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Examination of environmental effect of green roofs through a sustainable development approach

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Abstract_ _Expansion of cities leads to destruction of natural environments and farm lands. Therefore, establishment and development of green spaces has a critical role in live of all creatures including human being. Considering the data is published by IEA, 40 percent of world energy is for consuming energy in buildings . Attention to different aspects of foundation of these buildings and houses with low energy consumption and maximum conformity with the natural environment and producers become doubled. Green houses and roofs hold several advantages of reduction of air pollution, sound pollution, energy storage, recreational spaces, decrease of cost of maintenance and exchange of roofs all together. In the current paper, through using library sources besides collecting required information descriptively –analytically, different aspects of green roof and analysis of methods of its development in cities on the basis of standards of sustainable development are considered.

Keywords**:** green roof, environment, sustainable development, green building, live surface

1. Introduction

Creation of green roofs on buildings is becoming an affordable use in many European neighboring countries, especially Germany and also in the U.S. (Osmundson,1999)in Netherlands large attention is given to number of small projects (Teeuw etal., 1997).However, further efforts are required to implement large projects reflected in the report of the municipality of Rotterdam. (Anonymus, 2007)The onsequences of green roofs can be implemented even on the walls. Green systems have been developed in recent years as the first impression can be taken advantage of on campus or wall (Hendriks,2008).

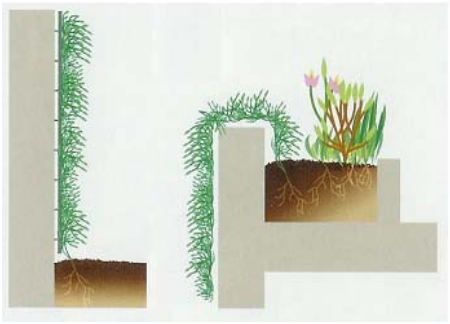

Figure 1 Different types of façade greening from Hermy et al., 2005

Some research studies have been conducted in different countries to assess the energy, have separately examined the green systems function (Sam C. M. Hui, Miss S, 2011).Green Building in North American urban planning in cities like Chicago, Portland, Oregon and Toronto, Canada is considered to be effective (Abbasi, D., Heydari, Ali. 2013).Green roof is one of new approaches to sustainable architectural concepts that it can be raised to increase the per capita green space, green environmental quality and sustainable development of urban uses (Sebghati,eiraj, 1992).Reduction of urban air temperatures and fighting against the heat island effect that occur in cities, especially large cities and densely populated area are of the effects of green roof (Golden Lotus dedign.com) Le Corbusier and Wright were pioneers of naturalism and the green roof creation of the twentieth century and the most successful examples have ever been built (www.greenroof.ir) Studies show that roofs having flower cover do not absorb heat more than 77 ° F, therefore are effective in reducing air pollution and rate and of energy (Dabbaqian, hooshmant,2009)

2. green roof and Environmental aspects(green roof)

Green roofs is a viable technology that can penetrate spirit of life into buildings and urban life, so that they are called “living roof "living roof "(eco-roof) and "rooftop garden" or garden roof. Simply speaking, using the live cover of green plants and green plants on rooftops and living structures combine to

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enliven and refresh dry, soulless urban living to inspire building structure and residents.
_Plants usually have the ability to reduce heat absorption of buildings, thus the amount of energy needed for heating and cooling is reduced.
The very first factor of higher temperature of buildings is due to exposure to the municipal building aspects in the sun that absorb the solar radiation from urban roads and buildings and store the resulting energy first in building materials , then re-radiation them around.Levels of crop plants cannot increase more than 5.4 ° C due to transpiration , therefore temperature it is cooler than most.This means that they make the region cooler up to 3/11-6/3 ° C based on the region so that; the cooling is greater in the tropics.This test was conducted by the University "Cardiff". If rooftop gardens are extensively applied , then this new phenomenon will be able to reduce the effects of heat stress and smoke at the island towns.

3. The importance of rooftop gardens (green roofs) in urban design

Emergence of urban landscape design such as spaces has several advantages over the environmental and aesthetic benefits, which many of them in urban areas is a priority.According to calculations, if 50% of Tokyo total area devoted to green roofs , then the city temperature reduces up to 84/0-11/0 ° C that is equal to 100 million yen or 2 / 1 million dollars cost saving a day just by reducing the consumption of electricity.Singapore has done a lot of activities in the development of urban spaces. rooftop gardens have led to increased attention of people and government to designing green spaces and landscapes before the development of tall buildings . in a way that in a poll 80% of Singapore residents voted to increase of the rooftop gardens and their creation in urban areas.Numerous reasons such as leisure and relaxation, beautification of the environment and its close relationship with the natural environment and green spaces were of the major reasons influencing the vote of the Singaporeans (Wikipedia – 2012).
First, the direct effect of solar energy on the roof can control the roof temperature and through thermal control, the energy consumption can be reduced (Castleton, et al.,2010). Fig.2 presents the principal concepts of thermal properties of green roofs (Hui, 2009). Green roof heat transfer is accomplished through the following four mechanisms (Del Barrio, 1998; Niachou, et al., 2001; Feng, Meng and Zhang, 2010).

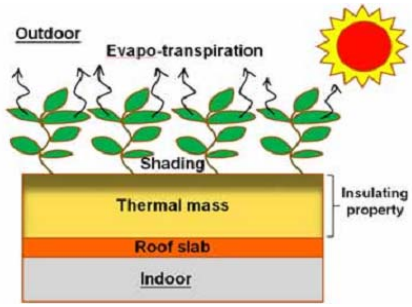

Figure 2. Thermal properties of green roof (Hui, 2009)

Transpiration
 plants shade
 thermal insulation
 thermal mass storage

4. Annual performance of green roofs:

Assuming a green roof system is installed on 80 percent of the roof space, the energy efficiency index, annual energy and cost savings throughout the year will be like the following table (Sam.Hui,Miss.Chan, 2011).

Table 1 - Calculation of Green Roof

Green roof area	6300 m^2 (about 80% total roof area)
Energy saving per green roof area	37.32MJ/m^2 (based on simulation result)
Energy saving due to green roof installation	235,116 MJ
Electricity consumption reduction	65,310 kWh
Annual cost saving	**HK$63,351**

5. Raised purposes and principles in relation to sustainability concepts

5.1 - Environmental Sustainability

_resource consumption must be in the lowest rate.
− A full recycling of waste lubricating− use of renewable or recycled building materials should be from renewable sources (without damage to the environment and reduction of resources).
− protection and pollution-free energy supply and complete recycling (solar heat, wind power, natural biomasses).

5.2 Sustainable Building

_proper efficiency quality, and efficiency of energy (including green house)
_ prevention from pollution (improved indoor air quality and reduced pollution)
_ harmony with the environment (Environmental assessment and recognition).

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5. 3 Environmental Architecture

- Healthy indoor environments: all possible measures need to make sure that the building systems and materials filter indoor air pollution and gases and this air can be kept clean and fresh via plants and filters.
_Energy efficiency: all possible measure need to make sure that the building energy consumption is minimum and heating and cooling, and lighting systems use methods and products to reduce consumption.
_Ecological materials: All possible measures must provide and produce construction materials that have the least environmental damage.
_Environment form: all possible measures should form a plan for the site and its climate to provide a site for ecological optimization based on recycling and energy efficiency, and make harmonious relationships between residents and the nature.
_Good Design: All possible measures should be considered in addition to performance, longevity and beauty of the building in relation to the use, circulation, form, structure, mechanical systems and construction technology.

6. Sustainable Development

Sustainable development is a development that considers humans needs on the basis of the ability of future generations in realizing its needs (World Commission on Environment and Development Statement future Oxford University Press, New York, 1987).Sustainable development is important in three areas of environmental, economic and social and "environmental sustainability" is important in relation to architecture. This fact is in the statement of principles ((Ryu)), which was signed by 150 countries, participated in the conference on Environment and Development in 1992 in the United Nations. Life cycle of global economic activities is coordinated. The first Environmental meeting in Europe was held in 1975 that two provisions were given to urban architecture. In urban areas, maintaining quality of the environment took priority and through development and expansion of human health protection resources are rationally. In 1990, in a letter to the Commission of European Societies ((Statement Green)) , the first European manifest to achieve real progress in the field of urban environment quality within the society was proposed.

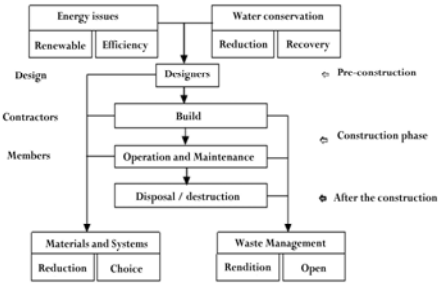

Figure 3 - The real breakthrough in the field of urban environmental quality within the community,(Tabassi, 2012)

7. Sustainable architecture, or green architecture

possibly, some strategies such as green roofs, and solar panels also be regarded as a competitor for each other (Peck and van der Linde, 2010). But through integration with together in the roof, they can increase effectiveness and cooling operation (Köhler, et al., 2002).Sustainable architecture or green architecture is to create health and supporting an environment where residents are living there and that they will be satisfied. Natural world is the spiritual realm and is superior to everything.According to Bolouzof, first man and then society that we have both agreed that we are living in a world of facts. Respect for the environment should be considered as respect for life and architects with logic design direct people's attention that the climatic and environmental projects are not less beautiful than current decorations.Through architecture, the society can be informed about great economic and environmental value as well as harmless and peaceful energies. All four philosophical and ritual elements have excellent ecological implementations in civility and ancient architecture. On the other hand, type of materials and construction techniques common in the past especially those used in the sustainability of the building were used and the main load bearing elements of horizontal and vertical elements due to its large size and weight naturally with lightweight materials and low current volume heat capacity and balancing the energy and storage capacity have been created. Currently, for saving energy , some people are interested in the long term, reducing water effects and improved thermal system in the building (Hui, 2010; Hui,2010, Castleton, et al,2006).

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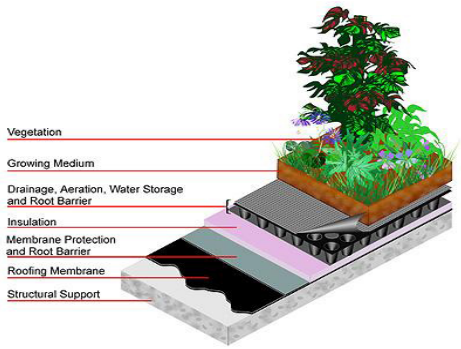

Figure 4 - Part of a green roof

8. Examples of sustainable architecture and green architecture projects including:

-The use of natural energy in everyday use
- The use of waste water for irrigation of green spaces
- ways to optimize the use of energy
-The use of non-recyclable and non- chemicals materials
- Designing and building with use of materials close to nature.
- preventing from negative effects of the building and its products on the environment
-The use of natural herbs
- To avoid damaging the state land
-To achieve the highest quality of living in the environment
-How to use Land
- attention to the ecological character of the area
-attention to the climatic characteristics of the region
attention to effect of light and air and the layout of spaces
- attention to mobility and living on open spaces

Principles of Green Architecture:
– principle I : conservation of energy
– principle II: Working with climate
– principle III : reduced use of new resources
– principle IV: respect for users
– principle V: Respect the site and location
– Article VI: holism

9. Application of Green Architect in Urban Living:

Green architecture is known as the "sustainable architecture" and the designing techniques that consider environmental attitudes in line with the idea of respect for nature. Green architecture is not a new trend .Since in the traditional architecture of ancient civilizations such as Iranian traditional architecture it is in a fundamental way. The typical and systematic form of it can be seen in science "feng shui" or the "Chinese arrangement art". Today, in the aftermath of the negative consequences of industrialized countries, such as environmental pollution, depletion of natural resources and energy crisis and protection of the world's natural resources green architecture has become as one of the most important concerns. Indeed, green architecture functions in order to minimize the negative effects of buildings on the nature and increases efficiency and optimization of using materials.

Figure 5 - Example of a green roof on Chicago City Hall (Razavi,2010,9)

10. Benefits and Disadvantages of green roofs

A. providing adaptive spaces
B. possibility of growing vegetables and flowers
C. decrease of heating and cooling load in the building
Considering the studies, it is found that green roofs can considerably minimize waste of heat and energy consumption in winter.
 reducing the effects of urban warming and climate changes
 increase of living area
 reducing flood
 air filtration and reduction of CO2
 lowering incoming and outside sounds
 enhancing habitat for animals in residential areas
 improving the building surroundings with a garden
 Increased property value due to lack of exhaustion
 enhancing the life of the roof membrane with protection against harmful UV rays

Some of the negative impacts of green roofs are as follows**:**
- The need to strengthen the construct for implementation of green roof
- Matching the design of the roofs with climate conditions is difficult .

