
**Urban Voids with Nature-Based Solutions for Interaction of Social & Built Environment:
Case Study of Hayatabad**

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Abstract

This study was conducted to address one of the most common and very important aspects of urban dwellings named as the urban leftover spaces. These urban voids, usually considered as negative spaces, have great potential of being transformed into sustainable urban green, common neighborhood spaces. Primary objective of the study was to explore this hidden potential of these urban voids systematically and to strategize their transformation into livable and robust shared open spaces which may play the role of catalysts to bring the communities closer together. Design of the study was retrospective-prospective, supported by a series of local and international case studies. Procedure of the study included transforming urban voids into sustainable open space through meticulous design interventions. The outcomes of this study helped in not only setting a prototype for similar transformations in the future, but also provided guidelines for prospective researchers and development control authorities.

Introduction

Background of the Study

Rapid urbanization is one of the most difficult challenges faced by the policy makers throughout the globe. The definition of urban and rural though remained blurred in the history of Pakistan (Ullah, 2022), this however, does not negate or reduce the observable modifications in the living patterns of country's population. As a matter of fact, accelerated change in the urban landcover can very clearly be observed in all major cities of the world. Peshawar, being not an exception, is also going through this phenomenon, specifically, in the past twenty years. Agricultural land, barren land and clean water bodies have been swollen by the brown fields, leaving behind innumerable physical, infrastructural and environmental problems (Raziq, Xu, Li, & Zhao, 2016). Keeping aside the long term steady effects of environmental degradation caused by urbanization, the immediate revelation of carcinogenic and non-carcinogenic effluents mixed with the soil and waters of the local parks is one of the alarming hazards faced by especially the young and elderly dwellers of Peshawar (S. Khan, Munir, Sajjad, & Li, 2016).

Growth in the urban settlements can not always be condemned as it witnesses the availability of economic opportunities along with provision of commendable infrastructure facilities, but this

growth needs to be planned and oriented according to the future needs of the society. In case of Peshawar, there is no such planning activity visible on the canvases of both provincial as well as the metropolitan planning and development control authorities. It poses severe threats to the available lot of urban green open spaces (Rayan, Gruehn, Khayyam, & Health, 2022), which play the role of a common living space at neighborhood level.

Uncontrolled urbanization has resulted in the leapfrog development in most of the parts of the country including Peshawar and it always results in leaving behind urban voids and low-density spatial pockets (Akhter, Noon, & Sciences, 2016). The concept of urban design on the other hand is rarely been practiced in Peshawar. The only referable urban development plan in the city was the Structure Plan of Peshawar which was conceived in the second half of 1980s but could never be implemented completely and timely, leaving behind widely dispersed traces of ribbon and leapfrog development in the city. The concept of living streets was recently conceived to revitalize the most neglected yet important city of Khyber Pakhtunkhwa (AMAN, WAHEED, NAEEM, & SHAH, 2019), however, poorly conceived implementation strategies and lack of monetary resources have always proved to be hurdle in the way towards the development of a community friendly city.

The concept of site and services schemes was also introduced in Peshawar in the past to uplift the living standards of citizens but none of these could be materialized in their true spirit, eventually adding to the existing urban problems. One of these earliest schemes is Hayatabad which was initially proposed for middle income people with the concept of affordable healthy living. The scheme contains appropriate number of open and community spaces for the residents. Most of these open spaces were left undeveloped for later consideration, resulting in the creation of squatter settlements during Soviet-Afghan war of 1980s. After the fall of Soviet Union in 1989 and evacuation of refugees from the city during 1990s, many of these urban open spaces were developed and rejuvenated along with other green belts in the city (AMAN et al., 2019).

However, the accelerated increase in the traffic of the city after “War On Terror” during the first decade of 2000s, Peshawar needed the expansion of its road network including construction of flyovers, underpasses and elevated intra-city urban transport systems. This phase of urban upgradation added to the swatches of un- or under-developed leftover urban spaces throughout the city. Hayatabad being an important part of the urban boundaries also suffered from the phenomenon and these negative urban spaces became dump yards of waste instead of the green lungs they were supposed to be (M. S. Khan & Hijab).

Statement of the Problem

There are many leftover negative urban voids which are currently neglected yet contain great potential to become an important component of the Urban Design of Peshawar if transformed properly following the rules of sustainable urban development.

Objectives of the Study

The study aims at the realization that urban voids in the Hayatabad can be transformed into asset for the community if conceptualized as potential for urban common open spaces and developed into livable green neighborhood parks.

Research Questions

Following research questions were formulated for this study:

1. What is an urban void?
2. What is the relationship between urban sprawl and urban voids?
3. Can a planned urban scheme result in the creation of urban voids?
4. How can an urban void be transformed into livable community open space?
5. How can and to what extent the principles of sustainability be incorporated into the transformation of urban voids into urban assets?
6. How can the sense of ownership be developed in the vicinal community to reduce the maintenance costs of such neighborhood-level developments?

