

# ANALYZING SUSTAINABILITY OF RESIDENTIAL NEIGHBORHOODS; (CASE STUDY: JAHEDSHAHR NEIGHBORHOOD OF MASHHAD)

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## ABSTRACT:

Neighbourhood is a familiar sign for all citizens because they feel close to it. Concept of neighbourhood as a place for living has a historical background. According to a historical definition, neighbourhood is defined as different urban units which include different social classes or urban regions with business or official boundaries that cover a range of social groups. In today's urban society, in order to reach sustainable urban development, neighbourhoods are considered the most fundamental urban elements and an intermediate ring between city and citizens. Since a long time ago, cities' neighbourhoods have had a special stance in the formation and organization of urban affairs. By providing its required daily services and creating neighbourhood symbols and specific characteristics, each neighbourhood causes its inhabitants to have sense of attachment and identity so that each citizen is identified by the neighbourhood in which s/he is living. Therefore, sustainability of residential neighbourhoods is an important factor in urban sustainability. Using a descriptive-analytical method and document and field data collection techniques, the current study aimed to investigate sustainability of Jahedshahr residential neighbourhood in Mashhad metropolis, as one of the neighbourhoods with urbanization plan (in which urbanization principles and criteria based on principles of sustainable development are considered).

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## INTRODUCTION

Increase in bio-environmental instabilities and decline in quality of all aspects of human life have made theoreticians and pundits look for solutions of this issue. Result of their effort has been the viewpoints presented in terms of "sustainable development", which has been gradually transformed to a novel model in the world's prevailing scientific viewpoints and policies during recent three decades [1].

Urban neighbourhoods as the smallest organizational-spatial unit of cities play an important role in urban sustainability so that formation of neighbourhood identity, security, spatial and physical development and consolidation of social relations are related to sustainability of urban neighbourhoods [2].

On the other hand, some of the new and man-made neighbourhoods, which have been planned, designed and constructed at the beginning of the contemporary urbanization movement, are facing destruction and declination and some others possess continuity, liveliness and prosperity of life and have remained sustainable. Pieces of evidence indicate that new man-made neighbourhoods face very

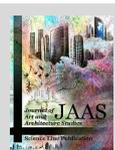
different experiences after a relatively long period of time [3].

The main focus of this study was to investigate Jahedshahr residential neighbourhood with an emphasis on sustainable development indicators in order to identify its existing problems and find solutions for increasing life quality of its inhabitants. Jahedshahr neighbourhood is one of the new and man-made neighbourhoods on western side of Mashhad metropolis. This work aimed to investigate its sustainability based on local sustainability criteria and indicators. Sustainability criteria and indicators included three socio-cultural, economic profitability and welfare and bio-environmental components, each of which contained the following criteria and indicators (Table 1).

In this study, the following questions were answered:

- Is sustainability of residential neighbourhoods a challenge ahead of sustainable urban development in Mashhad metropolis?
- What is the solution for reaching acceptable sustainability in Jahedshahr neighbourhood?

Accordingly, considering what has been mentioned so far, it can be inferred that the new man-made Jahedshahr neighborhood, due to having



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a pre-thought urban development plan, had an acceptable level of urban sustainability.

### MATERIAL AND METHOD

This study was an applied, descriptive-analytical research. Regarding its sampling, 50 questionnaires were completed in Jahedshahr neighbourhood. The interviewees were selected from different groups of inhabitants, pedestrians and local retailers. The questions were classified into 4 groups and details of each section were as follows:

- Part one: General questions including questions about interviewees' personal information such as age, sex, education, duration of residence, reason for selecting the residential neighbourhood, etc.

- Part two: Characteristics of land and activity use system including closed and semi-closed questions aiming to study people's tendencies in selecting type of applied services, lively activities during different times of the day, etc.

- Part 3: Characteristics of movement and access system studying problems associated with transportation of inhabitants to other parts of the city in semi-closed questions.