Green roofs require acceptable structural measures. Green roofs can provide a variety of "centralized and compact", "semi-centralized" and "wide or expensive," depending on the medium depth of planting and amount of installations be classified.Traditional green roofs are known as centralized green roofs; require irrigation, and other cares. In contrast, large or extensive green roofs are considered as self-retaining systems and need minimum maintenance equipment.In

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contrast, an extensive green roof, which has a surface plantation level and is a part of green building structure. An extensive green roof is not generally available and functional. Other classification is about flat and steep roofs. That needs

11. Green roofs have lots of effect on the society economy including:

-insulation layer are installed on the roof prevent from the damage caused by ultraviolet radiation and chemical damages and act as an insulation against heat waves. this feature of a green roof maximizes the life span in buildings more than other two times and causes cost and energy savings.
-Green roofs insulation significantly reduces the need for energy for heating and cooling of buildings and markedly reduces noise pollution as well as preventing from entering noises into the environment .
- Green roof increases aesthetic appeal and natural beauty of the building in accordance with users' preferences for the commercial, institutional and residential purposes.
- Development of vertical green space is one of the most important achievements of urbanism to reduce pollution and temperatures in large cities. European houses with roofs potting save annual energy rate estimated at $ 100 million.
- In many European countries citizens have experimentally found that plantation on roofs of their homes, reduces heat, and the temperature especially in the summer. During this season, temperature of most of European homes goes up to 140˚ F, but use of vertical green roofs circulate aerosols.
-Studies indicate that potting houses roofs do not absorb heat more than 77˚ F, therefore they are effective in reducing air pollution and energy consumption. Experts believe that if all roofs are planted, it will reduce the temperature of the entire city. They also say that potting of one floor will reduce the cost of cooling up to 20 to 30 percent.

11. Conclusion:

sustainable development has profound implications in three dimensions. Environmental sustainability, economic sustainability and social sustainability only if we can use the benefits of green roofs and stay hopeful to its stability and durability that in form of macro programs in the field of sustainable development and green system are implemented.
In the previous century because of their practical benefits and today's due to their environmental advantages are greened. By merging these two ideas and adding numerous social benefits resulting from the application of these spaces, the local governments can take steps to develop sustainable green roofing and sustainable management(Parks and green spaces in Tehran, Iran, in 2008).

Table2 - Characteristics of the ecological benefits of green roofs and buildings based on sustainable development (Author)

Benefits and sustainable development based on ecological characteristics Roofing and Green Building		
1	Because of the moisture from the cooling air of Prague micro conditions are more suitable.	Micro improve climatic
2	An extensive green roof and insulation to reduce sound reflections Sdara to 3 dB to 8 dB will increase the ceilings	Noise Reduction
3	And reduce air pollution by absorbing carbon dioxide, plants also absorb dust and toxic particles in the air.	Reducing Air Pollution
4	The cooling air are.	Reduce the heat island effect
5	Birds lost their perspectives to compensate by building	Creating the environment for birds
6	Conversion of roof, wall and passive green space	Providing friendly and pleasant environment for building users
7	Production of plants and flowers and beautiful environment	Fruit, vegetable and flower growing possibility
8	According to a survey conducted in 2005 at the University of Toronto's green roof heat loss and energy consumption can be significantly reduced in the winter.	Adding insulation reduces heating and cooling load for
9	The effect of urban air pollution and aerosols, and...	Warming and climate change mitigation
10	Green roofs can be a fun atmosphere, the rest being used	Increase in life span
11	Purifying air pollution	Air and gas filters Reducing co2
12	Sounds up to 18 dB and it comes out of the building is 3 dB or more	Low and moderate intensity sounds
13	Local Pets for healthy life	Increase habitat for pets in residential areas
15	Providing a beautiful green principles	Improve the landscape around the building
15	)Two or three times) to protect against UV rays and weather damage	Maximizing the life of the roof membrane.

Given the ecological and environmental benefits of green roofs in the cities pollution, more attention has to be given to the development and improvement of modern technology especially in large metropolitan areas, which can reduce many of the problems of environmental pollution and in the long run it saves costs and loss of much of the existing material and spiritual capital.

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The review on regulations of urban furniture standards in Sardasht,Iran

(Case Study: Seyed Qotb and Vahdat streets)

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Abstract— As one of the foremost elements in urban environment, the urban furniture may play essential role in utility and aesthetics of space from citizens' view and on the other hand in standardization of urban furniture leads to rising of efficiency in these elements, more sustainability of urban furniture, and improvement of level of users' satisfaction. The present research is aimed at study and evaluation of urban furniture in Sardasht city and furthermore this investigation is of applied type in terms of objective and it is descriptive- analytical in terms of methodology. The evaluation forms have been designed for any furniture through field studies in this survey and also it has explored on current position of street furniture within the studied area by benefitting from technique of interview with the relevant organizations (including municipality beautification organization of a typical city etc) and data and information and then the existing information has been adapted to the prevalent standards and the adjustment model has been presented in the cases where lack of congruity was seen. The study results signify that some weak point are observed in design, topology, and planning for these elements throughout the given zone which include shortage of press kiosks within studied zone, inappropriate height of mail box slot from the ground level, the high distance between street lights in some points of the zone, and lack of drinking water tap in Vahdat Street etc.

Keywords— UrbanFurniture, Design Regulations, Beautification, Furniture Standards, Sardasht (City)

I. INTRODUCTION

A. Subject interpretation

Today, space organization and harmonization is one of the key topics in the field of urban planning [21]. Urban spaces are some locations where the people spend the maximum time of their own and it establishes the relationship with its surrounding environment utmost. Thus, space arrangement and creation of the needed facilities and installations is crucially important. City streets are one of the paramount public spaces in the cities, which serve as the origin for urban furniture. Nowadays in urban life one may rarely find a person, who does not concern typically with urban furniture so we deal with shelter of bus station, ticket booth, park bench or traffic signs and we concern with one or more groups of them [15]. At present, many responsible organizations and centers of the country may not assume proper planning and topology for urban furniture as a definite strategy to create a sustainable, appropriate, and corresponding environment to local conditions and they exacerbate the visual anarchy and inefficiency of these elements in urban environments with lack of planning or deficient and non standard planning in this regard. On the other hand, due to cultural problems (destructive tendency) and not addressing them permanently and unsuitable management, the existing furniture has exposed the users with numerous problems [9]. Street furniture of typical city has been followed by several problems including lack establishment and appropriate topology and devoid of comfort and ease for citizens and at the same time dissatisfaction of citizens from the furniture and what seen there at first glance may strike in mind the discordant and unfavorable urban appearance aesthetically and street messiness in some parts of the studied zones. What intended to express in this research is the evaluation of street furniture (press kiosks, mail box, street lights, and drinking water taps) within the studied zone and its compliance with the current standards for furniture and presentation of an adjustment model with benefitting from the current standards. Now with respect to what it mentioned, this question may be raised that what is the condition of harmony among street elements and furniture in the studied zone with the current standard? So we tend to answer to the above-said question after analysis of the derived data from the status quo and comparing them with the given standards.

II. RESEARCH HISTORY

In Iranian written history, no codified and separate background is seen about types of urban furniture and its development trend and the existing backgrounds have been derived dispersedly out of historical documents of the country about this subject. Whereas ancient civilizations in Iran have been dated from older time than in many parts of the world,

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especially European civilizations, which are pioneers today in respect of urban elements and furniture- so the appearance of the primary conditions of some of urban elements and furniture can be attributed to them [1]. Several studies and researches have been conducted about urban furniture in the country so some of them have been referred in the following.. Pakzad et al (1991) have analyzed and criticized some urban elements like urban furniture and its utilities in a book under title "urban furniture" [2]. In 2000, in an essay under title of "design of furniture", Seyed Reza Mortezaei has studied the regulations of design and topology of urban furniture[19]. Also in an article titled "dustbin an environmental element of urban furniture", Somlaz Hossein (2000) has dealt with design and topology of dustbins in terms of environment and healthcare aspect[6]. In 2003, Shohreh Khodabakshi has reviewed and compared the urban furniture in world countries with Iran in an essay titles as "casting a glance at urban furniture and spaces in other countries" [8]. In his MA thesis titled as "the review on problems and deficiencies of urban furniture with focus on pedestrian routes (case study: Tabriz city, in area between Abresan intersection with Shahid Beheshti Street)", Abolfazl Ghanbari has briefly explored the current standards for each of elements in urban furniture and their concordance with status quo throughout Tabriz city (between Abresan intersection with Shahid Beheshti Street). The results derived from this investigation show that a stark difference is seen in current condition of urban furniture within the studied zone from the prevalent standards whether in terms of construction, design, and topology and or of harmony with environment[14]. In a study which has been conducted by Ali Zangiabadi et al (2009) under title of "Analysis on spatial dispersion of sport furniture in city parks and its effect on citizens' satisfaction and welcoming (Isfahan city)", he investigated the rate of public welcoming and citizens' satisfaction with way of dispersion and distribution of these instruments throughout Isfahan city. The given results from this study suggest that some variables like residence zone, type of park, marital status, and the existing sport exercises at morning were effective in motive for application of sport furniture[10]. In another research, which carried out by Ali Zangiabadi and Nazanin Tabrizi (2009) under title of "spatial analysis of urban furniture within tourist zone in central district of Isfahan", the existing conditions and situations of urban furniture has been studied within the tourist zone at Isfahan central area by them from several aspects including topology, spatial dispersal, observance of aesthetic factors, cultural and social issues, and administrative challenges etc where they are exposed to numerous problems in this regard[9]. Finally, in their survey which has been conducted under title of "the review and study on satisfaction with standards of urban furniture (Area 2 of Zone 2, Tehran city)" by Katayoon Teimoorian and Parvaneh Zivar (2013), they have studied quantitatively and qualitatively the elements of urban furniture by means of GIS and SPSS software so that based on the conducted studies many weak points are found in planning for these elements within the given zone including lack of proper topology of various elements in urban furniture, environmental distortion caused by imbalanced distribution of elements etc[4].

III. THEORETICAL BASES

A. Definition of urban furniture

Some complementary instruments and accessories are needed in the space within buildings and constructions in order to organize urban life; equipments such as items of a house may provide the possibility for living with the space enclosed by stone, concrete, and glass. These segments regulate motion, inertia, recreation, and anxiety in the city and revive it. Urban items and equipments or furniture, street or outdoor furniture are some common terms for these facilities and utilities. These facilities are more well-known in UK as "street furniture" and in US as "public furniture" or "outdoor furniture" [20].

B. General regulations and criteria in design of urban furniture

The main principles, which should be observed in design and establishment types of urban furniture, are as follows:

1) Concordance (harmony): It necessitates observance of concordance and harmony with the environment for reaction and existent nature of location as well as its given performance.

2) To meet setting requirement: the prosperous and viable design is a dynamic design that permanently meets needs of its users and remove the functional requirements of this location and it is adapted to environmental adverse effects and stresses [15].

IV. THEORIES REGARDING URBAN FURNITURE

Theorist	Notes
Kevin Lynch	Provision of furniture with appropriate lighting for certain pedestrian routes and creation of more mobility in them may cause them to be more humanized and significant and give the identity to these locations [17].
Rob Krier	He considers urban spaces as an element in city structure that is enclosed, legible, and has several aesthetic features [23].
Lewis Mumford	He emphasizes on correlation, dynamism of thought and idea and aesthetic importance in urban spaces. He argues that design of spaces should provide facility to symbiosis and participation for public life [22].
Jahanshah Pakzad	Urban furniture is some objects, which have been stationed for comfort and ease, presentation of information, control of moves, protection and benefitting from providers in urban spaces [3].

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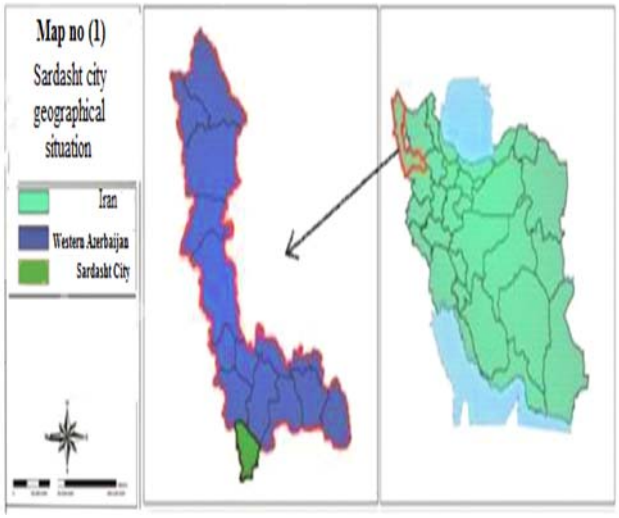
Ahmad Saeednia	Urban equipments (urban furniture) are a group of moving and semi- moving instruments and inseparable element in environment of a city that makes it possible to recognize and characterize the identity of a city. [11].
Ahmad Changizi	Urban furniture has usually logical compatibility and relationship with folklore, rate of dynamism, mobility, and distinct and historical characteristics of citizens and climatic features of the region [5].