Limitations

Keeping in view the limitations posed by scarcity of monetary, human and time resources, the study was delimited to Hayatabad, Peshawar. It was further delimited to only two sites:

1. First selected segment starts from the beginning of Phase-VII Hayatabad to start of the Phase-VI.
2. Second selected urban segmented is from Phase-VI Bridge to Phase-II Bridge.
3. Third segment is from Phase-II Bridge to Thetara Park Phase-IV Bridge.

The detailed design was, however, proposed for one segment for the purpose of in-depth conception of the idea.

Significance of the Study

The study being prototype of its kind will serve as guideline for similar cases in the future. Countries like Pakistan having extremely limited resources, need practical and doable strategies for the transformation of their existing urban setups into sustainable futuristic livable neighborhoods. This study will help the planning and development control authorities of the country in transforming the byelaws into more human-friendly, pedestrian-oriented, sustainable and economical strategies to achieve user-centered responsive and robust urban built environments.

Literature Review

Urbanization

Researchers conceived at the start of twenty first century that most of the worlds population would be living in the urban areas by 2007 (Vlahov & Galea, 2002) and that the global planners needed to address the unforeseen needs of urban masses as predicted by these researchers. Urbanization comes at the price of eliminating forests, reducing agricultural lands and adding to the built-up brown areas. According to Berry and nature (2008), the process of urbanization is not static even within an existing setup. The population density continuously changes from high to low and vice versa with the passage of time depending upon the intensity of some governing factors. Countries and regions diversify in terms of industry, firms and work opportunities which is one of the factors regulating the urban densities. Land-use shift within a country or even within a city may cause notable changes in the propagation of urban population. Shift in urban density may result in the shift of urban facilities and infrastructure which were initially the cause of shift in density. The phenomenon being not very simple and predictable, may pose challenges in the way of policy formulation (Spence, Annez, & Buckley, 2008).

Urban Development and Sprawl

A city is the practical and dynamic manifestation of human activities on urban fabrics. City may expand, shrink or even abandoned depending upon the abundance or scarcity of economic opportunities. Urban development being also quoted as the synonym for urban growth, can be defined as the process of the expansion of an urban settlement in such a way that each and every additive unit in city expansion is planned, controlled and oriented by the policy makers and planners. Growth of a city is considered to be one of the live evidence of the livability of that city. It reveals that city still has to offer a lot to its residents and has the potential to welcome more in-migrants (Yigitcanlar, Teriman, & technology, 2015).

Urban Growth and Urban Sprawl

Although both the terms are related to the expansion of a city, but the former is praised for being positive and the latter is considered to be a curse for the city. Urban sprawl is the self-sorting of urban population usually ending in the lower urban densities (Nechyba & Walsh, 2002), requiring unsustainable modes for transportation for connectivity and intra-city movements. Some of the researchers (Brueckner, 2000) have worked out three evident causes responsible for the unplanned and unregulated urban spatial expansion including population growth being placed at the top, followed by rise in the household income and the last, a fall or subsidization in the commuting

Types of Urban Sprawl

In short, urban sprawl can be confined into three types:

- i. Concentric ring development or radial sprawl
- ii. Ribbon development
- iii. Leapfrog development

Whatever the form or type of sprawl it is, the consequences of the phenomenon are never considered to be human and environment friendly (Hao, Su, & Yu, 2013). It always ends in the low-density settlements with evident voids within a city.

Urban Voids

Urban voids are the leftover spaces in an urban settlement which are un- or under-utilized open spaces. These are, according to another definition, spatial swatches or usually negative spaces which are not utilized in urban facilities due to being either under an overhead bridge or being a natural seasonal passage for storm water, or even a steep chunk of land that can not accommodate any housing or civic building (Kushwah, Rathi, & Technology, 2017).

Potential for Sustainable Urban Design

Growing urban population, expansion of urban infrastructure and need for more community sharing spaces will demand the allocation of spatial segments to house and meet these future needs. In this scenario, the urban leftover spaces or urban voids may offer a significant amount of spatial assets to be converted into sustainable green open space acting as a catalyst for user-friendly urban design (Lee, Hwang, & Lee, 2015).

Potential Resource for City Development

According to Omar and Saeed (2019), urban voids can become a potential resource for city development in the circumstances when there is a need for the expansion of an existing facility. In this situation, an urban void can be utilized for this purpose in addition to providing relaxing spaces to the community. However, the need is to utilize these leftover spaces according to the standards principles and procedures of urban design.

Urban Voids and In-Between Landscape

Modern cities usually lack in providing sufficient landscape to the urban fabric and that is the reason that building facades, roof tops, and even the fronts of residential buildings are utilized for soft-scaping. In these circumstances, the urban voids are considered to be blessing in term that they provide discontinued, periodic and in-between landscapes in the cities.

Methodology and the Study Area

Research Design

It is a combination of retrospective and prospective studies. Retrospective in terms that it involves the study of a few cases in support of the design approach, philosophy and methodology, and, prospective in the term that it includes a design proposal for future incorporation along with a policy guideline for implementation and management. It involves the study of similar cases in the past as precedents, so one of its aspect is also a case study. Moreover, the selection of sample also invokes an aspect of case study in itself.

