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Evaluating the Environmental Sustainability of Walled City Lahore

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ABSTRACT

Adequate knowledge of Environmental Sustainability is essential to the success of its global efforts. A following study investigate the level of awareness of environmental sustainability in a developed city of Lahore, Pakistan. Data for the study was generated through the questionnaire's surveys across randomly selected adult inhabitants. Of the entire questionnaire, respondents responded according to their perceptions. Descriptive and inferential statistical analyses were conducted. Descriptive analysis showed that most of the respondents had the knowledge of Environmental Sustainability. It is recommended that information on Environmental Sustainability should be made available and be widely disseminated, especially its impacts and that international communities in conjunction with the national government should take charge of the control and of the associated risks. Further investigation is required to assess the strategies for coping and adapting to the effects of Environmental Sustainability in the area being studied.

INTRODUCTION

In the current era, development is moving with immediate speed, technology advancement is no doubt a blessing, but there are some challenges that are associated with unstable economic growth which influence well-being of people as well as environment. These issues are prevailing due to the dramatic urban development and knocking the doors of legislators, city planners and development specialist for the efficient management of city by adopting sustainable approaches. Much debates about the explanation of these terms (Gibson, 2006) likewise the rise of a surplus competing definitions for sustainability was observed (Robinson, 2004). This absence of compromise on the definition leads to its unclear and intricate meaning of sustainability (Evans & Jones, 2008), as it gave varied perception of sustainability to administrations and stakeholders. Though this ambiguity might look negative, Robinson (2004). The term Sustainability has been questioned many times on different platforms. Subsequently, nowadays, the definition of Brundtland (1987) report on "Our common future" has been extensively hugged by both public and private sectors.

Environmental Impact Assessment (EIA) tools which are at project scale were the 1st generation which commenced in the United States afterwards, the National Environmental Policy Act (NEPA) in 1969 was adopted (Shepard, 2005). EIA was established to discourse the growing pressure on environment, ensuing the economic and social revolution of the 20th century, which was augmented in scale and intensity right after World War II (Costanza et al., 2007), Moreover, the new concepts like Strategic Environmental Assessment for evaluation of Strategies, Plans, and Programs as well as Sustainability Assessment for evaluation of PPPs (Bond and Morrison-Saunders, 2011) were introduced according to (Therivel, 2004) in 1990s (Gibson et al., 2005). Similarly, building assessment tool introduced by UK that is "Building Research Establishment Environmental Assessment Method" (BREEAM) (Retzlaff, 2009, and Sev, 2011). The above illustrations specify that there are countless assessment techniques that focus on urban, regional development and even single building, though there is a deficiency of devotion, involvement and knowledge on the transitional level of city's neighborhoods argued by (Blum, 2007) "no single city can contribute to overall sustainability if its own component parts are found not to be sustainable"(Choguill,2008) In the current years, it has been admitted that the neighborhood is the scale at which land is developed by proposing new buildings, constructing and providing facilities (Benfield, 2010).

Research Objectives

Following are the specific objectives of the research

- To identify the reasons for significant deviations in achieving Environmental Sustainability in the neighborhoods.
- To find out the perceptions of the residents regarding their quality of life and to asses either the areas are environmentally sustainable or not.
- To summarize complications and challenges, for implementation of Sustainability to improve the effectiveness of Sustainability parameters.

Relevant Studies

Half of the humanity resides in urban settlements and this number will proliferate up to 70 percent by 2050, inserting extra burden on present social infrastructure (EIU, 2012). Subsequently, meteoric urbanization is a prime trepidation due to its deleterious impacts on natural environment vis-à-vis energy crises, water shortage, air pollution, deforestation, global warming, and degradation of prime agricultural land (Haapio, 2012; Luederitz et al., 2013; Roseland, 2013). Presently, urbanization is contemplated as social dilemma, which is a menace for the sustainable development of human neighborhoods and districts. Likewise, rapid population growth coupled with an economic shift from agriculture to industrial sectors is major sources of inimical development (Yildiz et al., 2016).

Neighborhoods are considered as main building blocks of urban settlements and attributed as primary unit of planning and designing sustainable cities and communities (Sharifi et al., 2012). Endorsing the significance of the neighborhood as battlegrounds to combat unsustainable practices (Choguill, 2008). Across the world, several countries have initiated sustainable neighborhood drive to make their cities and urban settlements liveable and sustainable by adapting to the environmentally friendly practices. Sustainable human settlements are those where socioeconomic gains are integrated with sustainable use of water, energy and other domains of natural environment. Presently, several assessment tools are developed to measure and gauge the sustainability of individual building and neighborhoods to large metropolitan cities. These assessment tools are created on the accreditation of the neighborhood buildings as smart, green and eco-friendly. Further, sustainability assessment tools measure sustainability of neighborhoods by evaluating the sustainability of the environment and sub sectors of environment like building designs, land use allocation system, transportation network, water usage, air quality, energy production and usage mechanism.