V. Introducing the Studied Town and Zone

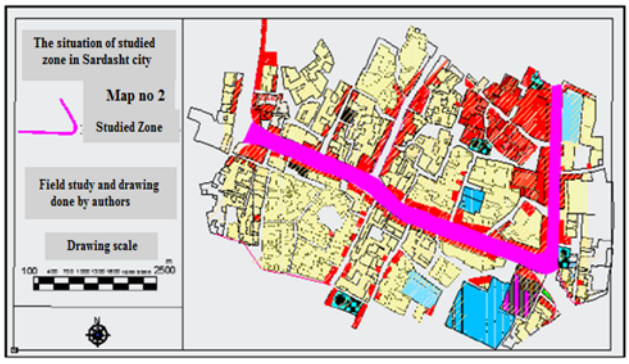
Sardasht city is situated at southwestern side of Western Azerbaijan Province (Iran). The center point of Sardasht town is located in geographical longitude (East: 45°, 32') and latitude (North: 36°, 9') with 1500m height above the sea level. Sardasht town is limited from the north to Piranshahr, from the south to Kurdistan province, of west to Iraq, and from the east to Mahabad and Bukan towns in Western Azerbaijan province [7]. According to the results derived from State public human and housing census (2006) this town has totally 105’569 people population out of them 37’699 are settled in Sardasht city and the rest inhabited in small town of this city and the rural regions [7].

Map no 1: Geographical situation of Sardasht city



Source: Website of Management and Planning Organization (MPO), Western Azerbaijan (2006)

Map no 2: The situation of the studied zone in Sardasht



Source of base map: (Sardasht guide plan approved in 2003: Sardasht Municipality), the studied zone drawn by authors

VI. 4- Methodology

This study is based on descriptive- analytical methodology. The data collection stage is at the beginning of a process during which the researcher gathers library findings and field study and then analyzes data. In documentary method (librarian) , books, essays, journals, theses, internet networks, and other written sources have been used concerning to the subject and in field method, information and data have been collected as a part of the existing condition of 4 items of the studied furniture in the zone by means of evaluation forms for each of furniture so in this method, an interview has been done with municipal beautification institution of the sampled town regarding the condition of the furniture in this zone and throughout the city. The information and data, which have been derived by field study through evaluation forms for each of the furniture in existing condition at this zone, were compared and adjusted with the current standards for urban furniture (which implied them in finding section) and in some of them lack of congruity was seen so by the aid of the current standards and by assuming the environmental and cultural considerations the adjusted model was presented in the studied zone and at the same time, spatial dispersions for each of furniture has been shown within the studied zone by means of GIS and AutoCAD software as maps.

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VII. RESEARCH FINDINGS

Table 1: The list and statistics of the studied furniture locating in Seyed Qotb and Vahdat streets at Sardasht city and their main applications

Furniture	Quantity	Main applications	Percentage of applications
Press kiosk	1	Residential	68
Mail box	4	Educational-cultural	10
Street lights	38	Commercial-servicing	15
Water taps	5	Recreational	7

Source: Field observations and the approved guide plan in year 2003

A. The comparative analysis on the current standards of street furniture with status quo in the studied zone

1) Press kiosk

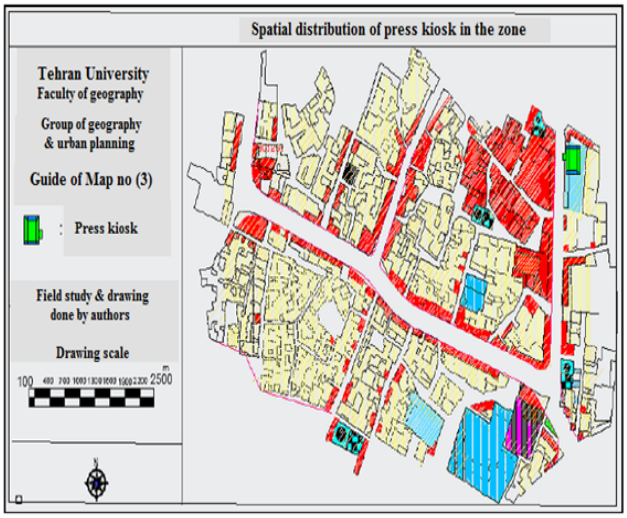
According to the conducted field studies and observations, there is one press kiosk within the studied zone that was explored and the following results were acquired from it:

The given press kiosk has been made of metallic prefabricated parts and as you observe in Map no (3), it has been located at rightmost of Seyed Qotb Street and 2m distant from curb ditch and it serves as barrier versus pedestrians in some hours during a day. It has 2.20m area in terms of spatial ergonomics in which it has a shade with 40cm width and a window with dimension 90×30cm which is used for communication with the customers and it has been installed as concrete foundation and it is located 50cm distant from the pavement level and it is white-colored so it is harmonized with the surrounding environment with respect to the current standards.

Table 2: The comparative analysis on press kiosk within the studied zone with current standards

Elements of urban furniture / Press kiosk	The current standards (Gibbons & Oberholster; 2001:184)	Status quo (field observations; fall 2013)
Materials	Iron, aluminum, fiberglass	Metallic prefabricated parts (iron, aluminum)
Topology	ocal economic potential raffic and transport situation: About 1m space has been considered during certain hours in both sides rather than 50cm for customer's limit on- violence from the pavement useful limit	igh economic potential of the location compared to other localities of city; osition of kiosk as barrier in pavement during certain hours a day; opology of kiosk in pavement 2m distant from curb ditch
Ergonomics	iosk space at least 2m² area ze of kiosk counter varies depending on type of use - Windows with dimensions 50×50cm for communication with customers; - Counter flour with dimensions 50×30cm 50cm width of shade Kiosk height maximally 2.20m from pavement level	space with area of 2×1.20m Width of kiosk shade: 40cm window with dimensions 90×30cm for communication with customers and without counter kiosk is installed as a concrete foundation and it is located 50cm distant above pavement level Kiosk is located 2.10m above pavement floor
Color	With respect to type of use and color of environment	White

Map no 3: The spatial distribution of press kiosk within the studied zone



Source of base map: (Sardasht guide plan approved in 2003: Sardasht Municipality

B. Mail box

With respect to Table-3 and based on the conducted observations and field studies concerning to the existing condition of the mail box within the studied zone, the following results have been derived:

Among 4 mail boxes in this area, as it shown in Map no (4), all 4 mail boxes were located in Vahdat Street and imbalance is seen in terms of spatial distribution in this zone and also all of these boxes are made of iron and their slots are approximately 1.20m distant from the pavement level and in terms of topology, they are located 50cm distant from cub ditch and adjacent to commercial, educational, and residential applications. As you see in Table (3), mail box are in cubic form and their color is composed of yellow and blue paints.

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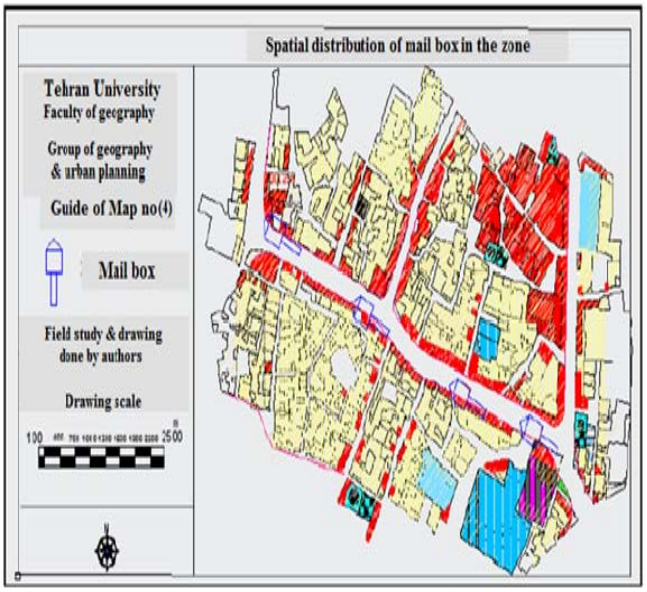
Table 3: The comparative analysis on mail box within the studied zone with current standards

Elements of urban furniture / Mail box	The current standards (Ghanbari; 2010:186-187)	Status quo (field observations; fall 2013)
Materials	Metallic sheets made of iron, cast iron, and steel	Iron
Ergonomics	-With suitable gradient for the handicapped and with the same level -100cm maximum height of slot from the ground level	-1.2m height of slot above pavement level
Topology	One mail box per one hundred people 2feet distant from the curbside Adjacent to important urban uses like bus transport terminals and close to public buildings with traffic	- Box is located less than 50cm distant from curbside. - Adjacent to commercial, residential, and educational uses
Form	Cylindrical, octagonal, hexagonal, circular	Cubic
Color	Yellow or red	Composed of yellow and dark blue

Map no 4: The spatial distribution of mail box within the studied zone



Source of base map*: (Sardasht guide plan approved in 2003: Sardasht Municipality)*

C. Street lights

There are 38 elements of street lights in both sides of the street within the studied zone out of which 25 items were studied and the following results were obtained:

The base posts of street lights were metallic and they had glass bulbs so distance between these posts varies from 5-8.5m and as you observe in Map no (5), these light posts have been installed in zigzag form. Also, total height of electrical post is 9mm and the street lights are installed in 5.5m height above the pavement floor.

Table 4: The comparative analysis on street lights within the studied zone with current standards

Elements of urban furniture / Street lights	The current standards (Ghanbari; 2010:190-193)		Status quo (field observations; fall 2013)
Materials	Posts	Metallic or wooden	Metallic posts with glassy bulbs
	Bulb	Glass	
Installation distance and topology	Depending on the needed mean lux unit for illumination or lighting of roads, lamp power, roads width, height of lights, repair and maintenance facilities etc.		Distance between lamps varies from 5-8.5m.
Installation order	- One-way, two-way, front, middle, hung in the middle - Mainly lamps installation is done one-way in pavements.		Installation in zigzag form
Form installation height	The height varies from 3 to 4m proportional to lighting in pavement squares, pedestrian streets and wide passages.		Total height of electric power post is 9m and the lamp is installed 5.5m above pavement level.

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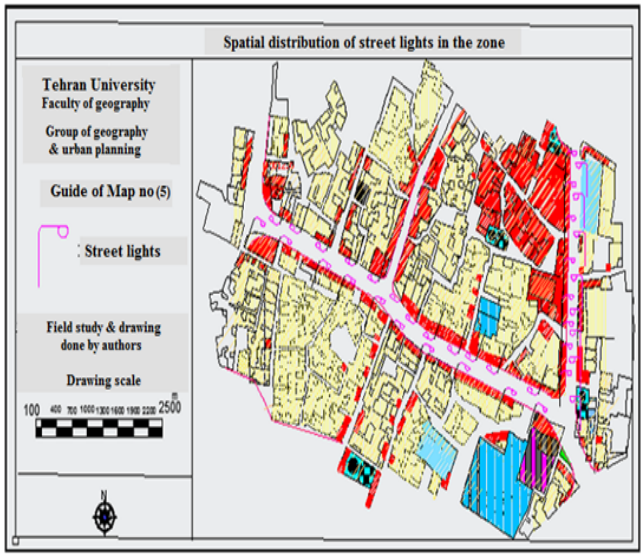
Map no 5: The spatial distribution of street lights within the studied zone



Source of base map: (Sardasht guide plan approved in 2003: Sardasht Municipality)

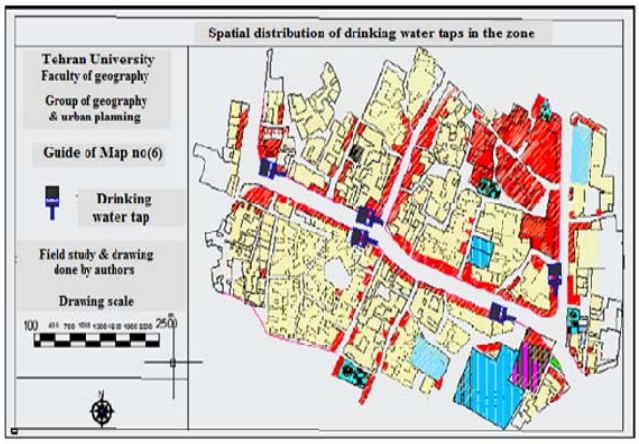
D. Drinking water tap

Of 5 drinking water taps in the studied zone, 4 elements were located in Vahdat Street and 1 element was installed in Seyed Qotb Street where based on the conducted field studies on their existing condition and according to Table no (5), some results may be revealed for us:

Drinking water tab units are made of steel and they are located 1.6m distant from pavement level and in terms of topology, the water taps in the studied zone are placed 5cm distant from curb ditch so as it shown in Map no (6), their spatial distribution is imbalanced.