- Part 4: Characteristics of skeletal system of public spaces containing open, semi-closed and closed questions aiming to study behavioral bases, people's perception and experience, identity, people's perception and experience about identity of public spaces, behavioral bases and sense of attachment.

Table 1: Local sustainability criteria and indicators [4]

Components	Criteria	Indicators	Collection method of data required for producing indicators	
Socio-cultural	Identity and liveliness	Opinions of inhabitants, specific events, existence of public area for interaction of inhabitants	Questionnaire	
	Sense of attachment	Opinions of inhabitants	Questionnaire	
Economic profitability and welfare	Welfare	Access to services	Opinions of inhabitants, level of service uses	
		Access to public transportation	Opinions of inhabitants, number of public transportation terminals close to neighbourhood	
	Profitability	Profitability of business activities	Level of commercial uses	Local information and map
		Value of land	Price of residential and commercial lands	Questionnaire
Bio-environmental	Existence of local green spaces	Level of local green space	Local information and map	
	Proportionate density of population, buildings and activities	Sufficiency of local services	Questionnaire	

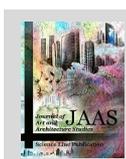
### Research background

Sustainable urban planning is based on the principle that space of a city is formed within its neighbourhood and continues accordingly. Detailed considerations and concepts of sustainable development and its application in design and presentation of policies for residential areas have received less attention than similar cases in transportation planning and industrial organization [5].

Barton believes that urban sustainability does not depend solely on form and shape of a city, but needs major modifications in behaviors and attitudes. Nevertheless, there are high expectations about obvious effects of urban formation on its sustainability. According to the estimates, more than

70% of energy consumption depends on land use planning [6].

In a paper entitled "Reviving residential neighbourhoods", Dr Habibi (2001) investigated old neighbourhoods of Iranian cities as remnants of urban life during past centuries (have been sustainable) and believed that characteristics of these neighbourhoods which made them sustainable included existence of strong neighbourhood identity such as physical, cultural and activity identity, existence of its distinctive urban symbols, existence of spaces for social interaction and active participation and also continuous supervision of inhabitants; he then suggested paying attention to these characteristics as the solution for unsustainability issues of today's urban neighbourhoods. In his paper, factors regarding



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creation and promotion of these characteristics were also studied and some practical approaches were presented in this regard [4].

In another article entitled "Sustainable residential neighbourhood: Case study of Narmak neighbourhood", Dr. Azizi considered identity and liveliness, dynamism and compatibility, variety, accessibility and tolerable capacity and density of a neighbourhood as characteristics of a sustainable residential neighbourhood.

## Theoretical framework

### Definitions and concepts related to neighbourhood

Generally, concept and term of neighbourhood can be defined from various social, psychological, mental, perceptual, architectural (physical) and political dimensions [3]. According to Lynch, neighbourhood is a large area of land which can be identified by common and specific features in such as way that is mentally felt by people when entering the neighbourhood [7].

Neighbourhood is residential and occupational physique with 700-1250 families which has 300-375

m range fluctuation of radius of pedestrian access (4-5 min of walking) and is define by specific cultural elements such as mosques and educational elements such as schools. Each neighbourhood is separated from the surrounding neighbourhoods by a riding network which runs around the neighbourhood [8].

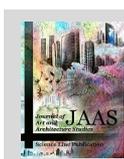
Neighbourhoods have not had a constant and static concept in geographical urban logy and other sciences including urban planning, social and political sciences during the past century. Today, this concept has also experienced radical changes so that there are many discussions about its concepts and dimensions. In fact, it has been specifically defined according to viewpoint of each scientific area [9]. Understanding history of neighbourhood formation as an urban element can also have an important role in better understanding of this concept. Many researchers have presented a completely ecological view regarding neighbourhood [10]. Concept of neighbourhood in various viewpoints of urban sociology, social sciences, urban and social geography and urban planning is presented in the following table (Table 2):

