

Sustainable Residential Buildings in the Tehran Metropolitan Area

Ahmad. Bairami^{1*}, Manochehr Tabibian²

¹MSc Department of urban Planning, Islamic Azad University, Qazvin, Iran

²Prof of Faculty of Architecture & Urban planning, Islamic Azad University, Qazvin, Iran

*Corresponding author's Email: Bairami.ahmad@gmail.com

ABSTRACT: Housing is one of the first things that humans have always had to grapple with and always trying to find appropriate and reasonable answers for its issue. Beginning with Twenty-first century, Third World faces several important challenges such as providing proper shelter, employment and environmental sustainability. In between these, proper shelter is important because the basic needs of the household or individual such as sleep, rest, protection against weather conditions and etc. Appropriate housing is an important goal of the development programs. One of the Indicators for assessing the utility of housing is materials and structures used in residential buildings. This research tries to examine strength of the residential buildings in the cities of Tehran metropolitan area in the past three censuses in 1986, 1996 and 2006. Metropolitan area of Tehran has 20 urban centers in 1986, in 1996 this area had 27 urban centers and in 2006 this area had 53 urban centers. Result show Tehran city has the highest percentage of sustainable residential buildings in the urban centers of Tehran metropolitan area for each census. The mean for percent of sustainable residential buildings in Tehran metropolitan area has been upward all time; this amount achieved 66.80 percent in 2006 from 3.70 percent in 1986. It means substantial growth. Standard deviation is used for measurement of distribution for sustainable residential buildings in urban centers of metropolitan area. Result shows, standard deviation for residential units has been upward from 1986 to 1996 and have been decline from 1996 to 2006. This means increasing development gap in the field of sustainable construction in the urban centers of Tehran metropolitan area during the years 1986 to 2006 and the peak is year 1996.

Key words: Metropolitan Area, Sustainability, Residential Buildings, Building Strength, Assess the Degree of Development.

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INTRODUCTION

House, as a realistic issue, is a primary matters that human was thinking about it and always he is trying to find the suitable and rational answer for this necessary (Habibi et al., 1988).

Establishing of proper house is a one of the goals in development planning for all time. Prospering for house can be defined in many aspects. Type of material and kind of construction in house is a one of the prevalent indicates for measurement of property in house. This research study measure of Strength for housing buildings in urban centers of Tehran metropolitan area.

This research, at the first, introduce Housing and its position in regional planning and in the following, study measure of Strength for housing buildings in urban centers of Tehran metropolitan area for During the last three censuses in 1986, 1996 and 2006. Research is a kind of applied research that improve and perfecting behaviours, methodology, tools, materials, products, structures and patterns of human societies by use of The results of fundamental research. As stated usage research uses Results of fundamental research. Defined in the fundamental research that this type of research Deals To explore the nature of the phenomena and relationships between variables, objects, principles, laws and theories,

and theories concerned with the construction and testing and it would help to expand the frontiers of knowledge.

Method of this research is descriptive – analytical. Indicators have compiled from General Census of Population and Housing Census data in Years 1986, 1996 and 2006. In analyzing the data use variance for Measure Distribution Data and Average for Analysis of the data Process.

Housing

Housing is one of the main needs of human and its effect is very vast in individual and social life. Housing, as a Shelter for family, and, as a part of economy that effect in industry and Services, has its Influence in Occupation. In other words, this part is motive engine for economy. Housing in third world, that insurance do not meet the needs of aging properly, can act as a means of saving for future needs. In addition, in Inflationary conditions, housing, as a durable commodity, and in order to keep wealth and avoid devaluation, playing role as good investment for the family (Abbaslo, 2005).

Beginning of the twenty-first century, third world countries face many important challenge such as property shelter, occupation and sustainable environmental. In between, property shelter has important position because the main needs like sleeping,

rest, protection in front of bad weather is responded in there (Ahari, 1988).

Type, quality, size, and features of housing can affect on all aspects of human. And certainly, Can be claimed with improved housing characteristics not only in physical but also in Non-physical and social issues - culture will rise. To provide a universal definition of housing, affordable housing is defined as: “Adequate shelter is only meant to have a roof over everyone's head. Adequate shelter means the comfort, property space, physical access and good security, property security, stability and durability of construction, lighting, ventilation and heating systems right, good basic infrastructure such as water supply, health and education, waste disposal, environmental quality factors, proper sanitation, adequate and accessible location with regard to work and basic facilities. That all such matters should be given the ability to provide (UNDP, 2012/1/20).