Population of the Study

All the leftover urban open spatial swatches constitute the population of this study. Total number of similar urban voids can not be counted exactly as the criterion for their inclusion or exclusion from the count depending upon their relevant sizes, location, surroundings, utilization and potential future use, being multi-faceted, can not be defined properly.

Sample and Sampling Techniques

Following details are worth-mentioning under this section:

1. Peshawar was selected as the focus of this study from all the cities of Khyber Pakhtunkhwa keeping in view the available resources including monetary, human, knowledge and time resources.
2. From all the existing urban neighborhoods containing significant amounts of leftover urban voids, only Hayatabad was purposefully selected for this study.
3. The selected neighborhood contained number of voids meeting the criterion of this study. However only three following segments were selected being purposive samples:
 - i. First selected segment starts from the beginning of Phase-VII Hayatabad to start of the Phase-VI.
 - ii. Second selected urban segment is from Phase-VI Bridge to Phase-II Bridge.
 - iii. Third segment is from Phase-II Bridge to Thetara Park Phase-IV Bridge.

Procedure of the Study

Following procedure was adopted in the conduct of the study:

1. Secondary data was collected from relevant area development authority office prior to the finalization of the neighborhood and the micro sites.
2. The neighborhood was visited by the researcher himself multiple times and the first hand information was gathered from the vicinal communities.
3. Selection criteria was discussed with the experts before finalizing the selection of sites.
4. Sites were finalized and primary data was collected including contours, site features, catchment areas, accessibility from various parts of the city as well as the neighborhood, mode of transport available, type of interaction to and from the sites etc.
5. Site was analyzed for SWOT and axes, and zoning was done accordingly.
6. Five-step design process was followed in the process including initiation, preparation, proposal making, evaluation and action.
7. After finalizing the design, implementation and management strategy was formulated to ensure community participation at each and every level of the project.

Study Area

Hayatabad was designed to be one of the sub-urban residential communities in Peshawar, the capital city of Khyber Pakhtunkhwa province in Pakistan in the late 1970s. It is primarily a residential scheme with an industrial estate at one of its edges to provide an accessible workplace to the residents.

Physical Features and Terrain

The neighborhood is sited over a relatively plain terrain with an evident gradient towards Hasan Garhi. There is a natural storm water passage running through Hayatabad, supported by a few small feeders but most of these secondary torrential water channels have lost their original shape and form due weaker development control approaches. Remaining natural water channel has been practically converted into waste disposal sites or dump yards by the community.

Flora and Fauna

A combination of conifers and wide-leafed flora can be seen in the area. There is no distinctive animal species or members of avifauna found in the area which could mark it exclusively from other vicinal cities or regions.

Climate

Siting mainly on the Iranian Plateau, Peshawar is located at the eastern end of the Khyber Pass. It is not situated in the monsoon region of Pakistan. Winter in Peshawar starts from the mid November and lasts till the end of March. It falls in the flood plains of Kabul River and Budni Nala.

Demographic Profile

The estimated population of Hayatabad is approximately 100,000 persons and the neighborhood is comprised of almost 11250 households. The local authorities are managing potable water supply through 53 tube wells dug at various points in the township.

Data Presentation, Analysis and Design

Data was obtained through secondary sources and through research tool, which was then tabulated, analyzed and a design solution for available urban voids was presented.

Occupancy Trends in Hayatabad

The available data in Hayatabad Development Authority was organized, tabulated and a trending diagram was created to reveal the occupancy rate and trend from the initiation of the township till 2011. Figure 1 and Figure 2 show the occupancy rate and trend from year 1980 to 2011.

