "The intensity of sociability": defined by no. of users involved in the group or social activity.
3) "People's duration of stay": defined by the amount of time spend.
4) "The physical diversity of use": defined by variation in usage of space in a day.
5) "The variety of use": defined by a variety of activities.
6) "The diversity of users": defined by different age groups and gender.

The research was limited to commercial neighborhood streets and needed to be studied in other public spaces in an urban context.

With the evolution of the new type of public place in the contemporary era, author Mehta (2014) felt the strong need to develop an empirical method to evaluate the quality of public space. He proposed a new model to evaluate the public space named "Public Space Index." There were so many definitions and characterization given by various authors from time to time; the perception given by Carr et al. and Jan Gehl are found to provide the most appropriate. As per Carr (1992), public space should be "responsive, democratic and meaningful," and Ghel (1987) stated, "outdoor activities can be further classified as necessary, optional and social along with use and sociability."

Based on explanations are given by Carr et al. and schema provided by Jan Gehl, the paper proposes a theoretical framework for evaluation of public space. The framework comprises of five key parameters, which are an essential quality of public space. They are Mehta (2014):

1) "Inclusiveness": Quality of including different types of people and treating them all equally. In other terms, "Flexible and Ambiguous."

2) "Meaningful activity": to be able to acquire place attachment by means of various activities and sociability.

3) "Comfort": to be able to relieve from climatic factor as well as a physical factor such as the arrangement of seating etc.

4) "Safety": Quality and physical condition of the place, which gives a sense of security, such as the presence of people around the day, surveillance measure, etc.

5) "Pleasurability": spatial character which contributes to the positive aspect of the public place.

The sub-parameters are created based on structured and semi-structured observation and interviews during different times of day in various public places. The weights are assigned by randomly asking the user to give a rating to various parameters on a scale of 0 to 2.

The results produced by the Public Space Index help us to know the deficient characteristic of public space and gives a direct clue of where to improve so as to make a public space successful. As per the author, applying PSI in a different context will give different results as well as there is scope to develop another parameter as per requirement.

Johannes Parlindungan Siregar in 2014 evaluate the qualitative aspect of public place by GPSI. To analyze and evaluate indicators produced by GPSI, multiple linear regression is correlated between GPSI and various build and outdoor components. The findings of MLR are motorized vehicles have a negative impact on GPSI. Impacts on GPSI that are both positive and negative are directly correlated with social use intensity and visitors' length of stay Siregar (2014).

GPSI can be further developed in the qualitative parameter of aesthetics and placemaking, along with extensive indicators to measure the success of public space in relation to appropriate outdoor activities and the impact of built components of surroundings. In order to achieve precise results, the scientific method can be developed to measure various indicators of GPSI.

Dietrich & Kengyel (2016) aim to determine the characteristics that contributes for creating livable public space. Along with the influence and impact of urban spaces on society is studied. Twelve conventions for designing of public space by Jan Gehl are taken as the basis of the study. All the twelve criteria were analyzed at different urban public spaces for designing adequate public space, and other parameters were removed from the scope. The twelve conventions initially proposed by Gehl are referred to independently, which losses its complete sense of matrix. The finding of surveys carried out showed that focusing only on designing parameters would not lead to achieving successful public space Dietrich & Kengyel (2016). The necessary infrastructure, like availability of water, sanitation facility, comprehensive speech right, etc., are must considerable factor for successful public space.

Author Dorota Mantey discussed a new six axial model for assessment of Publicness based on an empirical study of the existing parameter of Publicness. All the proposals till now have a significant drawback of a limited number of parameters for identification and quantification that too are based on the author's observation. It consists of three-dimension which are further divided into subgroups Mantey (2017).

Diversity: The Diversity of activities, The Diversity of users Mantey (2017)

Management: Type of management, Freedom of access, use, and behavior Mantey (2017)

Accessibility: Financial barriers Fees, Spatial barriers Mantey (2017)

The proposed model was tested in various public spaces of the small town 'Podkowa Leśn.' It was found that comfort, proximity, and association with nature are a prime factor of public places for the residents of Podkowa Leśn. Findings also showed that different age groups of people have different choices of public space. The results of the six-axial model are represented by a graph representing various dimensions of Publicness.