Housing – one of the main needs for human- have regional characteristic. Thus, its necessary that planning and policy for this part is adapted by noting to the correct information about different regional features (Zebardast, 2003).

Despite Employing planning in many countries, Housing is one of the most stable of urban issues always in some developed and developing countries. Reason is that the housing problem is not desperate of civilization problems. And housing issue and urban matters have effect in each other very strongly (Daneshpor, 2002).

Housing planning

Different society attempts for achievement to the pervasive approach about housing planning were never notable. Methods and techniques are not yet fully developed and remain more theoretically. Anyway, a housing planning process, like a system, included some elements. By this conception that each element is individual system, these elements according to Scheme 1 are:

- Natural system, means the system that housing system is on it
- Valuable system, means all values that the society have them about house
- Society for housing planning, means Housing Applicants
- Building houses, which was included by three elements: land, material, the element will be used in building of houses (like workers, technology)
- Guidance and control system, included Decisive factors in public and private area, Planning documents and legal instruments
- Connection system, included urban and regional connection system and connection between housing system and another urban system (Daneshpor, 2002).

Analyzing and planning for house, included quantities and qualities matters, be applied by tools that defined Housing indicates. This indicates is agent of economical, social, cultural and physical aspects of housing. Planning for housing should be applied by different aspects:

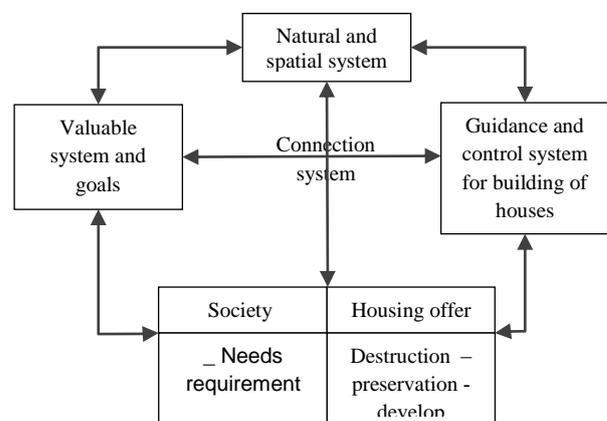
Economical indicate like: The ratio of housing costs to total household expenditure, the total cost of land in urban areas

Social indicates like: Population and number of households, family rate, Households in housing units, People in housing units, People in the room, Bedroom residential unit

Physical indicate like: The number of housing units by type of material, land area, Residential land per capita (Azizi, 2004).

Housing Plane in regional scale, like of Nature house, has many aspects. This physical, economical and environmental and aspects will be intertwined in housing plan in regional scale. This characteristic according scheme 2 should be studied in regional scale. But we can say this it is true that this characteristic should be studied but it maybe couldn't be useful for a special plan or the region might not be homogeneous that we can ignore its internal differences. In the case that regions is not homogeneous can be considered to the more general part. In such as this regions, environmental and quality life and social aspects should be studied in the much smaller parts of sub regional and even some social and physical features can be searched in the receive identity of neighbourhood in cities (Shlay, 1995).

Process of housing spatial planning , as a part of process of a overall spatial planning, is a Twofold process that are included Both elements of decision-making and decision- taking. Any attempts for codify Housing policy is a part of overall planning that have technical role for decision-taking for local management in decision-making process and supply necessary information (This information included analyzing of problems; identify goals and strategy and etc).



Scheme 1. Elements of housing Planning process (Source: Daneshpor, 2002)



Figure 2. Research aspects for housing in regional scale
(Source: Shlay, 1995)

MATERIAL AND METHODS

The Type and Method of the Research:

The present study is an applied research. An applied research is a type of study, which is conducted to improve and amend the behaviors, methods, tools, productions, structures and patterns used by humane societies, using the results of basic researches. As mentioned before, applied research utilizes the results of basic research. In defining basic research, it is said that, basic research is a type of research, which addresses discovering the nature of objects, phenomena, and the relation between variables, principles, rules and making or testing the theorems and theories and it helps developing the knowledge borders. The current research method is based on descriptive-analytic methodology. The required indices are collected from the Census of Population and Housing data, from Statistical Center of Iran, in 1986, 1996 and 2006. In analyzing the mentioned data, standard deviation is used to measure the dispersion of the data, and finally to measure the balanced development; their average is used to analyze the trend of data.

Indicators

This research studied the type of construction usage in housing buildings in the Tehran metropolitan area. Information about this matter derivation from the schedule of conventional residential building in terms of materials. This schedule is collected by the Statistical Centre of Iran in Census of Population and Housing. material in this schedule Classified on three general categories : metal structure, concrete structure, and other; Where are the other categories are : Brick and iron or iron and stone, brick and wood or stone and wood, cement blocks, all brick, all wood, clay and wood, mud. Framed buildings (metal or concrete) are sustainable buildings.