Table 5: The comparative analysis on drinking water taps within the studied zone with current standards

Elements of urban furniture / Drinking water taps	The current standards (Ghanbari; 2010:186-187)	Status quo (field observations; fall 2013)
Materials	Concrete, fiberglass, steel	Steel
Ergonomics	- Height for the handicapped and adults is 86-90cm and for the disables is 74-76cm - Water discharge angle, selection of valve type, standing position of user, optimal access to water tap to make it possible not to wet the user are necessary.	Water tap is located 1.6m above the pavement level.
Topology	- Adjacent to ditch or orchard; - Not intruding for riding and pedestrians in pavement; - Ease of access to it - Creation of appropriate gradient to avoid collection of water - Not installing water tap in soil-covered lands and without pavement	- The studied water tap is located 5cm distant from ditch. - Inappropriate public access to drinking water taps - Their unsuitable distribution



Source of base map: (Sardasht guide plan approved in 2003: Sardasht Municipality

VIII. Discussion and Conclusion:

Whereas conditions in any town essentially differ from other cities in various regions of the country thus these criteria and standards may not be practically applicable for other cities since given this fact that several points in any country differ from each other in terms of climatic, natural, cultural, ethnic aspects and customs, ceremonies and traditions and each of these factors has been manifested typically in living of city-dwellers and their way of behavior therefore one cannot generalize regulations and standards for furniture in a city or country to other city and or country.

According to the conducted review and field studies regarding the existing standards for street furniture in the studied zone and giving answer to this question that to what extent does the situation of urban elements and furniture in the studied zone

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correspond to the current standards? The following results were derived which assumed comprehensible for us and they contributed us in presentation of applied and executive comments:

- The current situation of furniture in sample city differs from the common standards.
- Several errors are seen whether in stages of design, construction, installation, and topology of these urban elements within the studied zone.
- Shortage of press kiosks within the studied zone with respect to its traffic and centralization;
- Kiosk serves as a barrier or obstacle for pavement during certain hours during a day;
- Lack of suitable topology for urban furniture in the studied zone has led to lack of spatial integration (according to viewpoint from an expert in Sardasht municipality beautification department).
- Observance of the current standards in press kiosk in terms of ergonomics;
- Conceptual and visual considerations like size, color, form, texture, and aesthetics have not been addressed in design of urban furniture (according to viewpoint from an expert in Sardasht municipality beautification department).
- Great height from mail box slot to ground level;
- Small number of mail box in the studied zone;
- Great height for installation of street lights from pavement level;
- Lighting is not at appropriate level in pavement and only some of persons and institutes have installed street lights in front of their own shops or institutes.
- Urban equipments are not in harmony with natural- climatic conditions of the region (Beautification expert).
- Long distance between lamps in some points of the zone;
- Tangible lack of drinking water taps in Vahdat street;
- Great height of water taps compared to common standard;
- Lack of definition for appropriate width of street and pavement in this zone has created riding and pedestrian traffic.

IX. APPLIED SUGGESTIONS

- Supervision by municipality and beautification organization over topology and installation of any type of urban equipments and facilities;
- It necessitates topology and installation of at least 2 press kiosks in the studied zone due to high rate of traffic and crowding of studied region and high economic potential of this locality.
- Kiosk should be installed in such a way that does not obstruct passage for passer-by people.
- With respect to high size of population, number of mail box is low proportional to this population. A greater number of these boxes should be installed with observance of standards.
- The designed urban furniture should satisfy human's mind both in terms of performance and of aesthetic aspect (an expert in Sardasht municipality beautification department).
- The height of mail box slot should be adjusted to the current standards so that the people are able to use it.
- With respect to equestrian nature of this path, it is suggested to install street lights in 5m height utmost.
- This necessity is felt toward topology and installation of street furniture in the places where distance between them is high with lighting shortage.
- Factor of environmental sustainability should be noticed as one of the paramount agents in design, construction, topology, and installation of urban furniture (an expert in Sardasht municipality beautification department)
- Topology and installation of at least 3 drinking water taps in Vahdat street with respect to traffic in the given street compared to other streets in this city;
- Standardization of height of water taps from pavement level to use them by all social classes;
- Addressing aesthetic aspects in design and construction of drinking water taps within the studied zone (an expert in Sardasht municipality beautification department);
- Supervision of municipality and beautification organization in topology and installation of any urban equipment

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The study on economic- demographic performance and position of medium-sized towns in urban system and regional sustainable development of Eastern Azerbaijan Province

(*With focus on Maragheh Town, Iran*)

Rasoul Afsari[*1], Dr. Hamidreza Parsi [2],Rezgar Hamzepour[3]

***Abstract*—** The present article is intended to explore into the role and performance of medium-sized towns in urban system and regional development at Eastern Azerbaijan Province (Iran) with focus on Maragheh city. The methodology of this study is of descriptive- analytical type in which some quantitative models as well as Excel computerized software have been utilized. And also data collection has been done by means of documentation and library method. The results of demographic models may show that medium-sized towns and Maragheh city have enjoyed flexibility, population-attractive, and susceptive for migration and regardless of their demographic performance, imbalance may increase further in urban system of this province. The existing lack of residence in provincial urban hierarchical system within population groups (250-500 thousand people) and (500 thousands to 1 million people) has caused role of Maragheh and other medium-sized towns to become more downplayed in spatial balance and regular distribution of urban hierarchy at Eastern Azerbaijan Province. The economic models signify that Maragheh and other medium-sized towns of this province have basic conditions in Agricultural Sector. In sector of industry, all medium-sized towns have had non- basic status including Maragheh town. Among three economic sectors, economic growth in Servicing Sector is higher than the mean value of economic growth of town and province in Maragheh and the given province at this level. Eastern Azerbaijan province and Maragheh town are shared in terms of high growth at servicing sector and with respect to the susceptible backgrounds in this town in servicing and agricultural performances, in the case of improving of infrastructures, investment, and leading strategic plans in Maragheh town, this city may be purposed as a servicing and agricultural center for southern settlements in this province.

***Keywords*—** Medium-sized Town, Urban System, Regional Development, Population and Economy, Maragheh (town)

I. INTRODUCTION

Small-sized towns have been expanded with great speed and converted into big-sized cities during recent decades. This transformation is more acute concerning to cities in Underdeveloped or Developing Countries. Inter alia, urbanization growth in the world and all towns has not occurred uniformly, but this mainly included big-sized towns and capitals where in some countries up to 30% of population of the given country has been concentrated into metropolises [8] . So this has led to heterogeneity of urban network in these nations. Most of Developing Countries have witnessed emerging of metropolises, disparity and discontinuity in urban network in the land at general level, imbalanced distribution of facilities and opportunities throughout the regions, lack of equilibrium in settlement system and the like during recent years. Paying urban designers' attention to the occurred challenges led to take various strategies in the field of distribution of population in urbanization. Establishment of the organized networks from medium-sized towns was one of the paramount strategies; the networks which may be effective in expansion of development and coherent distribution of growth by benefitting from particular capabilities and certain population thresholds [19] .

The centroid of this theory is based on the concept of medium-sized town. Rondineli argues that medium-sized town may play noticeable role in integrated regional development. These towns may play crucial role in economic trends as the centers for giving services to smaller residential points and goods and services distribution centers [20]. Accordingly, it has been tried in this investigation to explore the role and importance of medium-sized towns in eastern Azerbaijan province in the regional development. But the given dimension for this study is related to demographic and economic dimension in medium-sized towns at this area. Namely, what role the medium-sized town may play in balance of regional development sector. It is because of the fact that economic role of medium-sized town of this region is one of much effective elements among medium-sized towns within urban system at any area so that other important components will be typically changed after modification of economic indicators. Also in medium-sized towns of eastern

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Azerbaijan province, especially Maragheh, if these towns can play effective role in regional economy, they will also play a very efficient role in balance of urban system at eastern Azerbaijan region. Demographic dimension is also one of the important factors, whether in terms of population distribution or of active workforce, in urban system at any region.

II. SUBJECT INTERPRETATION

The high demographic concentration and focused facilities in metropolises and emerging urban primate system and removal of balanced urban hierarchical system is one of the foremost bottlenecks in Third World Nations including our country i.e. Iran and this phenomenon occurred as a result of imbalance in distribution of various facilities and properties in territorial extent as well as ignorance of capabilities in small- and medium-sized towns. Accordingly, several strategies have been noticed to alleviate these problems one of which is to paying attention and attaching importance for medium-sized towns in creation of regional balances and employing of their capability in development of less-developed regions. Eastern Azerbaijan province is also not exception to this rule during recent half century and it enjoys accelerated urbanization growth and increasing the number of towns and its urban population with greater speed. Due to its cultural- tourism, and recreational attractions and strategic geographical, sociopolitical, and historical situation and owing to execution of industrial plans and public investments, Tabriz city has absorbed population and it has been expanded during several recent decades so it caused disturbing of regional equilibrium. Tabriz city is populated with 58% of total urban population and following to this trend, the regional economy also leads more to Tabriz in order to employ economies of scale toward further spatial concentration; therefore, development of small- and medium- sized towns in this province and guiding migratory flows toward these towns are some of important strategies for this purpose [10]since lack of balance and harmony in settlement of population arises from inappropriate and illogical trend of migrations to metropolises. In fact, with preparing the ground and providing the favorable conditions in terms of economy and population, they may succeed in establishing of a systematic and logical hierarchical system in a region [2]. Despite of having medium-sized towns with high potential such as Maragheh city, eastern Azerbaijan province enjoys the extensive rural influence area and high potentials but it could not yet use these potentials as position of these towns in urban system of the province. Thus, the primary studies regarding medium-sized towns in eastern Azerbaijan province indicate that it requires conducting some studies of this type and it seems that some of the problems of spatial system in this province may be resolved by improvement of medium-sized towns. Accordingly, it has been tried in this study to explore into the role and importance of Maragheh as a medium-sized town in regional development in eastern Azerbaijan province.

current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity in an equation.

III. RESEARCH QUESTIONS:

The basic research questions are as follows:
Given that performance of medium-sized towns including Maragheh, is important in regional economy and demographic system, have the provincial medium-sized towns the appropriate position from this aspect? If not, what are some solutions to improve their role?

IV. RESEARCH HYPOTHESES

Hypothesis I: It seems that provincial medium-sized towns, especially Maragheh, possess the needed potential for creating of balance in regional development and they may cause reduction degree of primate city in terms of economic and demographic aspect.

Hypothesis II: Apparently due to their link to several residences (high and low levels), the provincial medium-sized towns, particularly Maragheh, may play effective role in regional spatial development in terms of economic and demographic aspect and contribute to reduction of imbalance in the region.

V. METHODOLOGY

The methodology of the current study is of descriptive-analytical type and this study of applied- theoretical kind. Aiming at determination and interpretation the economic and demographic role and performance of medium-sized towns in urban system at eastern Azerbaijan region, initially the needed basic statistics have been extracted from information sources including Statistics Center of Iran (SCI), statistical compacted disks (CDs) (annual statistic journal, detailed results of public demographic and housing census etc.), and theses and researching essays etc as librarian studies and documentaries in this investigation and then they were computed and analyzed. The analysis is of quantitative type in this study and several statistical and econometric methods and models have been used for these purposes including rank-size rule model to study position and ranking of balance or imbalance of locations for provincial towns, Behforooz's adjusted urban rank- size model, Entropy Index model to analyze attributes of demographic spatial distribution in the provincial urban network, and the elasticity modulus model for study on rate of demographic elasticity at regional scale, and Location Quotient models in order to compare economic performance in city and province as well as Izzard's length- width equation to identify and predict city economic sectors with the region and also Shift- Share Analysis model to investigate the variance of growth in economic sectors of the town with other sectors econometric reference level.

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VI. NECESSITY AND IMPORTANCE OF RESEARCH

The ever-increasing growth of metropolises is one of the distinctive features of urbanism in Developing Countries, which indicates depth of illness in social structures in these nations [4]. According to UN report that was published in 1980, 71 countries or 62% of total 114 Developing Countries believed that distribution of their population was unreasonable while 24 countries (or 20% of them) also announced distribution of their national population as irrational to some extent and they have considered that it necessitated intervention and policy-making [4]. In fact, with attraction of more population, the big-sized towns have always acted as the main barrier against comprehensive and integrated socio-economic development in Developing Countries and among them, small- and medium-sized cities have played marginal and ineffective role all the times.