Jocelyn Evans, attempted to evaluate the public open space by PSI (Public Space Index) tool and analyzed the result for a mid-sized city park. The different types of public spaces comprised in the study are parks, playgrounds, squares, etc. However, applying PSI in a medium-size city brought in opportunity for enhancement and transformation of parameters to capture qualities in medium-size cities. In a large city, people may commute to distant POS due to insufficient availability of green areas. Thus, it is concluded that there is much scope for improvement in PSI for middle size city. The modifications are suggested for parameters: "Pleasurability and meaningful activities" Evans et al. (2019). The majority of parks suffered in scoring due to lack of Diversity of users, food services, and natural Diversity, which are not essential for residential neighborhood parks.

Mohd. Shoeb Jafri and Mohammad Rajaullah, focused on revealing the importance of green open space in an urban setup. The trends of recreational space of significant cities in India were studied, including Mumbai, Hyderabad, Chennai, Chandigarh city, etc. Due to development pressure in these cities, open recreation spaces are depleting at an alarming rate. Thus, burden on remaining recreational open space is raised, which is having a direct impact on human health. The author has emphasized the importance of green open space by directly correlating the same with public prosperity and lifestyle aspect. The benefits of green open spaces are categorized as tangible and intangible benefits. Tangible benefits comprise Ecological Benefits, Planning Benefits, and Economic Benefits and intangible benefits comprise Health Benefits and Social Benefits.

The author presented the following argument Mohd et al. (2018).

- Inadequate public open spaces: According to planning regulations, 0.2 Ha/1000 people of land must be set aside for green, open recreational places, however many cities have not kept up with this requirement.

- Deficient playground: There aren't many parks available, and also, they don't accommodate all age groups.

- Preservation of green recreational area: due to insufficient capital, most recreational spaces are not well maintained thus are non-inviting to the public.

Problems like lack of parking and equipment were also discussed. Planning of public open space can be done by 1. Demand approach, and 2. Supply approach. It was concluded that due to imprudent decisions, land use is changed from public open space to others without considering environmental and health benefits associated with it. Accessibility and per capita availability should be an integrated part of urban design following international standards.

Shahfahad et al. (2019) highlights the issue that any agency gives no defined cap for per capita availability of POS along with its size, spatial distribution, and characteristics. As per WHO 9sqm, UN 30sqm and EU 26 sqm. The study's primary goal is to comprehend how urban green space affects POS, particularly in Delhi's northern region. The five parameters chosen after rigorous literature study for classification of POS are vegetation, parks and playgrounds, open green patches,

open space/ barren land, population density. Google Earth is used as the data source for the collection of the above-said data. In the first step, experts from various fields such as Architect, planners, geographers, and sociologists were requested to rank the parameters. In the second step, 130 residents were requested to assign weightages Kumari et al. (2019). The final relative weightage is calculated using the analytic hierarchy process (AHP) Priority Calculator.

Udas-Mankikar (2020) raised the issue of depleting public open space over hasty expansion. The paper highlights the current legal framework from the central to the municipal level associated with open space. Municipal Corporation of Mumbai has raised the percentage of open space area from "26% in 2012 to 46% in 2016 only by changing open space". This change has raised the percentage of open space in Mumbai, leaving behind Australia and Sydney in the race. Planning organizations in India adhere to the URDPFI recommendations, which recommend that 10-12 sqm./person are ideal (*Formulating Open-Space Policies for India ' s Cities : The Case of Mumbai*, 2020). The paper concluded that open space development should be done in a holistic manner since it has a direct impact on people. Revision in existing policies is recommended.

Salih & Ismail (2018) focused on enlisting the criteria/ parameters that contribute to socially interactive public open space. The study found out that "design, activities, access and linkage, administration and maintenance, place attachment and users' characteristics" are essential for adequate socially interactive public open space. A per analysis done by 25 different research papers and books concludes that access and linkage is the prime parameter where "sociability, activities, and degree of comfort" are secondary parameters Salih & Ismail (2018).