The ratio of sustainable residential buildings to the total amount of residential buildings in the

metropolitan area of determines the amount of sustainable construction in Tehran metropolitan area.

Study area

In this research, the urban centers of Tehran metropolitan area have been examined in the three census years 1986, 1996 and 2006.

Metropolis can be defined from different perspectives with different parameters. But In general it can be stated that Metropolis is a collection of several cities have been in ranks of urban hierarchy. And it is clear that this area includes many villages. Based on the definition come from "municipal planning and management for Tehran Urban Collection and other major cities and towns around them" plan, Tehran urban collection included the cities in the Tehran, Damavand, Rei, Shemiranat, Karaj, Varamin, Islamshahr, Savojbolagh and Shahriar counties. At the time of review and approval of this plan, Tehran urban collection area would equal to political and administrative borders with the provinces of Tehran (excluding Firoozkooh County). In this research, according this fact that Firoozkooh County only has two urban centers, Tehran metropolitan area has been considered equal to political borders with the provinces of Tehran and Alborz. This research studies cities in the Tehran metropolitan area. Different criteria would expression for the definition of the cities. The criterion for being a city – for each settlement – of this research is based on information from the Interior Ministry in each census. Base on The information come from the political division office of Interior Ministry, Statistical Center of Iran classified each settlement in terms of urban and rural. Figure 3 shows the Tehran metropolitan area.

The number of urban centers placed in Tehran and Alborz provinces and the number of urban centers placed on Tehran metropolitan area for three censuses in 1986, 1996 and 2006 shows in Table 1.

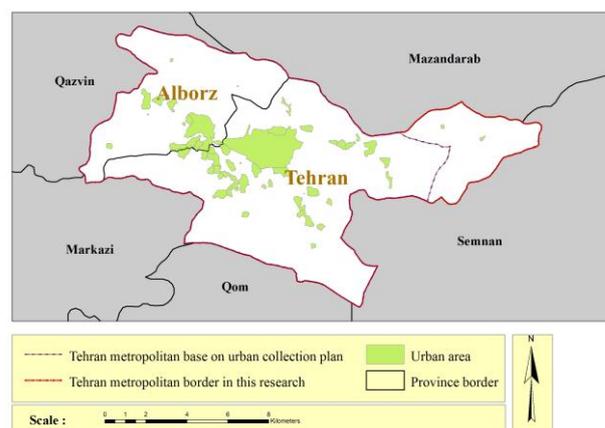


Figure 3. Tehran metropolitan area (Source: Bairami, 2013)

Table 1. Number of urban centers in Tehran metropolitan area for census years in 1986, 75 and 85

Census year	The number of urban centers			Description
	Alborz provinces	Tehran provinces	Tehran metropolitan area	
1986	4	14	20	Qom city has been considered within the borders of Tehran In the census of 1986
1996	6	21	27	
2006	13	40	53	

RESULT AND DISCUSSION

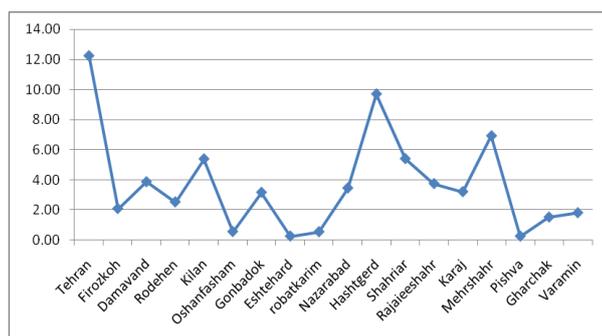
Evaluating the sustainability of residential buildings in the Tehran metropolitan area

22 urban centers placed in Tehran province area in 1986 year. In that time, Tehran province included current Qom and Alborz political border. With respect to cases arising in relation to the metropolitan area of Tehran, Tehran metropolis in 1986 had 21 cities. Information about Islamshahr city, as a city from year 1986, is not available. In addition, information about Tajrish and Rei urban centers do not provided from Statistical Centre of Iran. According to these matters, the number of urban centers in Tehran metropolitan area was 18 in the year 1986 that have been investigated.