Environmental Sustainability in Urban Areas

In urban planning, the supposition of the principle of sustainability indicates the adoption of urban development models that can understand the requirement for resource depletion and environmental impact reduction. In industrialized nations, this has primarily led to the development of so-called “compact cities”, which are considered to be the opposite of urban expansion (Neuman and Indovina, 2008). This phenomenon was characteristic of urban development in the last century and is currently considered not. Sustainable. High consumption of soil, urban congestion, increasing cost of infrastructure and fading health are just some of the effects of urban expansion. High-density development may have a negative impact on the quality of the built environment such as higher traffic congestion and higher levels of air and noise pollution, create conflicts between landuse. This is one of the reasons why many European and North American countries are affected by the proliferation phenomenon. It is characterized by the migration of richer populations to the suburbs, ensuring a higher quality of construction and quality, making the poorest population denser and less liveable. The area has old and low-quality buildings. Therefore, the promotion of a compact urban model within the framework of sustainable development means strengthening intensification policies that join the quantitative concept of density with the parameters and requirements that guarantee a high quality urban structure (Gibelli et al., 2010) in other words The density should be understood by considering the current and future scenarios based on the environmental and social conditions of the site, in order to calibrate the intervention based on the background's spare capacity and the chances of improving the condition of the urban environment. Within this framework, the densification policy should strengthen the sustainable development process and aim to raise the condition of the built environment.

Environmental Sustainability in Pakistan

The united nations Conference on Environment and Development (UNCED) which held in Rio de Janeiro,1992known to be "Earth Summit" whose aim is to help shaping policies and work for prosperity at global level, it aim to lessen poverty, improve social equity, protecting environment and to control haphazard development for this purpose sustainability was kept at center stage, Pakistan being a developing country is also facing environmental hazards/problems that include lack of awareness among community, mismanagement of water and other resources, badly planned urban areas which is also rising industrial expansion. Air pollution, scarce water supply, poor sanitation, agrarian soil degradation, deforestation and rangeland deprivation are other central environmental defies we are facing. In response to these issues, policies related to environment and climate change were initiated and many are nowadays, funded by Federal, Provincial and Local Governments to increase the capability of institutions and organizations to deal with environmental loss/degradation.

- PEPA Act provides guidelines for the protection, preservation, restoration/ rehabilitation and development of the environment, for the inhibition and control of pollution, and promotion of sustainable development (PEPA,1997)
- Many projects are in implementation phase which addresses policy measures such as to develop sustainable management of land to resist desertification in country institutions like (Global Change Impact Study Centre, Clean Development Mechanism (CDM) Cell, National Conservation Strategy Resource Center, National Multilateral Environmental Agreements (MEAs). Secretariat Program, National Awareness campaign on Energy and Environment Conservation, National Bio-safety Centre and many others are established.
- The International organization/Union for Conservation of Nature along with other associates are conjointly trying to implement National Impact Assessment program (NIAP) in Pakistan. The program aims to contribute towards sustainable development in Pakistan through strengthening the Environmental Impact Assessment and introducing Strategic Environmental Assessment (SEA) in national development planning. The NIAP is a unique initiative, which intends to use a multi-pronged strategy to improve effectiveness of EIA and introduce SEA in the country.
- PEPA has also advised Tyre Derived Fuel (TDF) as well as Refused Derived Fuel (RDF) strategies to protect energy and safe utilization of alternate resources of energy and environmental pollution in Pakistan.
- National Sustainable Development Strategy (NSDS) has been formulated and finalized by the Ministry of Climate Change in consultation with a variety of stakeholder groups to achieve goals of sustainable development through climate-resilient interventions. NSDS addresses the challenge of establishing the quality of the environment as a public good and highlights the role of State in its protection and improvement along with other stakeholders.

The Government of Pakistan recognizes the environmental concern and taking necessary measures to combat environmental degradation effectively. This chapter encompasses air and water pollution, solid waste, forest, biodiversity protection issues being faced by these sectors and strategic goal (envisaged in National Sustainable Development Strategy). Significant initiatives have been taken to counter all the complex issues responsible for environmental degradation. It is hoped that these measures will yield desired goals.

Research Design

The study relies on qualitative and quantitative approaches in collection and analysis of data based on environmental sustainability assessment checklist, field inspections and review of past studies. The quantitative method was used to illustrate the results in figures/quantities whereas the qualitative method is espoused to define the thoughts of inhabitants of designated areas. Primary and subordinate sources were referred to assemble the relevant data. This research study follows a quantitative data collection mode to observe the resident's perspectives. The data collected from surveys were then inferred by using statistical and descriptive analysis. Lastly, experimental analysis techniques were applied to additionally analyze the facts and figures and summarizing the core features of the data set.

Selection of Case Study Area

Historic and old structures were conventionally designed with a lot of sustainable features that respond bravely towards the climate. Once

efficiently restored and recycled, these features can fetch about significant energy reserves.

Considering historic buildings and structures original climatic adaptations, today's sustainable technology can increase inherent sustainable characteristics of buildings without compromising inimitable historic character. Maintenance and Conservation retain our land's history and culture thriving and we learn much from the approaches and practices of those who came before us. Besides it, because of our threatened environment and depletion of resources, it is imperious that we make sustainable living a part of our daily lives. The community benefits of both preservation and sustainability are very clear and should work together. Reviewing the current form of better interpretation for the social standards and environmental benefits of conserving historic structures will be a good start.

The Walled City of Lahore covers an area of 256 ha with a population of 200,000.The Walled City of Lahore also known as Old City, forms the historic core of Lahore, Pakistan. The city was established around 1000 CE in the western half of the Walled City which was fortified by a mud wall during the medieval era. Unplanned and unintended commercialization persisted to be a very immense issue of the Lahore city as the most of the city's residential zones specifically inside the Walled City have been transformed into commercial zones. It not only damages the city's old infrastructure, architecture, but has also given birth to traffic congestion, amplified pollution by producing more vehicular movement. This research study will address the environmental issues of Walled city and will apply assessment tools to them.