Nurhayati Abdul Malek and Amanina Nashar (2018) have raised the concern of underutilized neighborhood parks in the majority of Asian cities and Malaysia to be one of them Services (2018). Numerous researches are conducted on the quality of good parks, and no consideration is given for green open spaces in developing countries. The research intends to develop an assessment tool to assess the Quality of Neighbourhood Park from a Malaysian point of view. The following three theories are used as a ground to develop an assessment tool. They are Maslow's Theory of Human Needs (1954), Theory of Reasoned Action (TRA), by Ajzenand Fishbein (1975), and Theory of Urban Parks and City Sustainability (Cheisura, 2004). After analyses, an assessment tool for Neighbourhood open space is proposed was proposed. The assessment criteria of QNP are distance, location, facilities, accessibility, landscape elements, necessary facilities, maintenance, ambiance, natural surroundings, safety, natural preference, design preference, participation, and satisfaction.

Thilakaratne (2019), examined the various criteria that directly impact the livability of public space. For the purpose of the study, seven open spaces from the dense urban area of Hong Kong is selected, from where data is collected by various methods such as photographic survey and photographic survey Thilakaratne (2019). The open spaces are easily accessible, whereas whether conditions like High humidity, hot weather, stagnant wind, and air pollution are significant hurdles. As per the planning department and draft outline zoning plan, safety is considered as a prime factor along with location, identifiable entrances, surface texture, and facilities, etc.

The parks are small in size and are close to residential and commercial buildings with limited facilities. The open spaces do not receive direct sunlight due to the mutual shading of high-rise buildings. The open space doesn't have a designated area for different activities like walkways, relaxing areas, etc. The author

suggested focusing on user comfort, safety, appropriate material choice, and native trees and plants should be adopted to reduce water management, which will also contribute to improving the microclimate.

Eriawan & Setiawati (2017) raised the issue of unused open space or absence of Publicness in public place. To evaluate public place, "Public Space Index" Mehta (2014) proposed by Mehta (2007) is used as a tool for evaluation. The Imam Bonjol Park lacks the variety of users, length of activity, lack of social interaction among users, and relatively short average time spent by visitors utilizing this public space Eriawan & Setiawati (2017).

Seemantini Soraganvi highlighted the concern of women's safety in a public place. In Indian cities, violence against the female in public space remains anonymous; thus, the same cannot be measured Soraganvi (2017). Two successful projects, one of Vienna and the other of Paris, were taken as a case study. Results concluded that Eye on street, accessibility, no visual hindrance, different activity, proper lighting, etc., are an essential factor to have safe public space. The author also suggested that the planners need to understand and think out of the box about the usage of city space from men's and women's perceptions and how both coexist at the same time. The need of people for public places also changes from place to place according to culture and lifestyle. Raeisi et al. (2010)

As per the report of Municipal cooperation Bhatinda, "Action Plan to Increase Green Cover in Bhatinda City," it was proposed to count agricultural land in the outskirt of the city into green cover to increase the percentage of green cover in the city. Around 32.49% of MC Bathinda are used for agriculture. According to the announcement, the Municipal Corporation already has more green space than 15% of the overall area. With the assistance of the relevant departments, the Municipal Council will draught a Green Area policy to ensure an increase in green cover during and in conjunction with future development Imam & Banerjee (2016).

Theory of broken windows:

The "broken windows" theory was proposed by James Q. Wilson and George L. Kelling in the year 1982 and used as metaphor for anti-social behavior and civil disorder Van et al. (2017). According to the "broken windows" idea, apparent indicators of disorder and neglect, such as broken windows or litter, might enhance criminal activity and antisocial behaviour Ren et al. (2019). This is assumed that neglecting to maintain and care for public parks might result in a rise in crime and other unwanted activities According to the theory, when a park is poorly maintained and exhibits signs of neglect, it sends a signal that no one cares about the park, and that it is a place where illegal activities can take place without consequences. This can lead to an increase in activities such as drug use, vandalism, and other forms of criminal behavior Schappert (2017). On the other hand, a clean, well-kept park communicates the message that illegal activity will not be permitted and that the park is respected and cared for. This can discourage illegal activity and encourage civil behaviour in the park. Prioritizing upkeep and maintenance, such as routine cleaning, planting, and repairs, is crucial for putting the broken windows theory into practice in public parks. Community, local government, and park management organisations can work together to accomplish this.

In conclusion, the broken windows theory can serve as a useful framework for comprehending the connection between upkeep and crime in public parks and can serve as the foundation for policies that encourage good social conduct and discourage criminal activity.