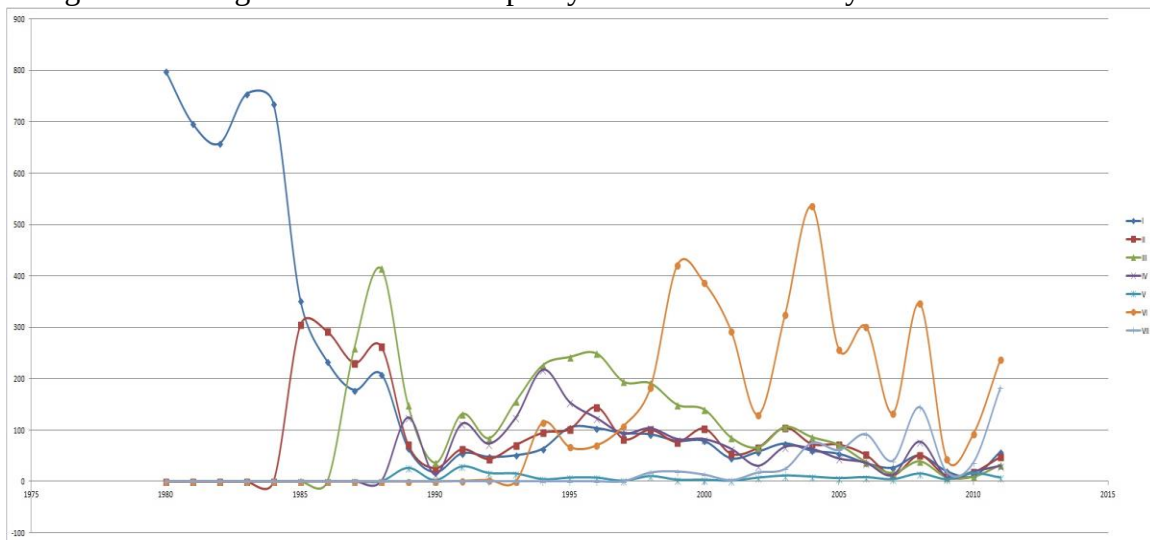


Figure 1: Trend in Plot Possession in Various Phases of Hayatabad from 1980 to 2011

Figure 1 shows the comparison in trends of occupation among various phases of Hayatabad. Phase – VI gained more popularity during years between 1998 and 2007, whereas phase – IV remained more consistent in this regard.

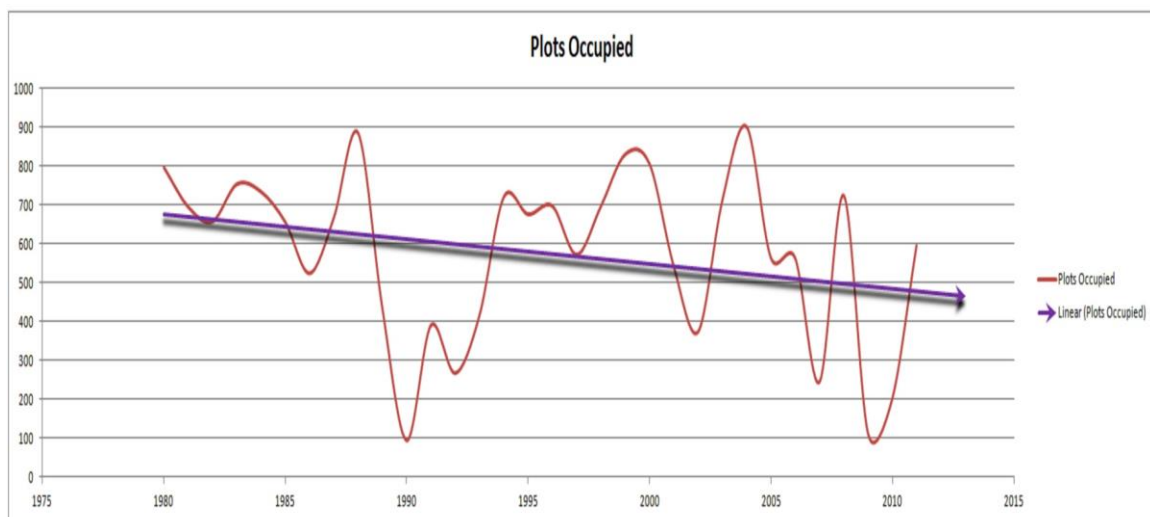


Figure 2: Trend in Plot Possession at Average in All Phases of Hayatabad from 1980 to 2011 and Onwards

Figure 2 indicates a gradual downwards linear trend in the rate of occupation of plots in all phases

of Hayatabad revealing saturation in the scheme. The linear trend line almost touches the zero level when projected till 2030, which means a super-saturation or fully occupied situation in Hayatabad.

Following tables reveal the status of occupants in Hayatabad Town including number of occupants per household, land tenure, the occupation of bread winner and current use of the plots.

Table – 1
Current Use of the Plots/ Units Surveyed (in Percent)

Plot Type	Current Use				
	Residential	Commercial	Educational	Amenities	Other
1 Kanal	100	0	0	0	0
10 Marlas	100	0	0	0	0
05 Marlas	100	0	0	0	0

Table – 1 reveals that all the plots surveyed in the study were being used for only residential purpose.

Table – 2
Tenure Status of the Plots/ Units Surveyed (in Percent)

Plot Type	Tenure Type		
	Owned	Rented	Other
1 Kanal	80	20	0
10 Marlas	65	35	0
05 Marlas	65.71	32.29	0

Table – 2 indicates that a higher trend of lending houses on rent prevails in smaller plot sizes whereas large houses are occupied by the owners themselves.

Table – 3
Origin of the Occupants Residing in the Plots/ Units Surveyed (in Percent)

Plot Type	Origin		
	Local	Emigrants	Immigrants
1 Kanal	50	50	0
10 Marlas	62.5	30	7.5
05 Marlas	51.43	45.71	2.86

Table – 3 shows that immigrants from other countries prefer to reside in medium size houses than in larger or smaller size.