Calculating Sample Size

Population of Walled city (Bhatti Gate) = 36533

By applying Slovin's Formula:

$n = N / (1 + Ne^2)$

Confidence Level

e= 100 % - 95 % = 5% = 0.05

n =36533 / 1+ 36533 $(0.05)^2$

= 36533/ 91.335

= 399.95≈400

Population of Walled city (shah Alam) = 28711

= 394.5≈400

Data Analysis

Data Analysis is the process of systematically applying statistical and/or logical techniques to describe and demonstrate, concentrate and evaluate data. The data that was collected from all the sources, primary and secondary, official or field survey and user's perception survey, is analyzed at this stage. In this step, all the data collected from different ways are combined to show results. Following type of data analysis methods were used.

Quantitative Data Analysis

Quantitative analysis involves the techniques by which the researcher converts data to numerical forms and subject them to statistical analyses. The Performa's and questionnaires used for survey and user perception survey were analyzed quantitatively. Accordingly, the collected data is classified in an explanatory way with help of frequency tables and graphs. Sustainability ratings were derived for both study areas after detail data analysis. Reliability analysis is carried out to find out the internal consistency of the factors selected which are responsible for bad environment within the areas.

Examining the Reliability of Variables by Cronbach's Alpha

A research analyst must deploy a rational, authentic, and proven test and use a well-designed questionnaire to convey accurate assessments and interpretations regarding social issues (Mohsen Tavakol and Reg Dennick, 2011). Another domineering scale that the Cronbach's alpha is a Likert scale which uses a questionnaire for respondent's response and is widely used for determining the reliability and internal consistency of the test and scale. Range 0 to 1 is the typical value of the Cronbach's alpha and it assumes that internal consistency exists amongst indicators if its Coefficient is near to 1.0(George and Mallery, 2016).

The table 4.3 shows the value of cronbach alpha whose value is above 0.7 and the number of items selected.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.731	.738	27

The correlation coefficient is used to assess the degree of reliability. The test is reliable as it shows a high positive correlation with value of 0.3. A researcher is expected to consider the relevance and quality of a chosen instrument on which the research questions are formed (National Research Council Committee on Scientific Principles for Educational Research, 2002). Conventionally, quality can be understood in

terms of notions like validity (the range to which an instrument measures what it claims instead of something else) and reliability (the range to which an instrument is considered to give the exact measured product when measurements are repeated) (Taber, 2013).

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Environment sustainability is necessary to achieve for development of city?	64.56	101.946	.275	.499	.723
Water supply is not proper in the area	63.88	96.612	.389	.632	.714
Clean water is not Accessible in the area	63.80	95.111	.468	.521	.708
Area must have treatment plant for clean water	64.42	100.610	.306	.315	.721
Sewerage system of area is adequate	63.47	105.868	-.026	.510	.741
Proper disposal of waste is carried out in area	63.40	110.848	-.239	.671	.756
Discharge of waste is done on daily basis	63.22	107.143	-.087	.683	.748
Septic tank is regularly disposed by authority members?	63.20	107.475	-.099	.382	.746
Waste is burned in place near to your home?	63.41	104.083	.044	.493	.738
Waste is disposed on roads randomly?	63.74	96.518	.400	.518	.713
Area have poor drainage system?	63.91	96.527	.417	.559	.712
Traffic congestion is faced in an area?	64.22	97.850	.388	.534	.715
Uneven Noises cause disturbance in daily life?	64.19	98.398	.303	.512	.720
Air pollution is causing many diseases?	64.77	100.967	.360	.564	.720
Water stayed on roads after heavy rain?	64.19	94.741	.506	.634	.706
Neighborhood Parks are accessible?	63.82	106.351	-.054	.377	.745
Factories are near to residential areas?	63.73	100.846	.207	.569	.726
Green and healthy environment plays a major role in development of area?	64.81	104.014	.106	.530	.731
How would you rate Law enforcement	63.39	95.957	.403	.733	.713
How would you rate Neighborhood Security	63.45	97.301	.359	.628	.716
How would you rate Garbage collection	63.63	97.387	.308	.761	.719
How would you rate Roads/highways/ streets	63.38	97.450	.378	.749	.715
How would you rate Parks and recreation	63.63	97.448	.344	.634	.717
How would you rate Sidewalks/ pedestrian Safety	63.70	94.717	.394	.712	.712
How would you rate Storm drainage	63.93	94.530	.519	.639	.705
How would you rate Street lighting	63.45	95.745	.404	.641	.712
How would you rate Outdoor activities	63.72	95.638	.391	.676	.713

INTERPRETATION

One of the most important and inescapable statistics in research is Cronbach's alpha which involves a test construction (Cortina, 1993) and is used to the extent that it is considered a routine in any typical research with multiple-item measurements (Schmitt, 1996). Nevertheless, the reports of the development are included in the literature which tests the knowledge and understanding of the student that city Cronbach's alpha as an indicator of instrument quality.

Waste generation, collection, availability of septic tank, water supply, pollution, availability of Parks and recreational spots all the factors are highly correlated which means they all contributes towards the environmental condition of the area.