Table 2: Understanding concept of neighbourhood based on its main elements and components in various scientific areas [11]

Scientific areas	Main elements and components	Common features
Urban sociology	Having solidarity and mutual interaction Having specific boundary and limit Neighbourhood as a social unit	
Social sciences	Small scale residential area Relations between inhabitants Inhabitants of a residential area Quality of interactions and relations	
Urban and social geography	Defined and specific boundary within urban context Face to face encounter Collaboration to solve common problems Targeted residence in a specific location	Having specific limit within the city Sense of solidarity and mutual interaction among inhabitants Collective identity and common goals among inhabitants
Urban planning	Identifiable district or boundary within the city Dynamic economic and social identity or entity Integral consideration of physical and social criteria Specific urban limit Having balanced combination of activities Having a specific center Existence of social relations in spatial locality	Integrity of space and activity within the neighbourhood limit

For understanding concept of neighbourhood based on the expected characteristics, major points including having specific limit and boundary- either in traditional or modern urban systems, existence of specific centre and focus, hierarchy of communication networks, balanced combination of activities and also sense of attachment and social dependence in social aspect are taken into consideration. Also, determining area, residential

density and proportionate population have been agreed on in terms of determining proper geographical scale of neighbourhoods. In operational investigation for understanding concept of neighbourhood, criteria of identity (psychological criterion), interaction (behavioural criterion) and connection (structural criterion) have been influential. However, most of materialists, phenomenologist and those seeking consensus have



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tried to understand concept of neighbourhood in conceptual frames of liveability and humanistic, instrumental and axial needs. Most of these approaches have majorly emphasized on economic, social, physical, bio-environmental and ecological criteria and indicators and the sum of their viewpoints can demonstrate theoretical fields for understanding neighbourhood as a limit for fulfilling sustainability development [11].

### Concept of sustainable development

Sustainable development has been discussed for more than three decades and its various dimensions have been extensively considered in the related literature (Table 3). Nonetheless, many dimensions of sustainable development have not been seriously agreed on [3].

Table 3: Sustainability dimensions in sustainable development [12]

Dimensions	Characteristic
Ecological	Healthy environment for humans Sensible use of renewable natural resources Protecting non-renewable natural resources Integrity of ecosystem: tolerable capacity, biological diversity, etc. Reduced volume of waste and pollution, their recycling, etc.
Economic	Official occupation Growth Justice Efficiency Consistency
Social	Education Security Participation Equality of opportunities Empowerment Institutional development
Cultural	Human interaction with nature Ideas and beliefs regarding relation with bio-environment Guarding the values

Origins of sustainable development attitude toward dissatisfaction with outcomes of socio-economic development and growth in cities are related to ecological viewpoint. Since early 1970s, extensive movements with bio-environmental concerns have started against conventional urban development (especially, in metropolises) in northern countries; finally, in early 1990s, the necessity of reviewing trend of global development with sustainable development attitude was accepted [2]. In order for sustainable development to enter mainstream discussion of global policy, the report published by World Commission on Environment and Development (1987), which is generally known as Brundtland Commission, was the most influential event. This report presented the same definition for

sustainable development as the one which has found global acceptance today: "Development which provides current needs without jeopardizing capabilities of next generations in meeting their needs" [13].

The main concept of sustainable development is a city defined by Peter Hall as: "A form of modern development which guarantees continuous development capacity of cities and urban societies for the following generations" [14].

### Axis and purpose of sustainable development

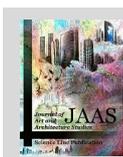
Since 1970s or during the past 4 decades, many theories, models, researches and papers have been presented about urban sustainable development. According to their authors, sustainable development is generally based on the following axes:

- Promoting quality of urban environment including ecological, cultural, political, facilities, social, and economic sections
- Promoting long-term social and bio-environmental health in cities
- Efficiency-intensive land use- i.e. the surrounding urban environments should not become instable or consumed by urban development.
- Proper land uses and observing standards (including proper urban density, proper open space, considering human scale in city, less vehicles and more access)
- Efficient use of resources and less waste and pollution: planning for resources (including restoring natural systems, proper housing and life environment, healthy social ecology- health of human gatherings in city, stable economy, participation of people, maintaining local wisdom and culture) [15].