Table – 4
Occupation of the Bread Winner in the Plots/ Units Surveyed (in Percent)

Plot Type	Employed		Self Employed		Other
	Public Sector	Private Sector	Business	Agriculture	
1 Kanal	50	10	40	0	0
10 Marlas	17.5	30	52.5	0	0
05 Marlas	14.29	42.86	17.14	11.43	14.29

Figures in table – 4 reveal that a great number of business community prefer to reside in medium size houses, whereas the occupants of larger houses are mostly employed in public sector

Table – 5

Number of Families and Occupants in the Plots/ Units Surveyed (in Average) Alongwith Average Monthly Expenditure (PKR) and Time (Years) in Hayatabad

Plot Type	Families	Occupants	Duration	Expenditure
1 Kanal	2.20	10.80	4.5	100500.00
10 Marlas	2.53	10.13	11.23	180812.50
05 Marlas	1.11	7.77	7.45	43800.00

Table – 5 shows that a relatively higher number of families per house live in medium size plots but average number of occupants is lesser than that of larger plots occupied by relatively lower number of families.

Table – 6

Descriptive Statistics regarding Number of Occupants in the Plots/ Units Surveyed in Hayatabad

	N	Mean	Std. Deviation	Std. Error Mean
Occupants	85	9.2353	3.55115	.38518

Table – 6 indicates that Mean and Standard Deviation of occupants per unit in the sample are 9.2353 and 3.55115 respectively, whereas standard error of mean is 0.38518.

Table – 7

T – Test Results regarding Number of Occupants in the Plots/ Units Surveyed in Hayatabad

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Occupants	23.977	84	.000	9.23529	8.4693	10.0013

Table – 7 reveals a calculated “t” value as 23.977 which is greater than the upper limit of 10.0013. The lower limit at 95% confidence interval was 8.4693.

Table – 8

Descriptive Statistics regarding Number of Families in the Plots/ Units Surveyed in Hayatabad

	N	Mean	Std. Deviation	Std. Error Mean
Families	85	2.0824	1.14655	.12436

Table – 8 shows that values of Mean, Standard Deviation and Standard Error of Mean are 2.0824, 1.14655 and 0.12436 respectively.

Table – 9

T – Test Results regarding Number of Families in the Plots/ Units Surveyed in Hayatabad

	Test Value = 0
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	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Families	16.745	84	.000	2.08235	1.8350	2.3297

Table – 9 indicates that the calculated “t” value was 16.745, whereas the lower and limits at 95% confidence level were 1.8350 and 2.3297 respectively. Mean difference in this case was 2.08235.

Opinion of Residents Towards Available Facilities

This section records the opinion of dwellers towards available urban facilities. The data was obtained through a questionnaire designed for this purpose.

Table – 10

Opinion of the Occupants (in Percent) towards the Status of Security in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	20	0	10	10	60
10 Marlas	17.5	65	15	2.5	0
05 Marlas	20	4.29	20	17.14	22.86
Cumulative	18.82	36.47	16.47	9.41	16.47

Table – 10 indicates that only 18.82% of the inhabitants of Hayatabad appreciate the status of security in the neighbourhoods. 16.47% of the inhabitants possess a quite opposite opinion about the status of security, whereas the percentage goes up to 60% when the residents of only larger houses are considered. 36.47% inhabitants term the level of security as satisfactory, 16.47% could not decide, and 9.41% consider it below average.

Table – 11

Opinion of the Occupants (in Percent) regarding the Vulnerability of Neighbourhood in Hayatabad towards Extruders and Passersby

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	90	0	10	0	0
10 Marlas	10	37.5	37.5	15	0
05 Marlas	25.71	14.29	25.71	22.86	5.71
Cumulative	25.88	23.53	29.41	16.47	2.35

Figures in table – 11 reveal that the inhabitants of larger houses are more satisfied with the current design of the neighbourhoods in terms of its vulnerability towards extruders and passerby. At a cumulative level, 25.88% consider its design excellent, 23.53% think it is satisfactory, a greater number i.e. 29.41% inhabitants opinion goes undecided, to 16.47% of the occupants the design is below average, whereas only 2.35% inhabitants consider it very poor.

Table – 12

Opinion of the Occupants (in Percent) towards the Level of Social Mixing between Neighbouring Families in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	70	20	10	0	0
10 Marlas	2.5	40	25	30	2.5
05 Marlas	5.71	20	28.57	31.43	8.57

Cumulative	11.76	29.41	24.71	27.06	4.71
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Table – 12 shows that only 11.76% people in Hayatabad think that the design of neighbourhoods is helpful in enhancing social cohesion among the inhabitants. A great number of dwellers i.e. 29.42% think it satisfactory. 27.06% opted for the below average option, whereas 24.71% people avoided to place their firm opinion.

As far as the residents of larger houses are concerned, 70% of the inhabitants consider its design excellent which is quite contradictory to the opinions of medium and small houses dwellers being 2.5% and 5.71% respectively.