PERCEPTION OF RESIDENTS

Changes in the environment are not only recorded by advanced technology but also perceived by the individual. Environmental perception has been adopted as a diagnostic tool since the UNESCO's Man and the Biosphere program of 1968, which declared the study of environmental perception as a fundamental tool for the management of places and landscapes (UNESCO,1968). It is an advantageous tool for

diagnosing socio-environmental issues and inter-linkages (Whyte, 1977). Studies have shown that perceived changes in the environment are instrumental in policy design and sustainable resource management (Ayeni and Olorunfemi, 2014). Even though environmental perceptions may be categorized as subjective judgments because they are not based on scientific quantitative methods– they are highly important due to the incorporation of factors other methods neglect (Elliot, 1999). Individual characteristics affect perceptions, but they also affect the individual's actual food and water availability and consequently matter in terms of necessary political action (Eduful., 2015)

Availability of Clean Water

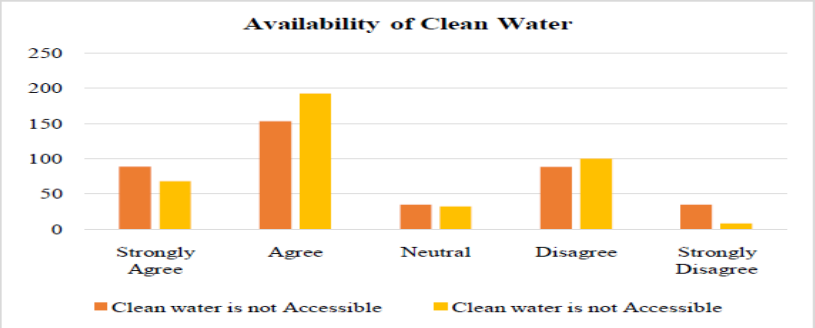

Figure1.

Source: *surveyed by author*

As the condition of utility amenities is far deteriorated, the pipelines for clean water supply are full of rust. The figure 4.1shows that majority of the respondents agree with the unavailability of clean water. On the average, 95.111% responses are recorded which states in the inaccessibility of clean water at Shah Alam and Bhatti Gate localities.

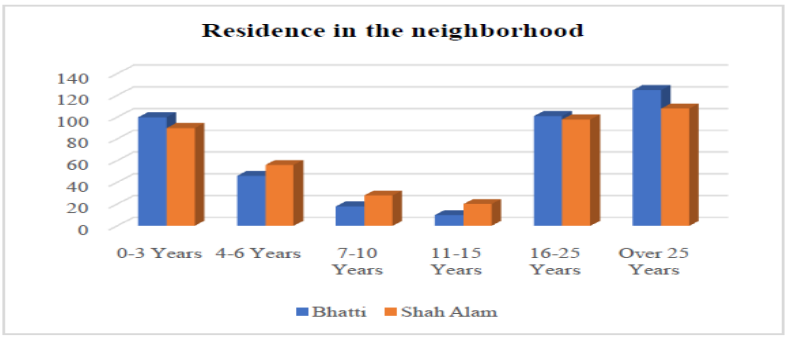

Figure2.

Walled City is basically the notable area of Lahore which is now old city Lahore. Before Indo-Pak separation, this area was the hub of the central market place adjacent to residential areas. Still, there are many families living here before the independence of Pakistan. As shown in figure 4.2 people have been living here since many years. The remarkable percentage of respondents have been living in Shah Alam and Bhatti Gate areas for more than 25 years. This makes the area historically rich.

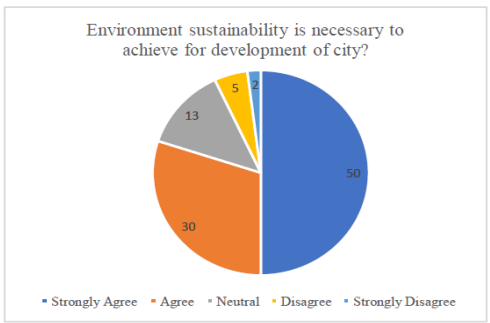

Figure3

The fundamentals of a city development utterly rest on sustainable factors within the city. Carbon footprints, economic, environmental, infrastructural, agricultural, and societal changes are the topmost elements that make the city run on the treadmill of higher development ends. (Hamed and Mohsen, 2015) environmental sensitivity is the central point around which the model of urban sustainability develops. It is one of the most significant pillars over which a developed city grows. Henceforth, a vast number of people are strongly agreed in the development of the city based on environmental sustainability. 50% of the population of case study area strongly agree that environmental sustainability is necessary to achieve development of neighborhood

SEWERAGE SYSTEM OF SHAH ALAM

Table1.

	Frequency	Percent
Strongly agree	32	8.0
Agree	156	39.0
Neutral	92	23.0
Disagree	100	25.0
Strongly Disagree	20	5.0
Total	400	100.0

Source: *Surveyed by author*

In the commercial area of Walled City, overall sewerage system is deprived. The underprivileged area does not even meet the least standards of the sewerage facilities. There are open dumps, the improper system of disposal, and no proper discharge of effluents with proper sanitary channels. Shah Alam market is blatantly deficient with the proper sewerage system with no appropriate system of disposal. 39% of people are agreeing with the improper sewerage system of Shah Alam area as shown in table 4.5

SEWERAGE SYSTEM OF BHATTI GATE

Table2.