### Neighbourhood and urban sustainable development

Urban sustainable development means conditions in which today and future citizens can live with peace and security and, besides being healthy, could have a long and constructive life [16].

Compared with various definitions and concepts which have been so far presented for sustainable development at international, national, regional and urban levels, concept of sustainable development at neighbourhood level has not been clearly defined yet and its dimensions have not been seriously studied and analyzed; however, urban neighbourhoods are areas and boundaries in which dimensions of different issues are completely tangible. For instance, change in structure of families and changes of generations, increase or decrease in movement and motion, sensitivity of bio-environmental issues including open spaces, destruction of natural environments and excessive consumption of resources are among the features with tangible effects at neighbourhood scale. Regarding physical dimensions and life quality indices, features including access to services and equipment, access to



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workplace, quality of housing, evolution of transportation systems and their effects on communication networks, form of passages, realization of ideas regarding urban design, different methods of construction and application of urbanization roles can be mentioned. In this regard, urban planning at neighbourhood scale also introduces various processes, topics and theories such as neighbourhood-based planning theory [3].

In order for cities to achieve sustainability, efforts must go beyond physical structures. If cities are supposed to have efficient performance, it is necessary to focus efforts on all the aspects from physical environment and social institutes to less significant cultural aspects which have a considerable effect on people's understanding of separate neighbourhoods and the entire urban societies [17].

Today, considering urban difficulties, urban planners look for urban sustainability and seek to achieve urban sustainable development. Therefore, they have started to fulfil goals of sustainable urban development and improve bio-environmental conditions in cities by first providing plans for removing urban problems and second using citizens' participation to get informed about urban problems.

### Studied area

Jahedshahr neighbourhood with total area of 93 ha was located on west of city of Mashhad in municipality District 12. This neighbourhood was constrained by Majidieh, Misagh and Mashhad international fair (Figure 1).

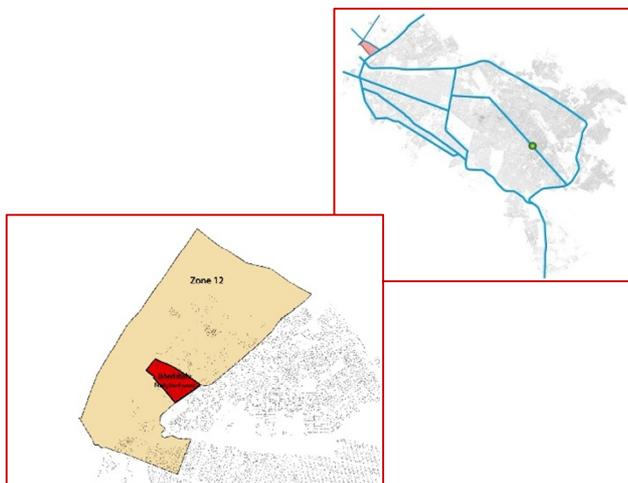


Figure 1: Location of Jahedshahr neighbourhood in municipality District 12 of Mashhad

### RESULTS

This study investigated sustainability rate of Jahedshahr residential neighbourhood based on the criteria selected for socio-cultural, economic profitability and welfare and bio-environmental components so that studying each of these criteria in this residential neighbourhood demonstrated level of sustainability and un-sustainability.