Maslow's theory of Human needs

Maslow's hierarchy of human needs (1954) is well-known when it comes to the topic of human needs in urban studies. Maslow's theory suggests that human needs are arranged in a hierarchy, with lower-level needs needing to be satisfied before higher-level needs can be addressed Mehan (2017). The hierarchy includes five main levels as shown in the figure below.

Figure 1
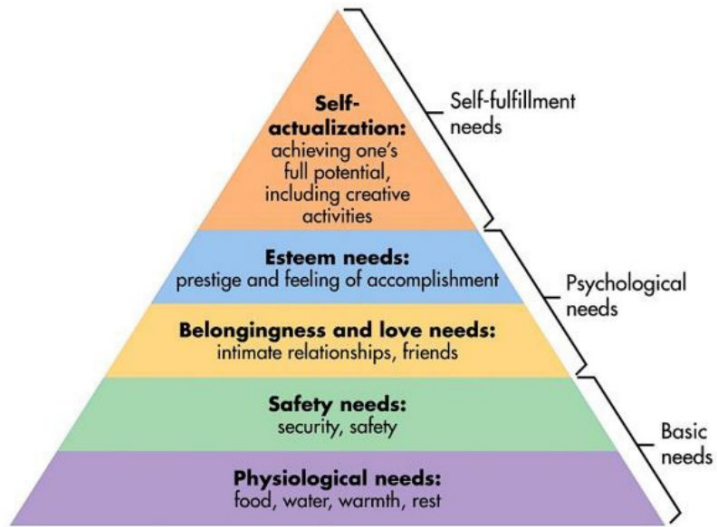
Figure 1 Maslow Human Needs Hierarchy Maslow (1970)

Table 1

Table 1 Translation of the Human Needs for Public Places		
S. No.	**Human Needs**	**Spatial Qualities in Design**
1	Physiological Needs	Public places can meet these needs by providing clean water fountains, restrooms, and places to sit and rest.
2	Safety Needs	Public places can meet these needs by providing well-lit areas, emergency call boxes, and security personnel.
3	Belonging Needs	Public places can meet these needs by providing spaces for socializing, such as picnic areas, playgrounds, and community centers.
4	Esteem Needs	Public places can meet these needs by providing opportunities for people to showcase their skills and talents, such as art exhibits, performance spaces, and sports fields.
5	Self-Actualization Needs	Public places can meet these needs by providing spaces for education and learning, such as libraries, museums, and cultural centers.

Overall, public places that aim to satisfy the diverse range of human needs can create a more inclusive and welcoming environment for all individuals.

Theory of Reasoned Action

Martin Fishbein and Icek Ajzen created the Theory of Reasoned Action (TRA), a social psychological framework, in the 1970s. It contends that a person's attitude