	Frequency	Percent
Strongly agree	50	12.5
Agree	117	29.3
Neutral	116	29.0
Disagree	91	22.8
Strongly Disagree	26	6.5
Total	400	100.0

The condition of residential areas in all over the Walled City Lahore is deficient with a proper sewerage system. The latrine channels discharge uncovered which runs alongside the dwellings' boundary in major part of the area. There is a minor difference between the neutral and agreed responses in the condition of the sewerage system in Bhatti Gate. By and large, open dumps and seepage discharge has no proper means of treatment before the final discharge in the soakage pit.

Figure4.

The downtown area of Lahore is full of timeworn methods to collect waste through the residential and commercial nodes. As the streets are narrow, hence waste transport can only go in some areas. Whereas, there are still those old fashioned manual work is used which has been discarded a long ago in other parts. The comparison of residential and commercial stats clearly shows that people are not satisfied with the proper collection of waste in their respective areas.

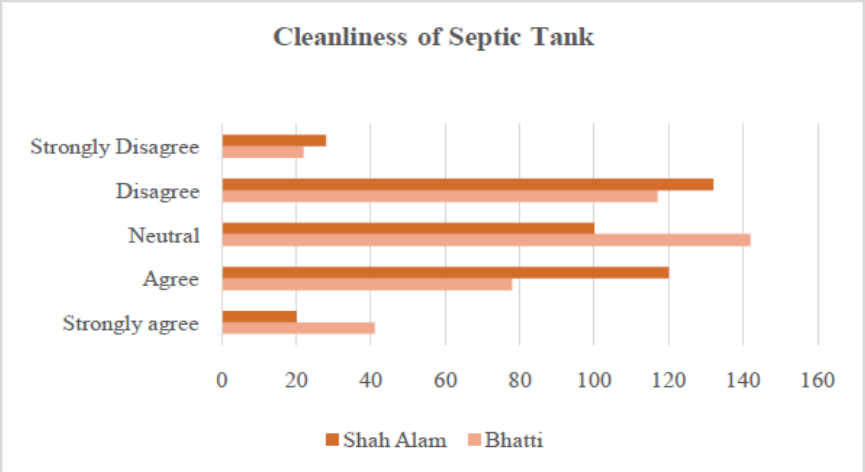

Figure5.

There are underground septic tanks in the walled city which are more of the deteriorated conditions. The sweepers are called upon when the people consider making it clean. However, there is as such no proper on-time cleaning by the local department. Respondents of the Shah Alam market are disagreed with the method and time management to clean septic tanks while a vast proportion of the respondents in Bhatti Gate give a neutral response.

Table3

	Frequency	Percent
Strongly agree	32	8.0
Agree	115	28.7
Neutral	88	22.0
Disagree	105	26.3
Strongly Disagree	60	15.0
Total	400	100.0

Usually, inhabitants burn the waste in their terraces whereas people living in Bhatti Gate responded that the masses are burned near their dwelling units. As the overall system of collecting and disposing of waste is full of old slack methods henceforth the treatment of waste does not pass through the proper channel to discard the toxic waste and all the waste are burned together near dwelling units.

Table4

	Frequency	Percent
Strongly agree	72	18.0
Agree	152	38.0
Neutral	80	20.0
Disagree	84	21.0
Strongly Disagree	12	3.0
Total	400	100.0

As stated above, walled city is the ancient Lahore with old fashioned methods of living and trading. People dispose of waste at the open dumps of streets and roads. There are fewer numbers of disposal barrels and a large number of trash piles at the corner of each road. Respondents are agreed that there is not an allotted dumping station to dispose-off hence people throw waste randomly on roads.

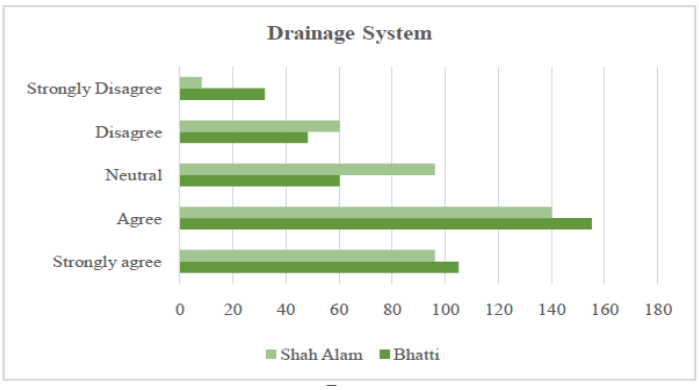

Figure6.

A drainage system is the image of an area which needs to depict a clearer look of the overall draining structure. Most of the drainage systems in walled city are oddly constructed with no proper check and maintenance. This leads to the malfunctioning of wastewater removal from the areas. People living in Shah Alam and Bhatti gate are agreed that there is no upright condition of drainage infrastructure which leads to the community involvement in the cleaning and maintenance of the drainage system.

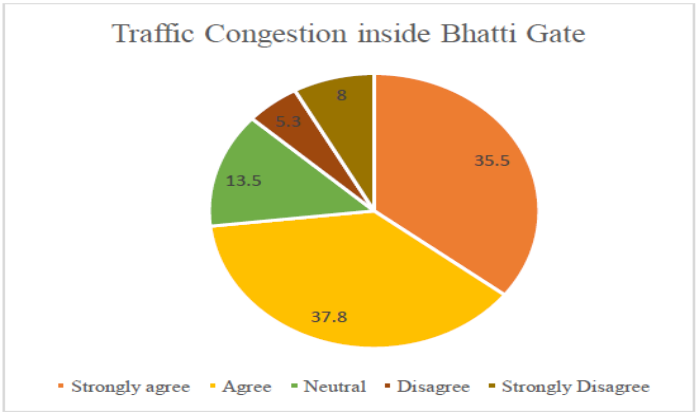

Figure7.