Table – 13

Opinion of the Occupants (in Percent) towards the Availability of Public Transport at Walking Distance in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	60	0	0	0	40
10 Marlas	12.5	27.5	10	40	10
05 Marlas	14.29	5.71	20	25.71	28.57
Cumulative	18.82	15.29	12.94	29.41	21.18

Table – 13 indicates the status of public transport in Hayatabad, reporting only 18.82% residents considering it excellent. 15.29% think that the availability of public transport in Hayatabad is satisfactory, 12.94% could not decide, 29.41% consider it below average and 21.18% hold that it is very poor.

60% residents of larger houses consider that the public transport in Hayatabad is available at an excellent level. However, the remaining 40% hold a quite opposite opinion and consider it very poor.

Table – 14

Opinion of the Occupants (in Percent) towards the Level of Cleanliness in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	20	10	0	10	60
10 Marlas	10	47.5	15	15	12.5
05 Marlas	2.86	8.57	8.57	31.43	42.86
Cumulative	8.24	27.06	10.59	21.18	30.59

Table – 14 indicates that the residents of larger and smaller houses are more concerned about the level of cleanliness in Hayatabad and the percentage of dwellers considering it very poor was 60 and 42.86 respectively. On the other hand, only 12.5% residents of the medium houses are of the same opinion.

At a cumulative level, only 8.24% of the residents consider the level of cleanliness as excellent, 27.06% hold that it is satisfactory, 10.59% could not decide, 21.18% inhabitants rated it below average, and 30.59% are of the opinion that the condition of cleanliness in Hayatabad is very poor.

Table – 15

Opinion of the Occupants (in Percent) towards the Management of Solid Waste in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	10	20	10	10	50
10 Marlas	12.5	42.5	10	25	10

05 Marlas	5.71	11.43	2.86	25.71	48.57
Cumulative	9.41	27.06	7.06	23.53	30.59

According to table – 15, majority of the inhabitants in Hayatabad i.e. 30.59% are of the opinion that the status of solid waste management is very poor. 23.53% consider it below average, 27.06% hold that it is satisfactory, only 9.41% term it excellent, whereas 7.06% could not decide.

When viewed individually, 50% dwellers of the larger houses are of the opinion that solid waste management in Hayatabad is very poor, and 48.57% inhabitants of smaller houses also second their opinion.

Table – 16

Opinion of the Occupants (in Percent) towards the Condition of Public Sewers and Drains in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	80	0	10	10	0
10 Marlas	12.5	30	15	15	27.5
05 Marlas	2.86	17.14	0	22.86	51.43
Cumulative	16.47	21.18	8.24	17.65	34.12

Table – 16 shows a great contradiction between the opinions of larger house dwellers and other regarding the condition of public sewers and drains in Hayatabad. 80% of the larger house inhabitants term it excellent, whereas the number decreases to 12.5% and 2.86% when it comes the turn of medium and smaller house dwellers respectively.

Cumulatively, the numbers opting for excellent, satisfactory, undecided, below average and very poor are 16.46%, 21.18%, 8.24%, 17.65% and 34.12% respectively.

Table – 17

Opinion of the Occupants (in Percent) towards the Provision of Utility Services in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	90	10	0	0	0
10 Marlas	72.5	22.5	0	2.5	2.5
05 Marlas	80	8.57	2.86	2.86	0
Cumulative	77.65	15.29	1.18	2.35	1.18

According to table – 17, 77.65% of the inhabitants in Hayatabad term the provision of utility services at neighbourhood level as excellent. 15.29% consider it satisfactory, 2.35% below average, 1.18% very poor and 1.18% could not decide.

Inhabitants of larger houses are more satisfied with the existing conditions of utility services in Hayatabad and this number reaches 90%.

Table – 18

Opinion of the Occupants (in Percent) towards the Availability of Parks and Other Recreational Spaces in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	20	0	10	30	40
10 Marlas	30	30	17.5	17.5	5
05 Marlas	37.14	17.14	17.14	5.71	17.14
Cumulative	31.76	21.18	16.47	14.12	14.12

Table – 18 indicates that 31.76% of the inhabitants praise the recreational facilities available in Hayatabad, 21.18% consider it satisfactory, 14.12% are of the opinion that it does not fully meet the needs of inhabitants, 14.12% term it very poor, and 16.47% could not decide.

When viewed at individual level, 40% dwellers of larger houses hold that the available recreational spaces in Hayatabad are very poor. On the other hand, 37.14% residents of smaller houses term the recreational facilities as excellent.

Table – 19

Opinion of the Occupants (in Percent) towards the Rate and Vulnerability to Drug Addiction in the Neighbourhoods of Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	40	0	0	10	50
10 Marlas	40	17.5	20	20	2.5
05 Marlas	54.29	8.57	14.29	5.71	11.43
Cumulative	45.88	11.76	15.29	12.94	11.76

According to table – 19, 50% dwellers of larger houses consider that Hayatabad is more prone to drug addiction and its design in this regard is very poor. On the contrary, 54.29% inhabitants of smaller houses term its design excellent in this regard.