Also in Iran, along with the accelerating urban growth that started since 1966 and at the beginning of agrarian reforms and it was followed by economic and demographic deep changes and gaps among the big-sized cities and small- and medium-sized towns, the population settlement model and biological centers did not in fact follow up the exploitation system that was proportional to the existing capacity and potentials so the sketch of population settlement might show an distorted image and the model of imbalanced distribution in urban centers has had inhibitory impact on urban development trend [5]. As it seen after Tehran city, the national space has been organized surrounding several regional metropolises, which introduce technical, economic, and political services in respect to lower-sized towns. Therefore, with their linking to higher orders of Iranian urban system, network of medium- and small-sized cities have still kept their organic relations with rural and agricultural community and they are manifested as outskirt and marginal areas in Iranian urban system network [8]. The fast growth of metropolises in our country has led to emerging of some problems like shortage of housing units, economic problems, poverty, outskirt settlement, and environmental pollution during recent years, this issue has caused inequality and disparity of services and facilities at national and regional level per se. Accordingly, most of researchers maintain that the basic plans should be prepared with focus on dynamics of small- and medium-sized towns since with the existing similar facilities and services in medium-sized towns, inadvertent immigrations to megalopolises will be avoided at regional level and the immigrants will select second-order towns for their living. In fact, development and improvement of medium-sized towns is a policy that is consistent with decentralization objectives and it creates some conditions in the long run, which strengthen production activities inside these centers [12].

Rondineli also considers the following factors as the reasons for pay attention to medium-sized towns in regional development more than ever:

1. Medium-sized towns may reduce the problems like housing, transportation, employment, and providing utilities and services in the biggest cities.
2. The medium-sized towns may regional inequalities and expansion of facilities and services and also the existing inequalities in medium-sized cities.
3. The medium-sized towns can reduce administrative concentration in metropolises and prepare favorable ground for public and private investors in medium-sized towns and other cities.
4. They create investment in small- and medium-sized towns for the unemployed and rural immigrants and as a result they cause reducing of poverty.
5. The medium- sized towns create mobility and dynamism in rural economy with creation of facilities and market for farming crops in rural areas.

The medium-sized towns in eastern Azerbaijan region, particularly Maragheh town, have a lot of abilities and potential capabilities. But due to concentration of facilities and services in Tabriz as capital city, the other cities have retarded from competition in this trend with this city. Ignoring the role and position of medium-sized towns, especially in terms of economic and demographic aspects, may exacerbate urbanization problems and centralized distribution of people and activity and dichotomy in spatial development.

The medium-sized towns may introduce better living conditions, job, and environment with lesser population to rural population and they act as local markets for their products. Likewise, these towns not only provide social services and infrastructures for urban population but also for rural and regional populations [18]. As a result, with accepting a noticeable share in production factors, investments and manpower and national population within intervals proportional to land extent, the medium-sized towns may act as a few balancing weights away from gravity and centrifugal force and they become able to establish a group of necessary agents to cultivate areas of land. By doing so along with reducing differences among the center point with its surroundings, one could achieve harmonized equilibrium throughout the land [8].

VII. RESEARCH HISTORY

The idea and subject of study on the effect of performance of medium- and small-sized towns at regional and local level may be probably started and purposed for the first time by work of Johnson (1970) and in subject of “rural development center” by Fanel (1976) [21]. Filho argues that the role and importance of small- and medium-sized towns has been more noticed since 1970s. The main motive in study on medium-sized towns in its modern form should be found in post-war Europe, when the requirement for taking a new approach toward planning and survey of land was purposed and it was aimed at balanced distribution of activities, wealth sources and population at national and regional levels. To decentralize and create more balanced urban system, the policy for

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strengthening of medium-sized towns was posited for the first time in French sixth socio-economic development plan (1971-75) for decentralization and establishment of more balanced system and it was utilized for the cities during 70s.

Rondineli, as the main founders of strategy for medium-sized towns, in cooperation with Rudel in 1987, provided a deep and extensive discussion concerning to writing of book under title of "Urban performance in rural development" [19]. In this book, creation and improvement of small- and medium-sized towns has been considered as pivotal theme by linking the performance with rural areas in order to succeed in diversifying the economy, industrialization, giving supportive services, and commercialization of agriculture, and finally organization and development management. Rudel also deems developing of small- and medium-sized towns as an appropriate method for spatial development and creating of economic growth and social balance and argues that the investments should be led from metropolises toward small- and medium-sized towns [10] . Likewise, Alonso considers development and improvement networks from medium-sized towns as appropriate for completion of urban network, which have been already manifested in receiving more population by them [7] . Friedman and Douglas have suggested Agropolitan development with taking spatial approach and they have considered the correlation between cities and villages and familiarization of local people with urban life as a requisite for regional development [4] . Harvey and Sautherdoit (1986) have written a book called "The role of small- and medium-sized towns in national development in Third World" where their findings are briefly as follows:

- Heterogeneity of small- and medium-sized towns with metropolises
- The severe shortage of researches and study sources regarding small-size urban centers in Third World
- The important and key role of small- and medium-sized towns in administrative, political, and military control of the region
- The strong and deep relationship among agriculture and rural development with development of small-sized urban centers
- The strong impact of transportation modern systems on development of urban centers [12].

Claus Kanzman deems supporting and improvement of medium-sized towns as a key for success in policy for regional planning. He writes: "Review on results of regional development plans may indicate that most of these objectives have not been realized. The reasons of this failure include: International dependencies, financial problems, economic and matrix focus, dearth of efficient and specialist manpower, and at last forgetting the basic needs and ignoring decentralized techniques" [15].

VIII. RESEARCH THEORETICAL BASES:

A. Definitions and key concepts

1) Urban system

The urban system is considered as arrangement of towns that has been expanded within certain geographical space in interaction and action and reaction with each other through demographic dynamics, flow of goods, thoughts, and giving services and it results in forming an integrated functional and structural system [14]. Therefore, this urban network comprises of mutual relationship among urban centers and their exchange system that emerges among the towns regarding their technical performance. Due to governing a centralized system in most of countries, the role and importance of small- and medium-sized towns is lesser but it is greater in metropolises. For this reason, through removal the role small- and medium-sized towns in those countries the urban network is in chain and continuum form particularly in Third World Countries; in contrast, this network is in two homogeneous and galactic forms in advanced industrialized countries [3] .

2) I- I I- VII - Primate City

In hierarchical system of towns in a country, the greatest city or its capital is ranked at the highest order in terms of enjoying special features so this town is called "Primate City". In 1939, the primate city (dominant city) was purposed by Mark Jefferson in a paper under title of "Rule of primate city". The primate city may affect on other towns of a country in terms of population or performance. In other words, primate city is called to a town, which has twice population of the second greatest city of a country. To explain the phenomenon of very great cities in which the major part of population and economic activities of the countries have been focused and were often as capitals of these countries, Jefferson called these cities and primate cities and this phenomenon as primate city. According to his view, compared to urban system in Developed Countries, the primate city (greatest town) in urban system at Developing Countries is extremely greater than second and third metropolises in these countries. Dukakis Smith deems primate city as demographic, economic, social, and political dominance of a city over all other towns inside an urban system. In this regard, Dublidge declares that primate city means the greatest city in a country and the foremost representative for national culture and it has been placed at the highest order of urban hierarchy of that country as the position of a dominant urban location in the given country and it is also its capital. Based on definition by United Nations, the characteristic of primate city is the high centralized urban population of countries is focused in a city or urban system. In addition to referring to hierarchical system in many cities at South America and Africa, Dickinson considers primate city as a sign of urban imbalance. In fact, it is usually focused on this point that such a phenomenon has occurred in Developing Countries and it often emerges at regional scale. Thus, it should be considered as a very important issue (blogfa.com). Also like many developing countries in Iran, due to special governmental policies, one can observe lack of urban

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equilibrium and imbalanced spatial distribution of population in many regions and provinces of this country so that the capitals of provinces have macro cephalic status compared to other towns and they have created phenomenon of primate city throughout these areas. It should be noted that of course that phenomenon of primate city will be catastrophic in a country with simple socioeconomic structures when its economic, social, and political facilities are concentrated into a single urban point andunder some circumstance, such a point may act intolerantly as a burden on urban system and create many barriers against regional development of that country. From this point of view, B.F. Haslets calls these towns as "parasite cities". According to his view, unlike a productive city, the parasite city hinders economic growth in its surrounding regions.

IX. Concept of Middle of City (medium-sized)

There is no accurate definition from small-, medium-, and big-sized cities. For this reason, the minimum and maximum thresholds are employed to determine and identify small-, medium-, and big-sized cities [12]. Like some concepts and terms, medium-sized cities are a relative concept since they depend on development order and level and spatial and economic structure of a country and consequently this varies from one region to other area inside a country. There are some criteria to identify size of a city, which often include quantitative load but the qualitative load may be embedded in or added to them. Demographic index is the most common indicators for ranking of cities. Although demographic size of a city may not denote the role that it plays, it can signify performance and role of a city in urban network and its surrounding area [9]. The size of middle of city in any country is measured by size of the biggest and smallest city at the same land so the relative size is mainly considered for this population. Rather than counting of population in identifying the average order (rank), some other factors may be employed including economic efficiency, major economic activities, employment composition, urban density, physical level of urban life, ratio of the employed workforce in non-agricultural jobs, income, and cost as well [7]. Some of the most frequently used terms about Middle of Cities are as follows: medium-sized cities, interfacial towns, medium-sized cities, and secondary cities.

X. Performance of Medium-sized Cities

Due to importance of two criteria of efficiency and effectiveness and justice in theories of urban policy-making and codification of urbanization strategies, the paradigm of medium-sized cities is based on this belief that it may consider both criteria at the same time since on the one hand, development strategy in medium-sized cities may contribute to reduced regional inequities, creating of opportunity to develop the retarded regions, and extending the level of exploitation throughout the land and on the other hand it can help to enhancing of efficiency level by reduced congestion costs that occurred in metropolises. François Peru and Digger Andrade have shown a model of theory based on which economic growth is substantially imbalance and incoherent. Therefore, a condition should emerge where small centers can grow as well and act as pole of center [22]. The medium-sized cities may cause urbanism and leading immigration of rural people to their own, reduction of problems in metropolises, dynamism of rural-regional economy, decreased regional difference and inequalities, increased capability of administration system, reduction of urban poverty, and contribution to providing basic needs in rural communities and cities, and economic urban dynamics, and developing of innovations [9]. The medium-sized cities may link economic growth to justice and welfare at urban and regional scales and cause transferring development to their lower level [23] . The regional distributive equity emerges by creating income for immigrants in medium-sized cities and through preparation of conditions for transferring revenue of the immigrant rural people to the origin [24].

XI. The Studied Region

With over 2'186sq.km of area (4.8% of total provincial area), Maragheh is situated 130km distant from Tabriz city and it is limited from the north to Tabriz town, from the eastern side to Bostanabad, Hashtrood, and Charoymagh towns, from the west to Bonab, Ajabshir, and Malekan Varzaghan towns, and southwardly to west Azerbaijan province. According to the results of public human and housing census in 2011, population of Maragheh city is approximately 247'681 (6.7% of total provincial population) and population of center of this town has been estimated 162'275. The urban and rural populations of this town are 163'859 and 83'822 respectively with 70'546 as number of families.

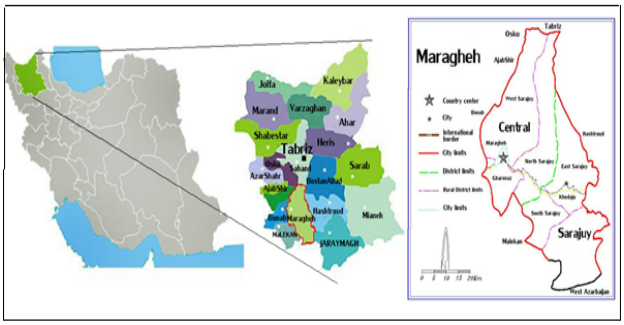

Fig 1: Geographical situation of Maragheh city in eastern Azerbaijan province

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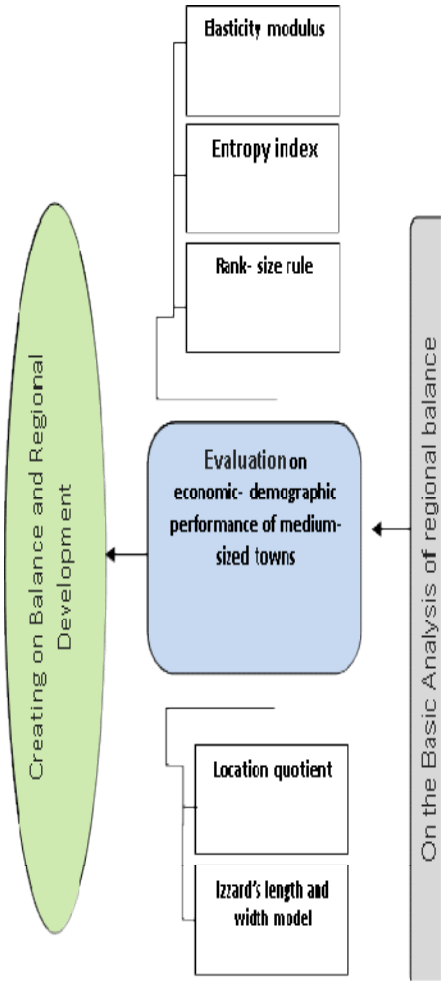
XII. RESEARCH MODEL AND PARADIGM TO ACHIEVE REGIONAL EQUALLIBRIUM



XIII. DISCUSSION AND CONCLUSION

Today, purposing a comprehensive definition is difficult task that can apply to urban geographical divisions for all cities throughout the world. But this is unanimously agreed that many experts consider "population relative size' as the main factor in determination of city size. Demographic size of cities and their classification vary in several countries. It can be implied in fact that with respect to geographic factors and size of the biggest city and various methods of its planning, any country may measure size of the cities. In studies on Land Survey Plan (first phase) in 1985, to determine size of Iranian cities, they were classified based on factor of population into five categories as follows: small cities (less than 50'000 people), small to medium sized cities (50-100 thousand people), medium to big sized cities (100-250 thousand people), medium metropolises (250-500 thousand people), and metropolises and megalopolises (500 thousand to 2 million people) [13] . Accordingly, the medium-sized cities are those towns, which have population 50-250 thousand people. The number of cities and urban population is going to increase in eastern Azerbaijan province at each phase. And quantity of cities from 30 towns in 1986 has reached to 50 cities in 2011. According to urban population and number of cities and through overall investigation of urban growth trend in this province during years (1986-2011), it is observed that most of cities in this province are included in cities with less than 10thousand people population that is the connection link between villages and higher orders of urban network hierarchy.