### Socio-cultural component

Neighbourhood identity and liveliness: Issue and principle of liveliness are considered an important criterion in sustainability of residential neighbourhoods. Accordingly, the interviewees were asked whether the neighbourhood was lively or not and, if the answer was positive, they were asked to name the reasons and locations which reflected such liveliness. Approximately 48% of the people believed that Jahedshahr neighbourhood was lively, which was respectively owing to parks and commercial, sport, religious and cultural uses. It is worth mentioning that these locations are considered to be lively factors by people because of having the following features [18]:

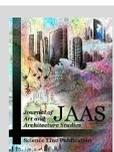
- Having proper physique and shape
- Existence of diversity in functions and performances
- Attractiveness of environment
- Presence of people from all age groups and sexes beside each other
- Having a unique identity and feature
- Having proper locations for stops
- Having sufficient security and safety

Location of social interactions is another important factor in studying neighbourhood identity and liveliness. Besides using streets as a public and accessible place for traffic, people need safe, convenient and easily accessible public places which provide the possibility of social interactions and getting together. More than 50% of the interviewees mentioned mosques as a public and collective place. In addition to mosques, residential buildings, dead-ends, alleys and parks were also named as places for social interactions. One of the problems of these people was lack of mandatory gathering and collective places inside their residential units.

Sense of attachment of inhabitants to their neighbourhood: Sense of place is an important factor in consistency of people and the environment and results in better exploitation from environment, satisfaction of users and finally their sense of attachment to the environment and their continued presence [19]. Sense of attachment is a higher level for sense of place which has a determining role in exploitation and continued presence of people in that place. This feeling leads to formation of a bond between people and their environment, in which people consider themselves a part of that place [20].

Inhabitants of Jahedshahr neighbourhood had the least sense of attachment to the place. They were often migrants with short history of residence who had selected this area for residence due to their particular problems. As a result, no acceptable relationship was observed between the environment, inhabitants and tradesmen of this neighbourhood.

### Economic profitability and welfare



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- Access to services: Access to services is one of the most important and fundamental factors in measuring sustainability of residential neighborhoods. Except in medical services, Jahedshahr neighborhood faced serious shortage in other services, especially sport and cultural ones, which induced a negative factor in sustainability of this neighborhood (Figure 2, 3 and Table 4).65% of Jahedshahr inhabitants stated that they were more willing to do shopping from commercial complexes while there were no such complexes in this area and they usually met their needs through using linear commercial units.

- Access to public transportation: The most important public transportation systems in city of Mashhad were buses, mini-buses, taxis and subway. Routes of the subway system were out of this neighborhood and mini-bus system had limited lines; thus, they did not play a considerable role in transporting inhabitants of this neighborhood to other parts of the city and only buses and taxis are the major systems of public transportation available for inhabitants of Jahedshahr neighborhood.



Figure 2: Scattering of service uses in Jahedshahr neighborhood

Table 4: Relative share and level of services (to residential area) in Jahedshahr neighbourhood

No.	Land use	Area (m <sup>2</sup> )	Relative share from total residential area (percentage)
1	Commercial	3088	0.92
2	Educational	8120	2.42
3	Cultural	-	-
4	Religious	2859	0.85
5	Sport	-	-
6	Medical	55969	16.66
7	Total	70035	20.84

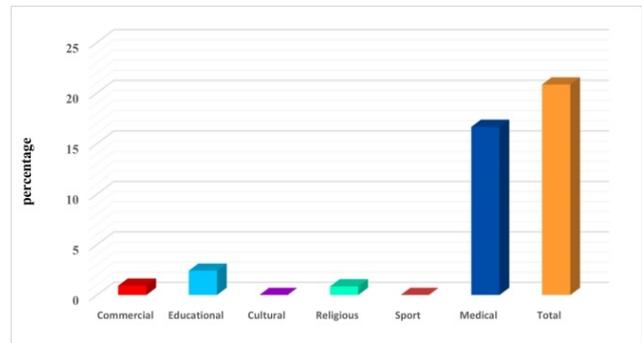


Figure 3: Relative share of service uses in Jahedshahr neighbourhood compared with residential area

- Profitability of business activities since most of commercial units in Jahedshahr neighborhood had been formed for meeting regional needs and, as was mentioned before, inhabitants of this neighborhood had more tendencies to do shopping at commercial complexes; these commercial units were not very profitable.