Cumulatively, the numbers of inhabitants opting for excellent, satisfactory, undecided, below average and very poor are 45.88%, 11.76%, 15.29%, 12.94% and 11.76% respectively.

Table – 20

Opinion of the Occupants (in Percent) towards the Availability of Appropriate Schools at Walking Distance in the Neighbourhoods of Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	80	20	0	0	0
10 Marlas	55	42.5	2.5	0	0
05 Marlas	80	5.71	8.57	0	0
Cumulative	68.24	24.71	4.71	0	0

Table – 20 indicates that the majority of inhabitants in Hayatabad is very satisfied with the schooling facilities for children at a walking distance. Occupants who opted for excellent, satisfactory and undecided remained 68.24%, 24.71% and 4.71% respectively. The dwellers of larger and smaller houses who termed it excellent were 80% in both cases, whereas 55% inhabitants of medium houses praised the facility. Not a single percent inhabitants in the scheme opted for below average or very poor.

Table – 21

Opinion of the Occupants (in Percent) towards the Availability of Health Facilities at Neighbourhood Level in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	100	0	0	0	0
10 Marlas	62.5	35	0	2.5	0
05 Marlas	74.29	17.14	2.86	0	0
Cumulative	71.76	23.53	1.18	1.18	0

Table – 21 shows that 71.76% inhabitants of Hayatabad term the health facilities in the scheme to be the excellent. Other 23.53% consider it satisfactory, 1.18% say it is below average, whereas remaining 1.18% could not decide.

100% residents of larger houses are of the opinion that the availability of health facilities in Hayatabad are their excellent level. In case of medium house, 62.5% residents consider it excellent, 35% are of the opinion that these are satisfactory, and only 2.5% rate it below average. As far as the residents of smaller houses are concerned, 74.29% term it excellent, 17.14% hold that these are satisfactory, whereas the remaining 2.86% could not decide.

Table – 22

Opinion of the Occupants (in Percent) towards Other Amenities (Mosque, Post Office etc.) at Neighbourhood Level in Hayatabad

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	60	0	10	10	20
10 Marlas	90	7.5	0	2.5	0
05 Marlas	80	8.57	0	2.86	2.86
Cumulative	82.35	7.06	1.18	3.53	3.53

Table – 22 indicates that 82.35% of the residents of Hayatabad term available amenities as excellent, 7.06% satisfactory, 3.53% below average, 3.53% very poor, and the remaining 1.18% could not decide.

Only 60% dwellers of larger houses praise the existing amenities whereas 90% and 80% inhabitant of medium and smaller houses respectively term these facilities to be excellent.

Table – 23

Opinion of the Occupants (in Percent) towards Overall Status of Hayatabad Regarding Condition of Facilities at Neighbourhood Level

Plot Type	Excellent	Satisfactory	Undecided	Below Average	Very Poor
1 Kanal	70	10	0	0	20
10 Marlas	70	5	5	5	15
05 Marlas	60	2.86	11.43	5.71	14.29
Cumulative	65.88	4.71	7.06	4.71	15.29

According to table – 23, 65.88% inhabitants of Hayatabad are extremely satisfied with the existing overall condition and design of the scheme, and only 15.29% wish for any other better scheme to reside in. Other 4.71% consider it satisfactory and a similar number of inhabitants term it below average. The remaining 7.06% could not decide.

Proposed Design for Urban Voids

An urban void comprised of natural water channel was selected for the purpose of transforming useless urban voids into livable neighborhood spaces.