Table 1: Classification of size and quantity of cities in eastern Azerbaijan province in years (1986-2011)

Classes (thousand people)	Year 1986		Year 1996		Year 2006		Year 2011	
	Population	Number of city	Population	Number of city	Population	Number of city	Population	Number of city
Less than 5	19265	5	25784	7	68475	22	59419	20
5-10	79151	10	97716	13	93230	13	122966	17
10-25	110287	7	147615	10	190300	12	158829	10
25-50	105827	3	94192	3	134538	4	193787	6
50-100	199498	3	315816	4	4	3	268007	3
100-250	100679	1	132318	1	264770	2	286598	2
250-500	-	-	-	-	-	-	-	-
500-1000	971482	1	-	-	-	-	-	-
1million and more	-	-	1191043	1	1398060	1	1494998	1
Total	1586189	30	2004484	39	2423881	57	2579178	59

Source: Statistics Center of Iran, the detailed results from Public human and housing census in years (1986-2011)

XIV. EVALUATION OF SOCIAL (DEMOGRAPHIC) PERFORMANCE OF PROVINCIAL MEDIUM-SIZED CITIES WITH FOCUS ON MARAGHEH CITY

Rank- size rule model

Zippev argues that the existing correlation among population of cities and their ranks is purposed as a straight line with linear correlation. Thus, as size of urban system develops in a country, it approaches more to normal distribution. The mathematical expression of this concept may be implied as follows:

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$$\Pr = \frac{p}{R^{\frac{1}{b}}} \quad (1)$$

Pr: City population in the given rank or population of R th
R: City rank in the region;
b: Slope of rank-size line [14].

According to rank-size urban model, we review cities of eastern Azerbaijan province in 2011 once for computation of statistics in Maragheh city and the other time without considering Maragheh city in order identify balanced or imbalanced position and ranking of their establishment. If provincial cities are ordered based on population then the second city of province should be one half of population of first city and also population of third city should be set as one third of population in first city and so forth.

The studies indicate at level of eastern Azerbaijan province that population of first city in this province in 2011 is 9.2 times greater than population in the second city, 12 times of population in third city, 15.7 times greater than population of fourth city, 16.1 times of population in fifth city, and 1181 times greater than the last lower population in this province. In this section, trend of variance of the first city in eastern Azerbaijan province in respect to Maragheh city in years 1986-2011. As it can be concluded, the maximum rate of index for the primate city in 1986, this rate is 9.5 times of Maragheh city. This trend is in descending trend since this year but from 1986 it can be seen that this rate had ascending trend again and it has reached to 9.3 times of Maragheh city. So these trends signify the intensification of macro- cephalic phenomenon. This above superior feature has been intensified in this province and or fixed at these figures (Table-2).

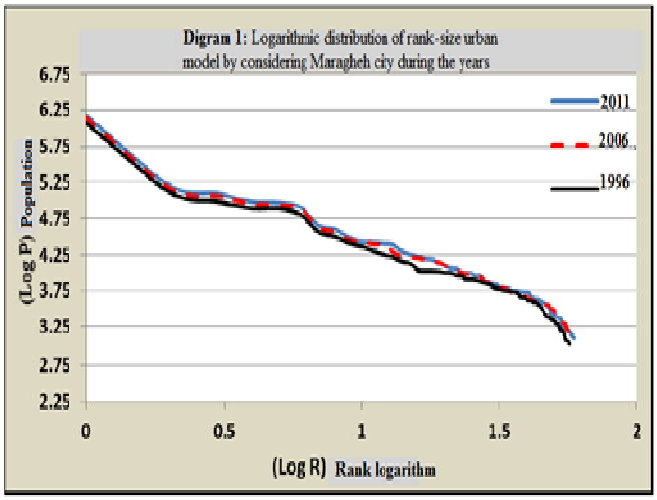
Table 2: Variance trend of primate city in eastern Azerbaijan province (1986-2011)

Year	1986	1996	2006	2011
Population of first city	971482	1101043	1398060	1494998
Population of second city (Maragheh)	102724	132318	149929	162275
Suitable population	183862	223158	259894	276546
Deviation of suitable population from real population (variance)	81138	90840	109965	114271
q-value	3.24	3.17	3.22	3.20

Source: Statistics Center of Iran and research findings

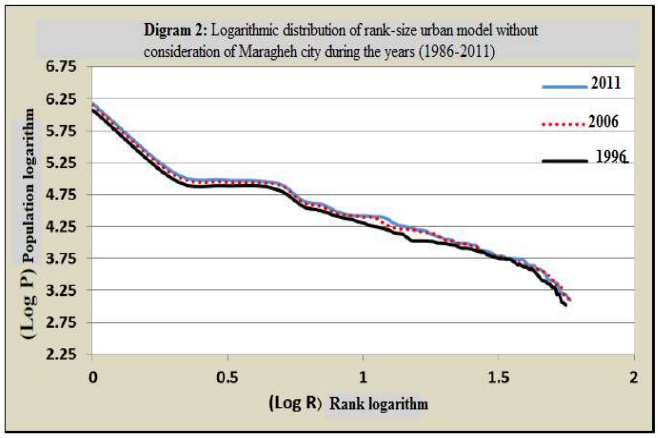
Although population of provincial cities has increased during these years, the gap has been increased in hierarchy among megalopolis of Tabriz and other cities. According to rank-size rule for urban size the slope was 1.41 by considering Maragheh city in 1986 while this rate was -1.43 in 1996, and the slope has increased to -1.44 and -1.47 in years 2006 and 2011 respectively and the breakdown angle became greater with the first city (primate city).

The value of slope (or tangent) of rank-size line in respect of balance line was -1.41 and -1.43 for years 1986 and 2011 respectively. Namely, lack of balance in slope of regression line is seen in urban system and network at eastern Azerbaijan province where the derived numbers showed dominance of primate city over provincial urban network. And in other words, lack of urban centers with 250-500 thousand as well as 500-1000 thousand populations have increased the intensity of imbalance among primate city and the existing cities in this province (Diagram-1).



Source: Research findings

The value of slope (or tangent) of rank-size rule model was -1.42, -1.38, -1.30, and -1.42 respectively without considering of Maragheh city during period 1986-2011. Compared to table of logarithmic distribution and by considering of Maragheh city, it is seen that this lack of balance remains in slope of regression line regardless of Maragheh city so it can be concluded that Maragheh city plays very lower role in balance of this slope and this lack of balance was very greater in the borderline among primate city and second and third cities and that was because of the absence of intermediary cities with population of 250-500 thousand and 500 thousand to 1 million people in urban system of provincial network (Diagram-2).



Source: Research findings

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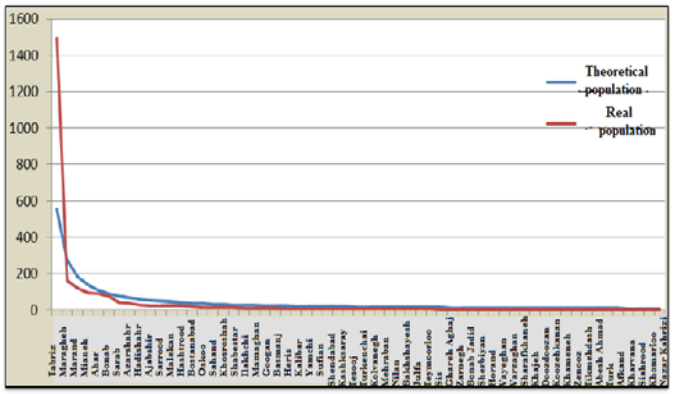
XV. BEHFOROOZ'S ADJUSTED RANK-SIZE MODEL

To achieve a balanced hierarchical system in the field of provincial urban system, Behforooz's adjusted rank-size model has been utilized in which fulfillment of these goals required taking regional long-term strategies and severe decentralization from Tabriz city. The results of this model may indicate that Tabriz city has 941\907 people surplus population while the shortage of population is seen in second cities of Maragheh, Marand, Mianeh, Ahar, and Bonab with rates of -114'271, -60'041, -42'786, -18'010, and -12'288 respectively in order to be placed within the regional hierarchy. Maragheh city has not balance demographic balance in all phases of census. But Maragheh city is also highly distant from its suitable rate of population and based on Behforooz's rank- size theory, this town has 114'271 people shortage of population in 2011 (Table-4).

Table 4: Population of Maragheh medium-sized city based on Behforooz's adjusted rank-size model during years (1986-2011)

Year	Behforooz's adjusted rank-size model		
	Real population	Theoretical population	Population shortage
1986	102724	183862	81138
1996	132318	223158	90840
2006	149929	259894	109965
2011	162275	276546	114271

Source: Research findings



Source: Research findings

XVI. ENTROPY INDEX MODEL

This model is a criterion for measurement of uniformity of the given variable (e.g. distribution of population) in cities at one region. So with employing this model, one could identify the rate of spatial balance of settlement of population throughout urban, regional, and national networks. The formula of entropy index is as follows.

$$H = -(\sum Pi - LnPi) \quad (2)$$

H: Absolute entropy

Pi : Frequency

$LnPi$: Neper logarithm of frequency

$$G = \frac{H}{LnK} \quad (3)$$

LnK : Neper logarithm of the rate of classes (number of cities)

G: The relative entropy index [12].

The results of entropy index model in eastern Azerbaijan province suggest that entropy index reflects lack of balance in provincial urban network by considering all cities of this province for years (1986-2011). To measure the impacts of medium-sized cities more accurate in dispersion of population in this province as well, this action has been studied once with consideration and one time without taking them into consideration. The results show that if demographic performance of medium-sized cities is ignored, eastern Azerbaijan province recedes from balance of equilibrium of population in its urban centers in all four time phases namely 1986, 1996, 2006, and 2011 while this quotient has reduced without consideration of Bonab city for all years and it reveals more imbalances in provincial urban system (Table-5).

Table 5: The rate entropy in eastern Azerbaijan province with and without consideration of Maragheh (1986-2011)

Yaers	1986	1996	2006	2011
With consideration of cities in province	0,523	0/509	0/500	0/505
Without consideration of medium-sized cities	0,430	0/385	0/390	0/381
With consideration of Maragheh city	0/498	0/492	0/482	0/488

Source: Research findings

Diagram 4: The rate entropy in eastern Azerbaijan province with and without consideration of Maragheh (1986-2011)

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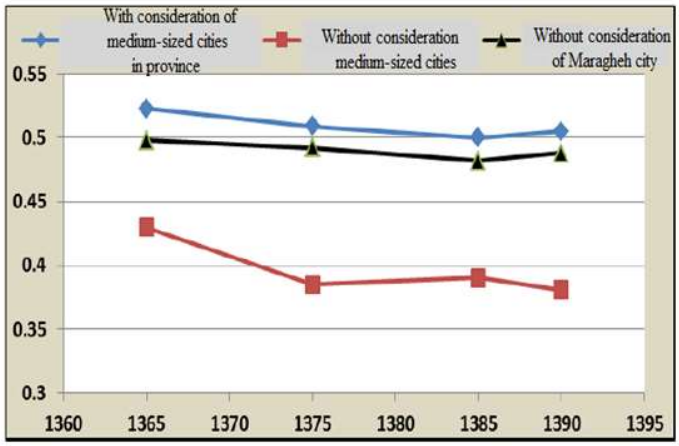

Source: Research findings

XVII. ELASTICITY MODULUS MODEL

This model is a parameter thereby one could estimate percent of urban inhabitants population versus total population. Namely, to what extent the urban inhabitant population (the given city) may increase or decrease against every percent of increase in total population (country, province, and town). When the elasticity modulus of population in the studied cities overtakes the regional or provincial coefficient this may be the reason for the presence of anti- centralization trends at this region and the gradual growth in medium and small- sized cities. Likewise, the existing tendencies in the regional space as well as the rate of their demographic elasticity can be calculated by this index and they can be compared with other demographic centers in contrast to the region. The formula of this coefficient is as follows:

$$E(t,t+10)=\frac{Y_u(t,t+10)}{r(t,t+10)} \quad (4)$$

The rate of elasticity was derived by elasticity modulus model and also the demographic attraction potential of provincial urban points and medium-sized cities including Maragheh as a medium-sized city was studied compared to the province while the given results indicate that during years 1986-2011 among medium-sized cities the elasticity modulus is higher than unit (1) only in Marand, Bonab, and Maragheh cities in general status and these cities have the maximum rate of elasticity, attraction of population, and susceptibility for immigration in eastern Azerbaijan province during these years. The main reason for this point is also related to this fact that following of the urbanization trend, reduction of population in some villages of town and expansion of servicing activities has caused by entering investment into this sector. Among them, the elasticity modulus for Maragheh reached to less than 1 during decade (1996-2006) and it was the maximum rate for decade (1986-1996). As general, the rate of elasticity modulus of Maragheh medium-sized city is 1.05 for time intervals (1986-2011) so this suggests flexibility, attraction of population, and susceptibility of Maragheh city to receive immigrants (Table-6).