Traffic condition is enough troublesome in entire Lahore city especially when it comes to the narrower roads and streets. Bhatti Gate has a maximum 30-40 ft. wide roads while the streets are 8-15 ft. only. This creates a drastic condition when the peak hour come. People of Bhatti Gate experience traffic congestion large time of their day and it becomes heftier when a loader of heavy vehicle passes by. Most respondents are agreed that there is intense traffic congestion in Bhatti Gate.

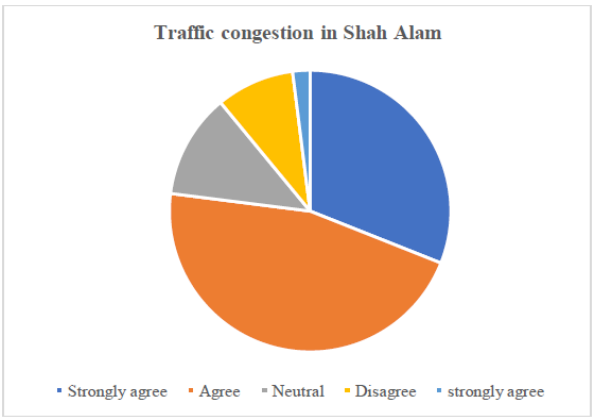

Figure8.

Markets are always full of people and it becomes more severe when it comes to less widened areas. Being the focal point of sale and trade, Shah Alam faces absurd stagnant of

traffic for hours during peak hours. Whereas the situation during the normal routine is still pathetic. Additionally, traffic management is absent in some places which add to the cluster in the traffic. People working in Shah Alam are agreed against the traffic congestion in the area.

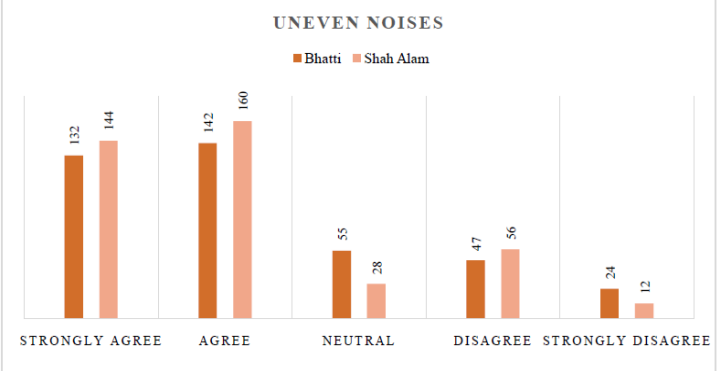

Figure9.

As the area is congested and most populous with uneducated persons who blow horns and play music on loudspeakers stridently and unconditionally. This creates intense noise pollution within the areas. Any person coming outside finds it quite troublesome to drive under the shed of loud noises. Besides the minor difference between the number of people agreed and strongly agreed about the availability of uneven noises in their areas, the noise overall condition is alarming.

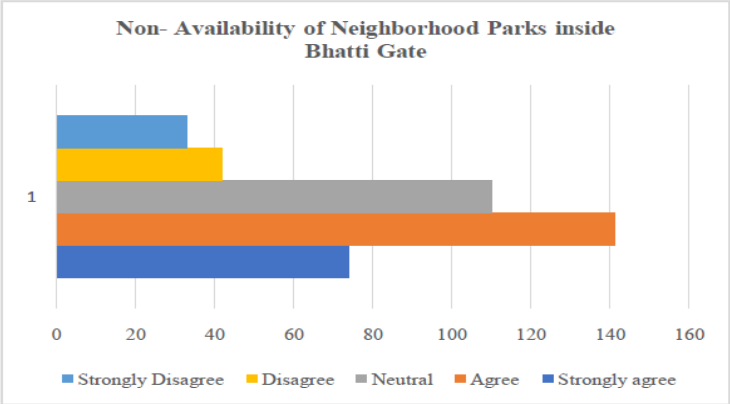

Figure10.

Walled City area was developed before Indo-Pak separation when there was no segregation of plot sizes. There are 1 Kanal plots are adjacent to 5 Marla plots and only rich has private gardens and parks inside their property. This made the need for commonly shared neighborhood parks less. Till now, the area is not developed much and there are few neighborhood parks in the whole walled city. The graph clearly shows that respondents are agreed that there are not sufficient parks available inside Bhatti Gate.

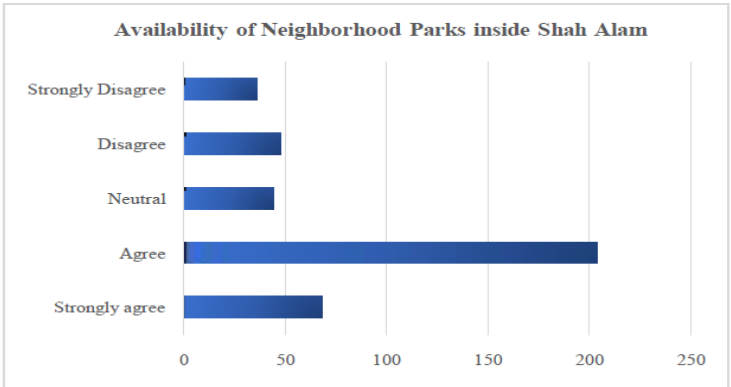

Figure11.