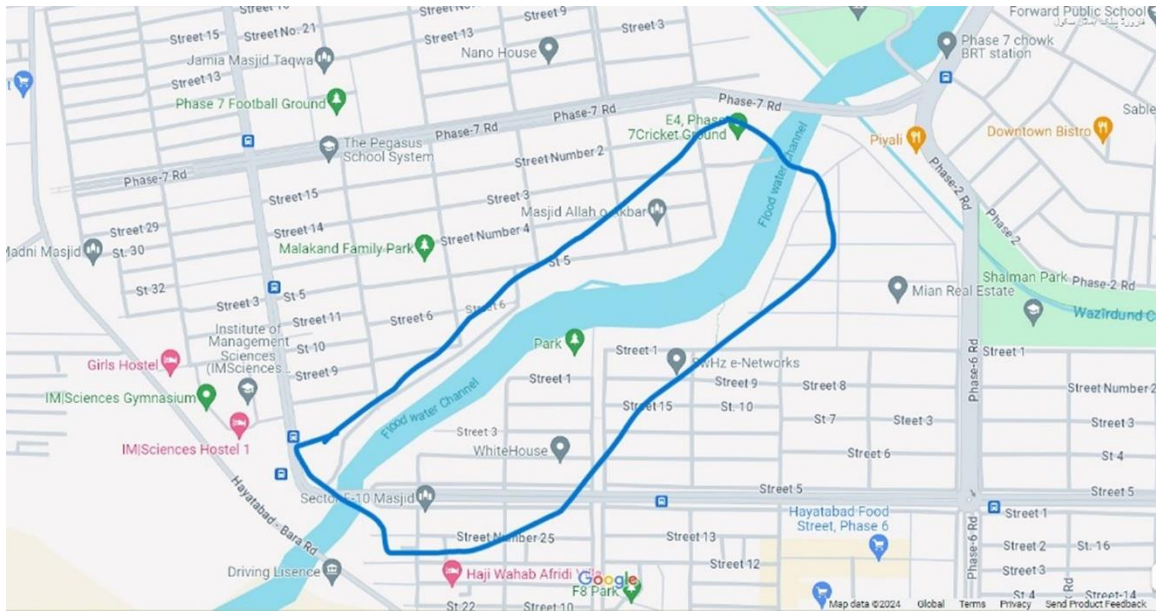




Figure 6: An Arial View of the Proposed Design Containing a Lake Being Used as Boating Site



Figure 5: Another View of the Proposed Design

Findings, Conclusions and Recommendations

Findings

A survey during the study revealed that Hayatabad will be fully occupied by the year 2030, however, that rate of possession of plots has almost reached the zero line, clearly revealing a tendency towards either saturation or static estate market in the area. It was also found that the density of the scheme has increased from the design density as number of occupants per plot are higher than the originally designed. The scheme was though meant to be one of the ideal residential schemes of the Province, but it could not maintain the standards of contemporary urban neighborhoods nor did it meet the expectations of the residents in the scenario of rapidly changing socio-economic infrastructure of the region. Despite of all these apparent drawbacks, a very few respondents opted to prefer any other residential scheme over Hayatabad.

Findings of the study can be summarized as follows:

1. Respondents of the survey revealed that the open spaces provided in Hayatabad do not suffice the needs of the residents. Moreover, there is shortage of maintenance staff for the cleanliness and greenery of these open spaces.
2. Safe accessibility to livable urban open spaces is another major issue of the scheme. There are no security measures provided for the safety and security of the users. Moreover, speedy traffic through the major arteries of the scheme bifurcate various residential blocks into impermeable sub-quarters.
3. The scheme does not provided privacy for women and families in the common open spaces of the scheme, which is one of the major repelling or push factor in keeping the families away from available urban open spaces.
4. It was also found that Hayatabad needs aquascaping in the form of wide spread water sheets which may also act humidifier and coolant for the micro environment of the scheme. Additionally, these water bodies may also play their role in providing excessive leisure spaces in addition to connecting the different phases of the scheme

Conclusions

This research study was aimed at finding the ways to convert the urban voids into sustainable livable urban open spaces through design interventions. The research culminated in the following conclusions:

1. The terrain of the scheme was originally undulating having a series of medium and small torrents furcating the entire schemes into segments. Many of these feeder streams have vanished and the remaining are in bad condition, practically converted into landfills due to lack of maintenance.
2. Some of the torrential water streams are perennial to some extent and can be converted into significantly large water bodies. This may help in retaining the water table to its normal level on one hand, and on the other hand, this may add to the positive side of the micro climate.
3. Large longitudinal water channels which are dividing Hayatabad into smaller parts, have the potential to be converted into connecting aquascapes in addition to playing their role in the preservation of indigenous flora and fauna.

Recommendations

In the light of the findings of the study and in the guidance of the conclusions driven from these findings, the researcher presents following recommendations:

1. The study has proved that there is a great potential of converting leftover urban voids into sustainable and lively shared neighborhood spaces. To achieve this, following strategies are presented:
 - a. Short Term Micro Level Action Plan
As an immediate remedial action, all the torrential water pathways should be cleaned and lined properly wherever needed due to future hazards of erosion or flooding. The plan may be documented, designs should be prepared in detail, all process in the implementation strategies should be completed, and plantation should be started immediately so that it may become mature till the next phase of action.
 - b. Long Term Macro Level Action Plan
It is suggested that dams should be constructed incrementally on all of these water channels to retain the floods and perennial waters for future use. These water bodies will have multi-faceted role in the further development of not only Hayatabad but the entire region as well.
2. It is also proposed that the importance of converting the urban voids into sustainable urban open spaces should reflect in the policy documents at micro and macro level.
 - a. Micro Level Policy Framing
Peshawar Development Authority should prepare a policy document under the guidance of architects and town planners of the country whereby all these water channels should be declared secured. Encroachment on these natural water channels must be dealt with iron hands. A fund must be established on the basis of contributions made by the community having a good share from the District Government as well. This fund should be utilized in the development of these water channels and subsequent micro-dams.
 - b. Macro Level Policy Framing at the State Level
There is a dire need for preparing policy document at provincial level involving all stakeholders and political bodies like IAP along with governing bodies like Urban Planning Unit. There should be a strategy clearly mentioning the preservation of such water channels and bodies in all schemes all over the province. The document should also reflect the management, implementation and maintenance procedures based on community participation to invoke ownership in the vicinal community.
3. Prospective researchers should be encouraged to conduct researches on similar topics of urban design and local area development preferably based on the principles of sustainable development and good governance.

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