- Value of land: The following table shows price of land and buildings per square meter for residential and commercial uses in 2008 and 2012 (Table 5). Since this neighborhood lacked integrated commercial land uses, it was not possible to determine price of this kind of use. The mentioned table indicates considerable increase in price of land and buildings in this neighborhood which occurred along with other parts of Mashhad metropolis during this period.

Table 5: Cost average of land per square meter (in thousand Toman) in Jahedshahr neighbourhood [21]

Description		2008	2012
Land use		350	700-900
Building unit	Residential Apartment	533.3	900-1200
	Single-family house	-	1401-1500
	Commercial unit	-	-

**Bio-environmental component**

- Existence of green space in the neighborhood: As shown in the following map, this neighborhood had acceptable condition in terms of green spaces so that around 4.4 ha (5% of the neighborhood) with relative share to residential land use of about 13.21% was dedicated to this use (Figure 4). It must be noted that most of the inhabitants expressed their satisfaction with regard to accessibility to green spaces of the neighborhood.



Figure 4: Scattering of green spaces in Jahedshahr neighbourhood

- Proportionate population, building and activity density: The index for measuring proportionate population, building and activity density is sufficiency of local services for citizens and in comparison with the residential area. This issue is in close relationship with service level of the neighborhood and was discussed in "Access to services in the neighborhood". According to Table 4, lack of proper services for daily needs of inhabitants was the most important result of this study.

- Summary and conclusion: With changes in conditions and factors of urban development and expansion during recent years, residential neighborhoods have found a special stance in formation of cities. Urban neighborhoods are places and regions, in which dimensions of issues are completely tangible. Therefore, effects of changes in family structure and generation, increase or decrease in movement and motion, sensitivity of bio-environmental issues including open spaces, destruction of natural environments and excessive consumption of resources on sustainability of residential neighborhoods can be observed.

The present study investigated sustainability criteria in residential neighbourhood under socio-cultural (including identity and liveliness and inhabitants' sense of attachment to neighbourhood), economic profitability and welfare (including access to services, access to public transportation, profitability of business activities and land value) and bio-environmental (including availability of green spaces in the neighbourhood, proportionate population and building and activity density) components. The research hypothesis was as follows: since Jahedshahr neighbourhood is a man-made neighbourhood with urbanization plan, it can be considered a sustainable neighbourhood for living; however, results of this study did not confirm this hypothesis and identified it as an un-sustainable residential neighbourhood. The following are among of the obtained results:

- History of residence in Jahedshahr neighborhood was short and most of the inhabitants

were migrants who, due to specific reasons, were forced to choose this neighborhood for living.

- Generally, share of service uses to residential uses was very low and inhabitants usually had to travel to other parts of the city to supply their needs; in this regard, they unfortunately faced problems such as lack of proper service of public transportation system.

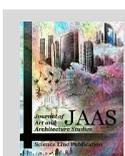
- Like other areas of Mashhad metropolis, land value of this neighborhood had experienced a significant increase during last few years; however, due to lack of tendency for constructing integrated commercial units in this neighborhood, commercial uses were not highly profitable in this neighborhood.

- Considering share of other service uses, it can be inferred that this neighborhood had a better condition regarding green spaces and its 13.21% share to residential use was acceptable.

At present, the biggest threat for sustainability of Jahedshahr neighbourhood might be increasing construction of residential units, lack of attention to providing the required services and lack of proportionate densities. Eventually, it can be concluded that, when designing and planning new urban residential neighbourhoods, all three topics of sustainability (socio-cultural, economic and bio-environmental) must be simultaneously taken into consideration because survival and sustainability of any performance and development depend on these factors.

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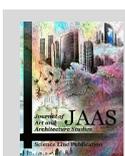


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