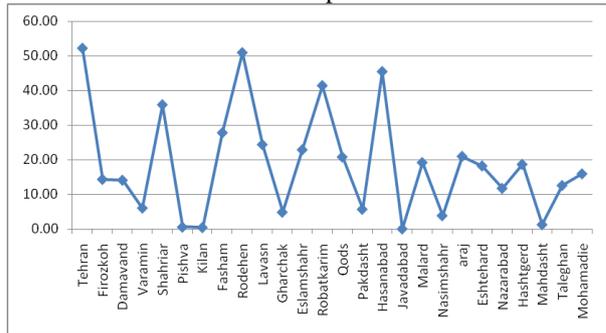
Tehran province area had 29 urban centers in 1996 year. Tehran province included current Alborz political border in the 1996 year. Tehran metropolitan border equaled to Tehran province political border in that time. Like the year 1986 Census, information about Tajrish and Rei urban centers do not provided from Statistical Centre of Iran. According to these matters, the number of urban centers in Tehran metropolitan area was 26 in the year 1996 that have been investigated.

Tehran province area had 53 urban centers in 2006 year. Tehran province included current Alborz political border in the 2006 year. Tehran metropolitan border equaled to Tehran province political border in that time. Like the years 1986 and 1996 Census, information about Tajrish and Rei urban centers do not provided from Statistical Centre of Iran. The other point is, the Arjmand city from the east of Terhran province promote to the urban centers in year 2005 and had 1700 population in year 2006 census. Amaiesh of Tehran province plan mentioend to the minority of population of Arjmand city and Notes a large difference population crowded between Arjmand city and other cities in the province. Also, according to field visit from the Arjmand city, it seems that Arjmand city has been not paralleled by other cities in the Tehran metropolitan area. It should be noted that that promotion of Arjmand city to a urban center couldn't have a political or security reasons. Because this city is not place in the national subdivision centers, such as center of county or Ward or district, or Strategic locations, positions such as provincial or international borders. According to these matters, the number of urban centers in Tehran metropolitan area was 50 in the year 2006 that have been investigated.

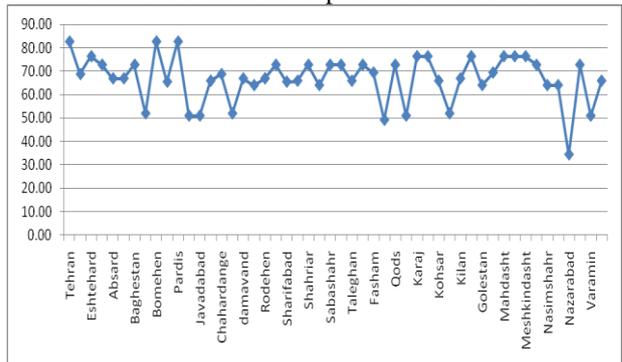
Graphs 1, 2 and 3 show the percent of sustainable residential buildings (with metal or concrete structure) to the total amount of residential buildings during the last three censuses in 1986, 1996 and 2006.



Graph 1. Percent of sustainable residential buildings in cities of Tehran metropolitan area in 1986



Graph 2. Percent of sustainable residential buildings in cities of Tehran metropolitan area in 1996



Graph 3. Percent of sustainable residential buildings in cities of Tehran metropolitan area in 2006

Table 2. Mean and standard deviation for percent of sustainable residential buildings in cities of Tehran metropolitan area in 1986, 1996 and 2006

Census year	Mean	Standard deviation
1986	3.7098	3.2721
1996	18.8218	15.5164
2006	66.8072	9.7608

Table 2 shows the mean and standard deviation for percent of sustainable residential building in the three censuses 1986 to 2006.

According to the statistics obtained, Tehran city, with 12.26 percent in 1986, 52.16 percent in 1996 and 82.55 percent in 2006, have the highest percentage of sustainable residential buildings in the urban centers of Tehran metropolitan area during three censuses.

As can be seen from Table 2, mean for percent of sustainable residential buildings in urban centers of Tehran metropolitan area has been upward all time. The amount achieved 66.80 percent in 2006 from 3.70 percent in 1986. It means substantial growth.

The standard deviation is used to measure the distribution of sustainable residential buildings in the urban centers of Tehran metropolitan area. Standard deviation is a tool by which we can measure the growth rates of the balance; Whatever the number of standard deviation is smaller, it Show that the numbers are examined are more closed, or rather have a more balanced development. As can be seen from Table 2, Standard deviation for percent of sustainable residential buildings in urban centers of Tehran metropolitan area has been upward from 1986 to 1996 has and declining

from 1996 to 2006. This means increasing development gap in the field of sustainable construction in the urban centers of Tehran metropolitan area during the years 1986 to 2006 and the peak is year 1996.

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