towards a conduct and their subjective norm-the perceived societal pressure to engage in or refrain from engaging in a behavior—have an impact on that person's behaviour.
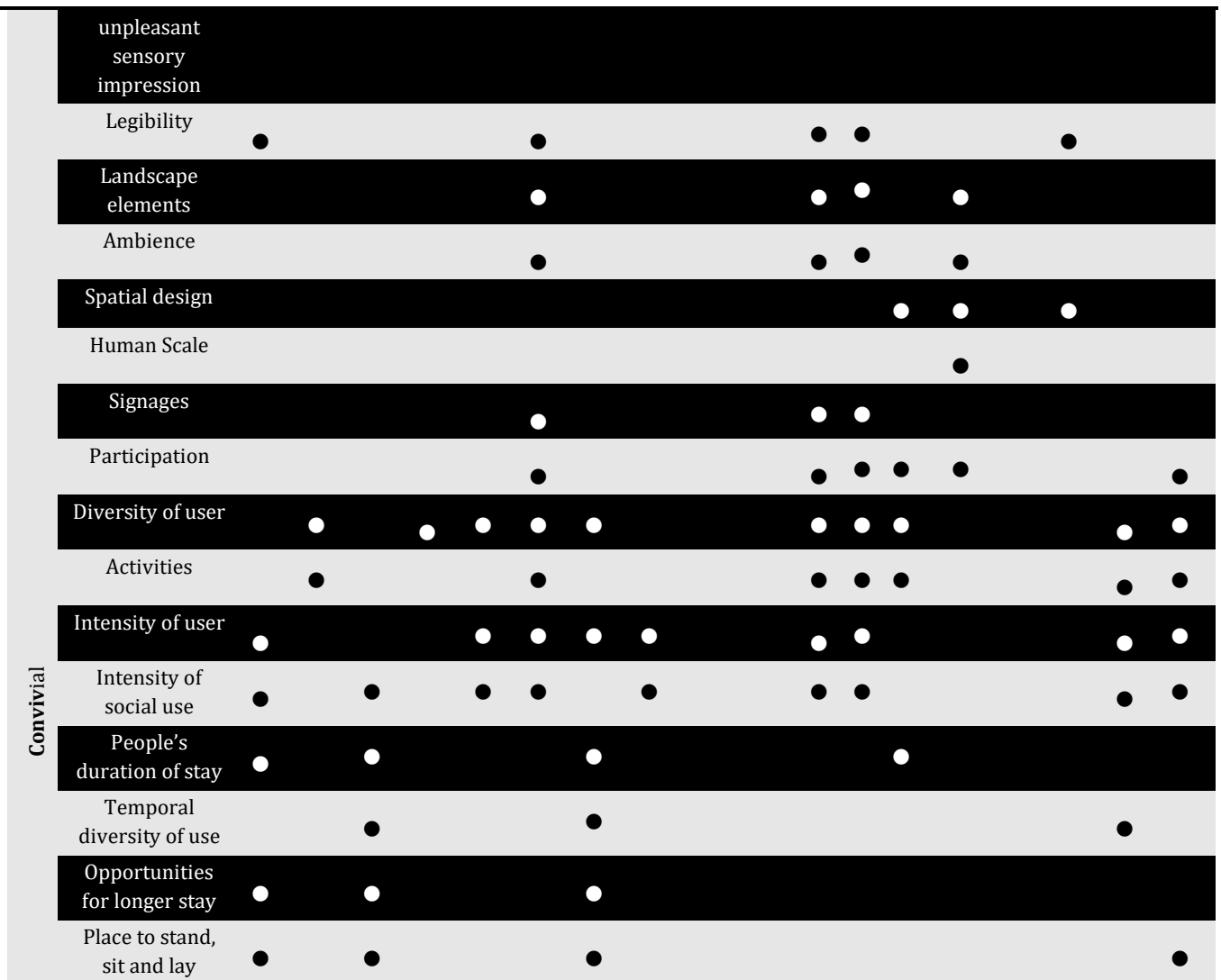
A person's attitude towards an activity is influenced by their ideas about the behaviour and its effects, claims TRA. Their impression of what they believe others want them to do and their desire to live up to those expectations shape their subjective norm. According to the model, a person's attitude and subjective norm together determine whether they will engage in a particular conduct, which in turn affects their actual behaviour. The hypothesis has been used to explain a variety of behaviours, including consumer, social, and health behaviours.

The dimensions of public spaces proposed by various authors are compiled in tabular format, to identify correlation and research gap.

Table 2

Table 2 Categorization of Dimensions and its Consideration by Various Authors

Dimensions of public space	Sub-dimensions of public space	Jan Gehl	Van Melik	Nemeth & Schmidt	Georgiana Varna and Steve Tiesdell	Langstraat and Van Melik	Vikas Mehta	Dorta Mantey	Johannes Parlindungan Siregar	Dietrich & N. Kengyel	Jocelyn Evans	S A Salih and S Ismail	Nurhayati Abdul Malek, Amanina Nashar	R Thilakaratne	Tomi Erawan and Lestari Setiawati	Seemantini Soraganvi
Concrete	Linkage					●		●				●				
	Distance												●			
	Location												●			
	Amenities									●			●			
	Operations					●			●					●		
	Maintenance										●		●	●		
	Management		●	●	●	●	●	●	●			●				
Cognitive	Pleasurably	●					●		●		●	●				
	Comfort						●		●		●	●				●
	Microclimate		●											●		
	Safety from traffic and accidents	●														
	Protection against crime and violence	●	●							●						●
	Protection against	●					●			●	●	●		●		●

| Category	Component																
	unpleasant sensory impression																
	Legibility	●					●			●	●			●			
	Landscape elements						○			○	○		○				
	Ambience						●			●	●		●				
	Spatial design											●	●	●			
	Human Scale												●				
	Signages						●			●	●						
	Participation						●			●	●	●	●				●
	Diversity of user		●		●	●	●			●	●	●				●	●
	Activities		●				●			●	●	●				●	●
	Intensity of user	●				●	●	●		●	●					●	●
Convivial	Intensity of social use	●		●		●	●		●	●	●					●	●
	People's duration of stay	●		●				●				●					
	Temporal diversity of use			●				●								●	
	Opportunities for longer stay	●		●				●									
	Place to stand, sit and lay	●		●				●									●