The concept of parks and gardens in the commercial are is prevailing these days which was uncertain a decade before. Being the old commercial hub, the focus of Shah Alam development was on the construction and expansion of markets which never include green spaces as an integral part of planning. This can be seen today as the number of parks as expressively low inside Shah Alam. A sharp number of responses can be seen through the graph stating that people are agreed about the unavailability of parks.

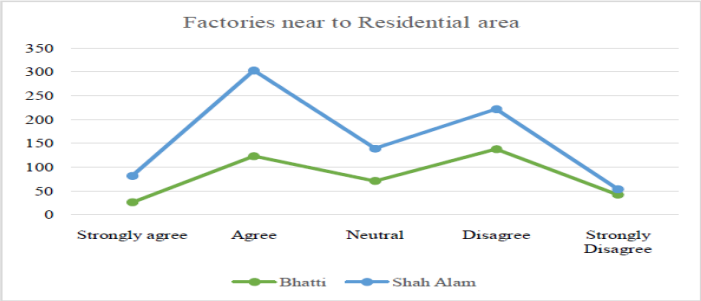

Figure12.

The unplanned areas of Bhatti Gate and Shah Alam are full of mismanagement and malfunctioning of the local authorities and governing bodies. As the segregation of land uses are difficult to perceive, the ubiquitous mix of land uses can be seen from the start till the end of the area. Residential-cum-commercial is the most common land use type find in both Shah Alam and Bhatti Gate area. There are factories running beside the dwelling units even some of them are running on the ground floor or in the basement of the dwelling units. People living in the Shah Alam area used to give their property on rents at the ground floor and basement levels being residents on the upper floors. However, residents of Bhatti Gate responded that there are factories running in their streets for which no governing body do anything to regulate them.

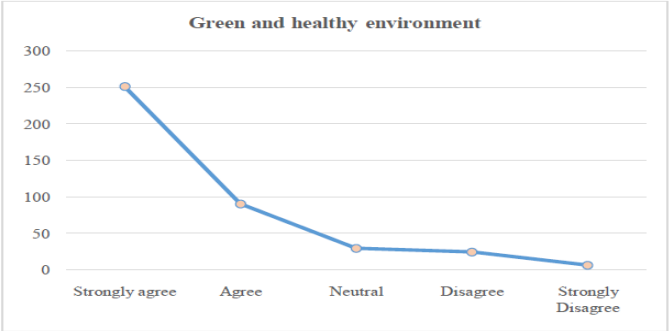

Figure13.

The first notion that comes in mind about the Walled City Lahore is about its historically and architecturally significant buildings of the Mughal era. This built-up area has more tiny dwelling units and least or no green fields in some of the areas. Noise level, pollution, and health conditions area drastic in the area. There are garbage drums and signboards hamper the beauty of the area. A clear mark can be seen in the graph shows that people are strongly agreed with the unavailability of a green and healthy environment in Shah Alam and Bhatti Gate.

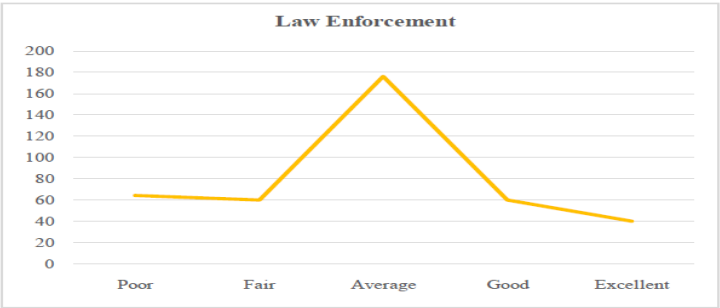

Figure14.

The governing bodies and law enforcement agencies are inactively operational in the areas. People are violating laws and regulations immensely on an hourly basis which makes challenging to streamlining of laws. Law enforcement agencies are working in some areas highlighted by the higher governments. But, on the lower level, the condition is alarming. Henceforth, people have neutral views about law enforcement in their area.

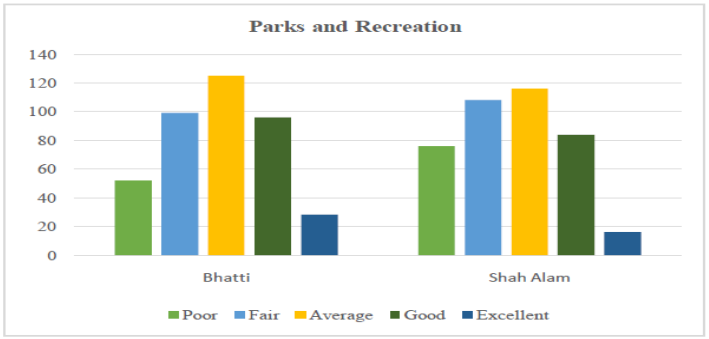

Figure15.

Parks and recreation facilities are the integral part of a neighborhood which amplifies the overall health. All the parks and recreational facilities are getting built on the major point in Lahore. Walled City Lahore is congested enough that the availability of any recreational facility is simply difficult to accommodate when people are suffering from huge space problems. Henceforth, respondents gave average remarks against the availability of parks and recreation facility in their respective areas.