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Table 6: The comparison of urban population growth rate and elasticity modulus in Maragheh with medium-sized cities in eastern Azerbaijan province during years (1986-2011)

Year and city growth rate	Urban population growth rate				Elasticity modulus			
	1986-1996	1996-2006	2006-2011	1986-2011	1986-1996	1996-2006	2006-2011	1986-2011
Maragheh	2.56	1.26	1.58	1.8	1.31	0.73	1.27	1.05
Marand	3.05	1.77	1.59	2.2	1.56	1.02	1.28	1.29
Mianeh	1.70	1.40	1.23	1.5	0.87	0.81	0.99	0.88
Ahar	2.31	1.06	1.30	1.6	1.18	0.61	1.04	0.94
Bonab	2.42	1.94	0.84	1.9	1.24	1.13	0.67	1.11

Source: Statistics Center of Iran, public human and housing census in years (1986-2011)

XVIII. Evaluation of Economic Performance of Provincial Medium-Sized Cities with Focus on Maragheh City

In this section, we evaluate economic performance of provincial medium-sized cities with focus on Maragheh city by means of Izzard's length- width equation and shift-share analysis models.

Location quotient model

Location quotient is one of methods of regional analysis and exploration the quality of its relationship with other regions. A simple diagram of basic economic theory has been purposed in the following that it typically reflects impact trend of basic activity in general structure of urban or regional economy.
The general structure of this model is as follows:

$$L.Q = \frac{\frac{TNi}{TNa}}{\frac{CNi}{CNa}} \qquad (5)$$

$L.Q$: Location quotient

TNi : Number of the existing workforce in sector *i* in city

TNa : Total number of the existing workforce in the city

CNi : Number of the exiting workforce in sector *i* in throughout the country

CNa : Total number of the existing workforce throughout the country [14].

If L.Q>1, the city is exporter of that good and services and that sector is included in basic activities. If L.Q<1, the city is importer and that sector is considered as non- basic activities. If L.Q=1, the city is self-sufficient [14]. In location quotient model in which basic or non- basic nature of economic sectors is identified in the city, the number greater than unit (>1) denotes the basic conditions of economic activity and exporting potential of the city in the given province and the figure that is smaller than unit (<1) shows non- basic conditions of economic sector while if this number is equal to unit (=1) this indicates self-sufficiency of the city in that economic activity. Regarding the agricultural activities in Maragheh city and other medium-sized cities of this province, this number is greater than unit (>1) so it possesses basic conditions and rate of this quotient has reduced slightly in comparison of 2011 to 2006. And in industry sector, location quotient of Maragheh and all medium-sized cities were lesser than unit (<1) so that except for Maragheh, Ahar, and Bonab cities, rate of this quotient has reduced compared to 2006. Also in servicing sector, except for Bonab city which had basic conditions and acted as exporter of services within its influence field in this sector, percent of location quotient in other medium-sized cities has decreased compared to 2006 and it is smaller than 1. So this suggested the inappropriate distribution of facilities and services among cities of the province and their focus at center of the province and greater tendency of people to urbanism and utilization from the existing sources and facilities in metropolises (Table-7).

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Table 7: The comparison of location quotient variances or Maragheh basic economic with medium-sized cities in eastern Azerbaijan province during years (1986-2011)

City	2006			2011		
	Agriculture	Industry	A. Services	Agriculture	Industry	B. Services
Maragheh	1.38	0.81	0.98	1.31	0.86	0.96
Marand	1.11	0.98	0.96	1.24	0.91	0.95
Miyaneh	1.45	0.72	1.02	1.65	0.64	0.96
Ahar	1.48	0.89	0.86	1.48	0.97	0.80
Bonab	1.34	0.76	1.04	1.30	0.77	1.03

Source: Research findings

XIX. IZZARD'S LENGTH AND WIDTH MODEL (EQUATION)

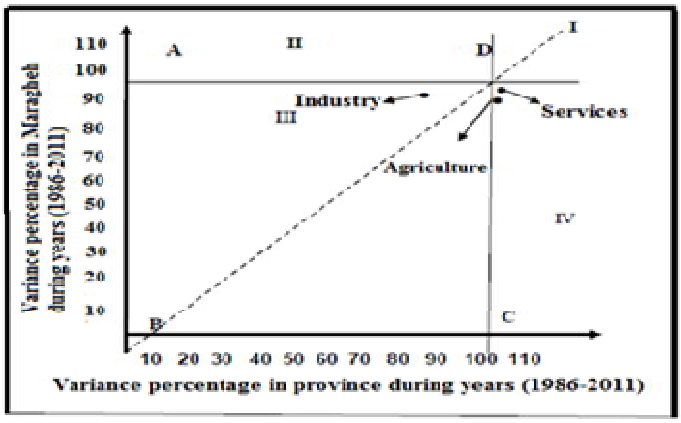
According to Izzard's length and width model, the comparison among the results of economic performance in eastern Azerbaijan province and Maragheh city show during period (1986-2011) that as general, the growth in agriculture sector of Maragheh as a medium-sized city is lesser than the mean economic growth of the town while it had the growth rate higher than the average value of mean economic growth throughout the province. This difference in percentage is 2.50% for Maragheh and 3.5% for the region. The industry sector has growth rate smaller than average economic growth in this region as well as in Maragheh city. This difference in percentage is 1.30% for Maragheh city and 2.1% for this region. The growth rate of servicing sector is greater than both mean rates of town and province and in servicing sector of Maragheh city; this rate is 2.20% higher than the average rate of growth in the town and it is 3.90 for the province. Among three aforesaid sectors, servicing sector has the highest rate for Maragheh city so this can be considered due to historical and touristic situation and academic climate of Maragheh city. Eastern Azerbaijan province and Maragheh city are common in terms of higher growth in servicing sector (Table-8).

Table 8: The comparison of location quotient variances or Maragheh basic economic with medium-sized cities in eastern Azerbaijan province during years (1986-2011)

Economic sectors	Maragheh			Province		
	Thousand employed (2006)	Thousand employed (2011)	Variance percentage (1986-2011)	Thousand employed (2006)	Thousand employed (2011)	Variance percentage (1986-2011)
Agriculture	21928	20581	3.93	237170	239858	1.101
Industry	22628	21380	5.94	415485	380204	9.90
Services	32600	31946	0.89	499566	507307	5.101
Total	77156	73907	8.59	1155221	1127369	6.76

Source: Research findings

Diagram 5: The condition of economic sectors in Maragheh city and eastern Azerbaijan province during years (1986-2011)



Source: Research findings

Diagram-5, which drawn based on the information from Table-7, suggests that agriculture and servicing sectors were higher than average economic growth at national level and lower than average economic growth at regional level. The industry sector was at lower level both throughout urban regions in eastern Azerbaijan province and in sector of Maragheh city compared to average economic growth in this sector. In general, it can be concluded that there is lower consistency and balance among economic growth in Maragheh city compared to average economic growth at urban points of eastern Azerbaijan province and at the same time the average economic growth in Maragheh has been 1.80% lower than average economic growth in this province during this decade.

XX. SHIFT- SHARE ANALYSIS MODEL

Shift- share analysis technique surveys variance of growth in economic sectors of the city compared to the growth rate at reference level of economy. This difference may be positive or negative and it denotes location shift or displacement of urban economic share in the reference economy. This model denotes the reference scale for the country where town or province is measured compared to this scale [14] .
The general shape of this model is as follows:

$$A = \frac{E_R^{75}}{E_R^{65}} - 1 \qquad (6)$$

In analysis of economic structure of Maragheh city and other medium-sized cities of the province compared to its urban points and during years (1986-2011), the urban economy in this province had negative coefficient (-0.0241) consequently it had descending trend. The detailed and separated exploration of sectors indicates that during the given decades,

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agriculture sector and its performance had descending trend and its coefficient was negative (-0.0674). Also performance of this sector had descending trend in Marand and Mianeh while all the rest medium-sized cities had ascending trend including Maragheh. Servicing sector has ascending trend throughout the province and in all medium-sized cities and its coefficient is positive (0.0369) and performance of this sector is positive for all medium-sized cities (Table-8). Inequality and lack of balance in optimal distribution of facilities as well as focus of facilities and services in single dominant city of province (Tabriz city) and administrative- political central nature of Tabriz city has downplayed the role of medium-sized cities in urban system and regional development of this province. Appropriate geographical distribution in medium-sized cities of the province, including Maragheh and Bonab at southwest of the province, Marand at northwestern side of this province, Mianeh from southeast and Ahar at southeastern side of the province has provided an appropriate opportunity to create regional balance throughout the province. Thus, what the provincial authorities should be employed in regional plans and policies is to improve these towns and feeding of capital for them in order to reduce immigration to Tabriz city and this may double the role of these cities in regional development.

Table 9: The comparison of share-sector variances of Maragheh city with medium-sized cities in eastern Azerbaijan province within provincial economic structure during years (1986-2011)

Main activity groups	The rariations of employment in economic section of the district	Variance of employment in economy of Maragheh	Economic position of each sector in provincial economy				
			Maraghe h	Marand	Mianeh	Ahar	Bonab
Agriculture	-0.241	0.0354	-0.0728	0.184	0.211	0.185	0.0143
Industry	-0.0241	-0.0674	0.030	-0.026	-0.060	0.247	0.0471
Services	-0.0241	0.0369	-0.036	0.0422	0.0015	0.925	0.0420

Source: Research findings

XXI. CONCLUSION AND SUGGESTION

As it mentioned, the present investigation is aimed at study on performance of Maragheh medium-sized city in urban system and regional development in eastern Azerbaijan province. According to the conducted calculations and with review on these tables, demographic position and condition was characterized where among other provincial medium-sized cities and after Marand and Bonab cities, Maragheh town has the highest rate of elasticity modulus and attraction of population due to its appropriate geographical and communicative situation. The given results from entropy index show that if demographic performances of Maragheh city and medium-sized cities have been ignored, eastern Azerbaijan province recedes from demographic balance and equilibrium in urban centers in all four phases of years 1986, 1996, 2006, and 2011 so the resultant findings from logarithmic distribution model of urban rank-size verify this issue so that slope of urban rank-size with and without considering Maragheh city increases -1.47 and -1.42 respectively in 2011. In terms of economic performance, Maragheh city and other medium-sized cities in this province have played dominant role in agriculture and servicing sectors. Analysis on economic structure trend in provincial medium-sized cities suggests that during aforesaid decades, agricultural sector has ascending trend both throughout the province and in medium-sized cities. The industry sector has had descending trend in the province as well as in Marand and Mianeh while it had ascending trend in other towns including Maragheh city. Servicing sector had ascending trend both at provincial level and in medium-sized cities. Maragheh town and medium-sized cities had positive effects on provincial urban system in terms of demographic aspect and performance and what has downplayed performance of these cities to some extent was centralization of facilities, services, and factories in single dominant city of this province (i.e. Tabriz city). The adverse growth of Tabriz city, which is the result of performance and policy making of statesmen during previous years, has caused discontinuity and disparity of spatial organization and performance link among centers of provincial towns so that the long distance among Tabriz city and medium-sized cities has caused that no city could form with demographic classes of 250-500 thousand and 500 thousand to 1 million people population. The present lack of this residential hierarchy is one of the foremost factors in creating imbalance and lack of equilibrium in urban system of this province. Overcoming to this inequality and problem and achieving regional balanced development may not resolved except for taking a systematic and spatial approach toward design and codification of development plan. Planning should based on this attitude in such a way that to spread development throughout geographical space of this province and to remove spatial heterogeneity and lack of balance in urban hierarchy. To adjust this spatial structure, rather than decentralization of Tabriz city, the best option is injection of facilities and capital toward medium-sized cities and leading them to big- medium-sized cities since placing of medium-sized cities in appropriate geographical situation has provided this opportunity so with improving each of medium-sized cities, the lack of residential hierarchy may be fulfilled in provincial urban system.