3. METHODOLOGY

Various research paper related to public space from journal database (Scopus, WoS, Google scholar etc) and websites are reviewed. Structured content analysis is used as research tool to identify various components and concepts of public space. The approach helps to conclude inferences from the text by condensing large amount of text to fewer words. Salih & Ismail (2018). Further analysis is done by preparing matrix of components identified from literature review. The similarities, differences and gap are identified.

4. REVIEW AND DISCUSSION

In this section, the major components from literature study are represented in graphical form. It is observed from the literature review that dimension proposed in the initial time focused much more on ownership and its management, whereas publicness is added as major parameter in latter time. Along with addition of components weightages were also introduced. Initially dimensions of public space were interdependent which were gradually shifted to independent components on latter stage.

Accessibility, inclusion, and safety are most prominent and explored dimension of public space as shown in figure 1. Function and use, users, management, sociability, amenities, and comfort are moderately explored components, whereas research on perception, control, secured, linkages, micro-climate and scale are least explored components of public space. It is found that management of public space in terms of routine maintenance lacks in major studies. The activities conducted around public space also directly affects its usability.

Figure 2
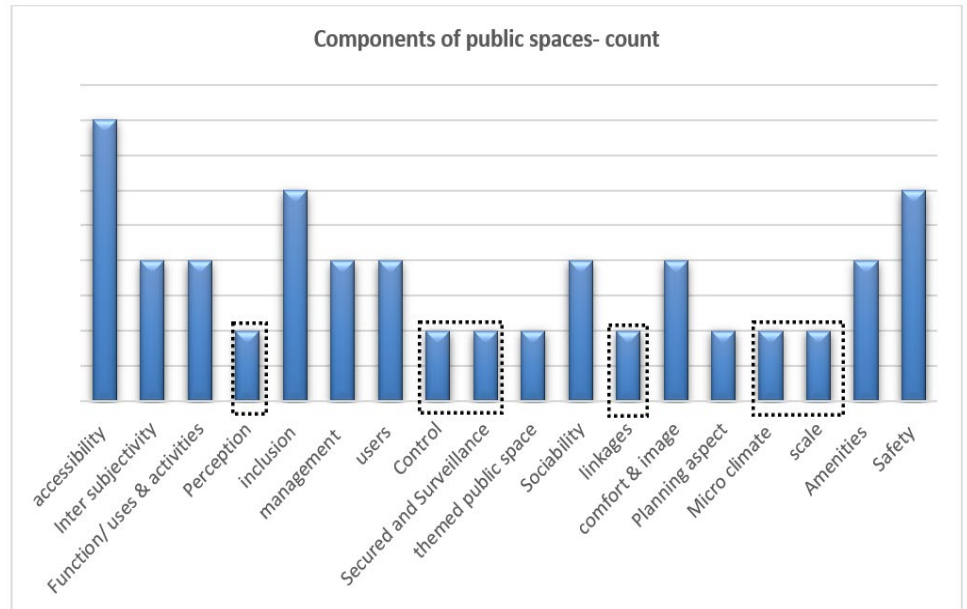
Figure 2 Work Done on Various Components of Public Space

5. CONCLUSION

The study reflects that components of public space development mostly emphasize on tangible components whereas exploration of intangible components like perception, women safety, gender ratio, engagement in and around the public space yet needs to be worked. The scope of work exits in tangible components like control, linkages, micro-climate, and scale, as very few research is done in this context. Also, the listed tangible and intangible components have minimum or no weightage in development/ evaluation indexes. The three C's i-e Concrete, cognitive and convivial for development of public space is proposed in the paper. Assigning weightage to dimensions can be taken as future scope of work. The public space development matrix cannot be generalized as it changes as per size, density, and culture of city. The theory of broken window, Maslow's Theory of Human Needs and Theory of Reasoned Action needs to amalgamate for formulation of components and subcomponents of public space.

CONFLICT OF INTERESTS

None.

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None.

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