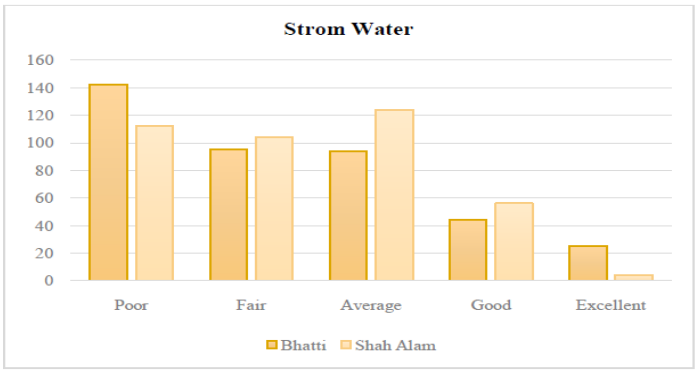

Figure16.

Rain and storm water harvesting has quite potential in water sustainability. Walled City is comparatively upper area than other parts and there is no proper drainage for collecting and storing rainwater, hence either all the water flush off through the sewer channels or run off to the lower areas. Both, at Shah Alam and Bhatti Gate, has poor storm drains and people use their buckets to collect rainwater for their own purpose. The community does not do anything to stock storm water for any purpose.

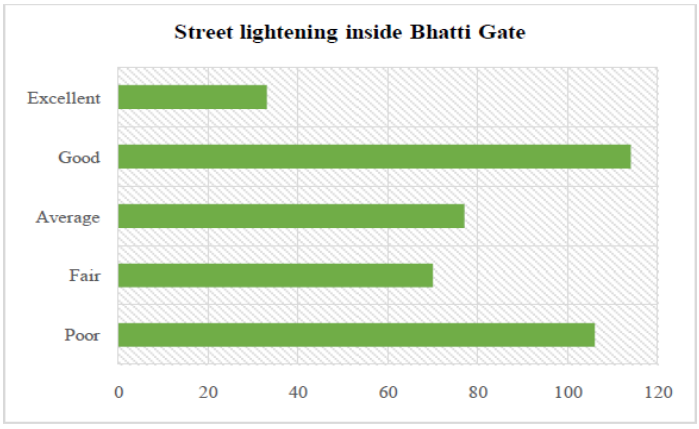

Figure17.

The streets and roads are narrow and only one bulb illuminates the whole street. Another point is that people stay late at night and work at later hours as well which also lower the demand for more street lights as they use their own light bulbs. Henceforth there is no much need to add more lights. As far as the current situation is concerned, people are happy with the availability of lights and rank it "Good" inside Bhatti Gate.

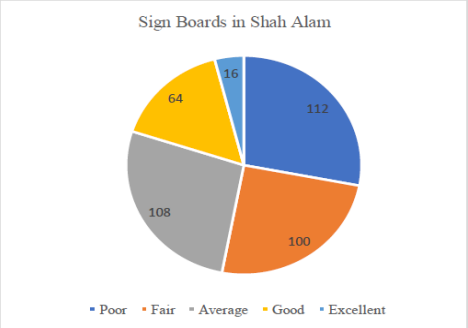

Figure18.

Signboards as the significant element in detailing and marking the top nodes. Shah Alam is full of signboards yet most people still do wall chalking and banners to advertise something. There is a slight difference in the views of people about the rating of signboards in Shah Alam.

Most people rate them "Poor" saying that on-time removal is necessary whereas some rated them "Average" and "Fair" to be used for getting the latest information.

FINDINGS

The reasons for significant deviations in achieving Environmental Sustainability in the neighborhoods is calculated by using reliability test in which all the variables were highly correlated which shows there are significant reasons which create hurdles in achieving Environmental sustainability Perceptions of the residents regarding their quality of life and the sustainable development of their area is assessed by using structured questionnaires.

CONCLUSION

- Environmental sustainability is a concept based on a notion of ecosystem services both renewable and non-renewable resources and waste absorptive capacity that provide benefits to humans and thus improve their welfare. In order to enjoy and use the services throughout the ages, humanity must learn to live within the limitations of the biophysical environment.

- Many countries around the world have domestic methods that will remain the sole or dominant system within their respective markets, e.g. Green Star in Australia, New Zealand and South Africa, CASBEE in Japan, and Green Mark in Singapore. However, there are many other countries and regions where both BREEAM and LEED will expand their presence over the next decade as a result of both increased demand and active promotion. Market forces and 'branding' will, in the fullness of time, invariably play a role in dictating the extent to which voluntary systems become de facto international approaches and influence how domestic systems will evolve.

- The analysis shows that many parameters included in the environmental sustainability tools are completely neglected while designing these neighborhoods; therefore, these parameters did not achieve any point resulting in low ratings of the neighborhoods. These parameters include the provision of network cycling, car clubs, flexible parking, proper facilities regarding public transport, electric vehicle charging points, business priorities sectors, light pollution etc.

- The survey results regarding the residents' perception towards the community facilities show that the residents of both the areas whether residential or commercial are not satisfied with the community facilities and are correlated at the significance 0.05, such as law enforcement, neighborhood security, garbage collection, roads and streets, parks and recreation, sidewalks and pedestrian safety, storm drainage, street lighting, street and public signboards, outdoor activities and safety.

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