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The study of citizen participation role on the reinforcement of the improvement-renovation plan with special reference to the empowerment approach (case study: shahid Garebaghi neighborhood-Tabriz-Iran)

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***Abstract*—** the main objective of this study was to evaluate the citizen participation role on the reinforcement of the improvement-renovation plan with special reference to the empowerment approach in Tabriz. Based on the purpose of the research and its application, the study is a descriptive-analytic one. The required data for the study has been gathered and analyzed through field study and questionnaire. The population of the study was region 4 of Tabriz. 330 sample with using Cochran formula has been selected. Pearson correlation has been used to test the hypotheses. The results of the study indicate a significant relationship between improvement-renovation projects performance and citizen participation, in contrast there is no significant relationship between improvement-renovation projects performance and empowerment approach. Finally recommendations are proposed.

***Keywords*—**citizen participation, empowerment, improvement-renovation, Tabriz

I. Introduction

One of the major elements of democratic government, is public participation in the municipal decision making process. Increasing public participation in municipal affairs, can play a valuable role in the balancing between different sectors of society. Participation in the public and civil affairs has a long history. Participation literature has been developed by Jean-Jacques Rousseau. In the 19th century that liberalism and in the 20th century that radicalism was dominant, participation has been considered. The reason for this can be noted as participation role in the increasing awareness of the people in the social, political, moral … affairs. [1]. Maybe the reason that participation has been considered and emphasized as a major factors of development, was the failure of development strategies and programs in the 1950 and 1960. [2]. So that because of sensitivity of the issue, UNESCO (international organization) has announced that development should begin from the people (what they do, think and believe). [3]. Based on this, we can say that concept of participation in terms of applied view covers this issue that, people and society will benefit from its advantages with direct and indirect influence on the municipal affairs and another related subjects. Citizens with participation in the municipal affairs will connect to a network of relationships that can play a role as supportive role for them in the future. Especially, in a society that, there is vulnerable groups, participating them in the municipal affaires, Cause increase in the self-esteem, social interaction and enhance the experience and skills of the participators. [4]. Role and importance of people participation in the world summit of Alma-Ata in the 1978 has been announced. The conference emphasized the importance of full and organized community participation. [5]. participation is the main key of development and management of urban plans and its realization in practice, requires consensus in decision making and administrative reinforcement. Because of effective participation, People should be involved at all stages of plan like planning, design, implementation and evaluation of programs. For this reason, participation concept was mentioned as one of the city's stated requirements that will affect the planning and management. Therefore, solving urban problems would be possible with appropriate using of citizens potentials and capabilities within the context of participatory programs. Here it is necessary to define citizenship

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participation to understand the term of *participation*. Participation is the action of taking part in something. Participation is a sort of manner with people that enables them to make decisive influence over events that affect their lives. [6]. Participation has four level that the lowest level is supply of labor and the highest level is decision making but kind of participation is different in the urban plans. This plans are: the master plan, detailed plan, improvement-renovation plans and Participation has important role on the reinforcement of the improvement-renovation plan in informal settlements of cities. In fact, informal settlements of cities are neighborhoods with historical and valuable identification that in total are more than half of the current areas of cities. Experts believe that informal settlements has three main factors which are: 1- blocks that more than 50 percent of them are less than 200 m^2. 2- Blocks that more than 50 percent of their buildings are unstable. 3- Blocks that more than 50 percent of their streets width are less than 6 meters. In accordance with article 30 of the law of the fourth socio-economic and cultural development plan, the government should use improvement-renovation plan to prevent the unsuitable growth of urban areas. [7].

In Iran, city of Tabriz has more than 2500 ha informal settlements and requires improvement-renovation plan to reform the city's landscape and prevent from disasters. [8]. most important distressed neighborhoods of Tabriz are: Golestan, MiarMiar, Baghmisheh, Khagani, Ghajil, shahid Beheshti crossroads. One of the informal settlements of Tabriz is shahid Garebaghi neighborhood that due to the lack of attentions to the construction engineering in the past, most of buildings are unstable.

II. RESEARCH OBJECTIVES

1- The study of citizenship participation role on the reinforcement of the improvement-renovation plan.
2- The study of empowerment approach role on the reinforcement of the improvement-renovation plan.

III. HYPOTHESES

1- There is a significant relationship between reinforcement of the improvement-renovation plan and citizenship participation in the Shahid Garebaghi neighborhood.
2- There is a significant relationship between empowerment approach and reinforcement of the improvement-renovation plan in the shahid Garebaghi neighborhood

IV. RESEARCH METHOD

This study was conducted in the shahid Garebaghi neighborhood, the fourth region of Tabriz city in Iran. Required data for the study has been gathered and analyzed through field study and questionnaire. The population of the study was fourth region of Tabriz. With using Cochran formula 330 people selected as a sample. To reduce selection bias, random sampling was done. A total of 330 questionnaires were distributed to the people of shahid Garebaghi neighborhood. SPSS 19 software used to analyze the data. Pearson correlation has been used to test the hypotheses.

V. CONCEPTS OF PARTICIPATION

Participation, in the development context, is a process through which all members of a community or organization are involved in and have influence on decisions related to development activities that will affect them. That implies that development projects will address those community or group needs on which members have chosen to focus, and that all phases of the development process will be characterized by active involvement of community or organization members. [9]. Participation is a rich concept that varies with its application and definition. The way participation is defined also depends on the context in which it occurs. For some, it is a matter of principle; for others, practice; for still others, an end in itself. Often the term participation is modified with adjectives, resulting in terms such as *community participation, citizen participation, people's participation, public participation,* and *popular participation*. [10]. The Oxford English Dictionary defines participation as "to have a share in" or "to take part in," thereby emphasizing the rights of individuals and the choices that they make in order to participate. Paul's five objectives to which community participation might contribute are:

1. Sharing project costs: participants are asked to contribute money or labor (and occasionally goods) during the project's implementation or operational stages.
2. Increasing project efficiency: beneficiary consultation during project planning or beneficiary involvement in the management of project implementation or operation.
3. Increasing project effectiveness: greater beneficiary involvement to help ensure that the project achieves its objectives and that benefits go to the intended groups.
4. Building beneficiary capacity: either through ensuring that participants are actively involved in project planning and implementation or through formal or informal training and consciousness- raising activities.
5. Increasing empowerment: defined as seeking to increase the control of the underprivileged sectors of society over the resources and decisions affecting their lives and their participation in the benefits produced by the society in which they live. [11]. Fig (I) indicate the process of participation in the urban plans.

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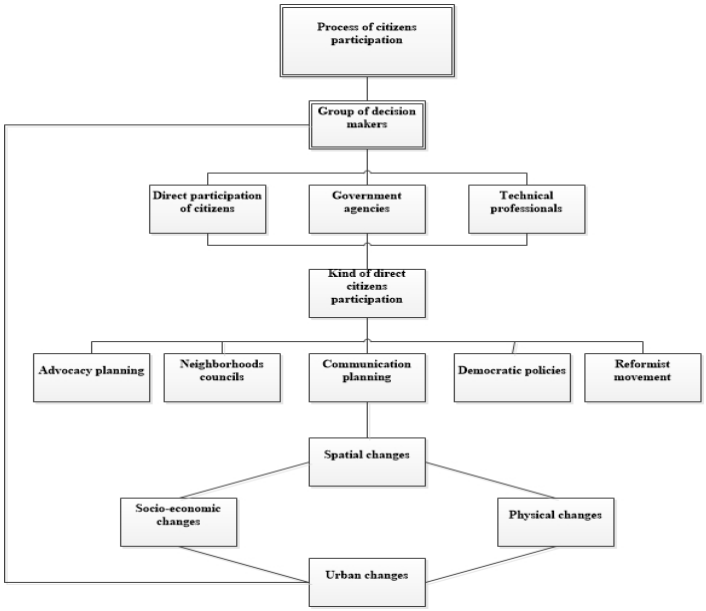

Figure I: process of participation in the urban plans [11].

VI. CONCEPT OF EMPOWERMENT

Ideally, empowerment, in the development context, is that state of belief in one's ability or capacity for determining and carrying out self-development. It comes from the experience of tangible success through a project's history, from conception to actualization. It is the successful experience and reward from a job well done and the positive consequences of that feat. An important aspect of empowerment is that it can serve that group in the future, individually and collectively. [11].

Empowerment is built through enhancing capacity, participation, and ownership. When persons in a group or community become more educated and better trained, they become more effective in their pursuits, consequently, the group is seen as a "force to be reckoned with," and can have an impact on the community as a whole giving them a sense of identity and control over their future. [12]. Empowerment approach is the latest theory that expressed in the field of informal settlements. This approach accepts informal settlements as a fact. The main purpose of empowerment approach is addressing ways to improvement all aspects of residents' life. [13].

VII. HYPOTHESES TESTING

To analysis of respondents' opinions, Likert scale used and classified as follow: absolutely disagree with value of (1) and absolutely agree with value of (5). If the mean of any questions was more than (3), it represents good condition. In contrast if the mean of any questions was less than (3), it represents bad condition. For hypotheses testing Pearson correlation has been used.

The results of descriptive statistics in table (1) indicate that the mean value obtained from analysis of data for improvement-renovation variable is (2.59) and it is less than expected value of 3. The mean value obtained for citizenship participation is (3.65) and for the empowerment variable is (4.04). It is clear that the last both variables have good conditions in the shahid Garebaghi neighborhood.

Table I: Results of descriptive statistics

	N	Minimum	Maximum	Mean
Improvement-renovation	330	1	4.50	2.59
Citizenship participation	330	1	4.83	3.65
empowerment	330	1	4.89	4.04

A. *Results of first hypotheses*

H_0: $r_{xy}=0$ There is no significant relationship between reinforcement of the improvement-renovation plan and citizenship participation in the Shahid Garebaghi neighborhood.

H_1: $r_{xy}\neq 0$ there is a significant relationship between reinforcement of the improvement-renovation plan and citizenship participation in the Shahid Garebaghi neighborhood.

According to table (II) it is observed that the Sig= 0.02<0.05. H_0 was rejecting with 99% of certainty and H_1 confirmed and the relationship is significant. The correlation between two variables of improvement-renovation and citizenship participation is +12.3 percent which indicates direct relationship between two variables. Coefficient of determination between improvement-renovation and citizenship participation is 0.1512, which indicates that the independent variable could explain the dependent variable to the amount of 15.12 percent.

Table II: Results of the Pearson correlation coefficient for the improvement-renovation

		Improvement -Renovation	Citizenship Participation
Improvement-Renovation	Pearson Correlation	1	0.123*
	Sig. (2-tailed)		0.026
	N	330	330
Citizenship Participation	Pearson Correlation	0.123*	1
	Sig. (2-tailed)	0.026	
	N	330	330
*. Correlation is significant at the 0.05 level (2-tailed).			

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B. Results of second hypotheses

H_0: $r_{xy}=0$ There is no significant relationship between empowerment approach and reinforcement of the improvement-renovation plan in the shahid Garebaghi neighborhood

H_1: $r_{xy}\neq0$ there is a significant relationship between empowerment approach and reinforcement of the improvement-renovation plan in the shahid Garebaghi neighborhood

According to table (III) it is observed that the Sig= 0.39>0.05. H_1 was rejecting with 99% of certainty and H_0 confirmed and the relationship is not significant.

Table III: Results of the Pearson correlation coefficient for the empowerment approach

Correlations			
		Empowerment Approach	Improvement-Renovation
Empowerment Approach	Pearson Correlation	1	0.47*
	Sig. (2-tailed)		0.399
	N	330	330
Improvement-Renovation	Pearson Correlation	0.47*	1
	Sig. (2-tailed)	0.399	
	N	330	330
*. Correlation is significant at the 0.05 level (2-tailed).			

VIII. CONCLUSION

In this study, the citizenship participation role on the reinforcement of the improvement-renovation plan in Tabriz-Shahid Garebaghi neighborhood were evaluated. The results of this research increased our knowledge about the citizenship participation role on the reinforcement of the improvement-renovation plan. According to the analysis performed there is positive and significant relationship between reinforcement of improvement-renovation plan and citizenship participation. In contrast, there is no significant relationship between reinforcement of improvement-renovation plan and empowerment approach in the shahid Garebaghi neighborhood. Municipality of Tabriz city with using of this research findings can improve the reinforcement of the improvement-renovation plan.

IX. SUGGESTIONS

- Providing guidelines for neighborhood meetings to increase citizenship participation
- Considering citizens opinions to increase citizenship participation
- Considering empowerment approach especially in the field of social empowerment
- Authorities should try to consider a way to attract the private investors in the field of improvement-renovation plan.
- Recruitment of local workers in the reinforcement of improvement-renovation plan to create job positions in the community
- Providing guidelines to coordination with citizens before reinforcement of plan to describe the process of improvement-renovation plan.

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