A Consideration and Evaluation of Physical Developmental System in Urmia Using GIS

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ABSTRACT

Urban Sustainability, Urban Form (compactness and dispersion), and suburbia are of the most vital and challenging issues of urbanism and urban planning in twentieth century. In fact, this can be known as a shift from mechanical city, which has led to environmental unsustainability, toward urban sustainability. Nowadays, disproportionate growth of population, horizontal expansion, and urban sprawl have become important concerns. This issue has boosted the necessity of setting urban guidelines and controlling of city development because it has had negative and challenging effects on the city and surrounding agricultural lands, in one hand, and is one of the most important features of sustainable cities, city development, and its skeletal growth. Thus, the present study seeks to investigate and describe physical developmental growth in city of Urmia from past to the present. In this way, using strategy of sustainable development in this research, attempts have been made to evaluate Urmia’s skeletal development. Besides, it aims to consider how the city has improved during the last decades so as to find out whether already existing development is after reaching sustainability or not, and if system of this development is homogeneous or not. To this aim, firstly, city developmental trend during historical eras was set as the basis of the discussion. Then, the way of development and dispersion of different land uses was investigated. Findings of the study show that Urmia has gone through a very quick process of skeletal growth and has experienced heterogeneity during development of different textures. Also, way of development and dispersion of land uses has followed a relatively inappropriate system.

INTRODUCTION

According to statistics predicting Iranian population in 2021, i.e. 130 million people, and current urbanization growth rate, a city area twice more than the current area would be required. Although internal growth of the city can remove some of the requirements, most development would take place in suburbs. Nowadays, rural natural areas in suburbs are utilized as raw materials for urban development [17] where unthoughtful development of land uses lead to corrosion of desirable lands and vital ecosystem, and finally put both natural and artificial environments into serious crisis. For betterment of controlling such developments, we need city developmental planning in order to describe appropriate aspects of development, right land locations, and execution of natural preservation policies. As political capital of West Azerbaijan province, it has had a slow reasonable pace of growth since 1961. However, with the beginning of new changes, particularly after land reformations and rural immigrations, economic growth in first 1970s which preceded increase of income and urban attractions, Urmia tended to make use of its agricultural lands, river banks, and hills in order to find ways to satisfy its growing population. Using analytic instrument GIS, Urmia physical development has been taken into consideration so as to make sure whether its current developmental trend is desirable or not.
2. Statement of the problem:

Urban physical development is a dynamic consistent process, through which urban physical boundaries and city skeletal areas increase either horizontally or vertically, qualitatively or quantitatively. In case this trend is fast and without a plan, this would not lead to proportionate physical discipline, instead, would make urban environment into many problems. Development and expansion of buildings in different urban, rural, and industrial zones locating in the nature requires constant consideration of their natural features. Physical study is among the most fundamental responsibilities of urban planner. It needs to be investigated in advance of any other study, since it serves as the basis of all studies. In study of urban physics, we need to take account of both human and natural factors, beside their mutual interactions and its effect on urban development. On the contrary, lack of reasonable recognition and awareness of such limitations cause to development of the city toward such obstacles which finally put the city and urban areas into serious problems. Irregular development of the cities is a global issue and some have predicted that more than 65% of world population will be living in the cities in 2025.

Nevertheless, fast growth of urban dispersion has had detrimental influences on the environment. Although scientific findings have shown that urban comprehensive developmental pattern which expands to suburbs is not important in development of the city, this is the paramount pattern of urban development.

One repercussion of such development is facing natural and human limitation around the city. Like many other cities, Urmia has faced many problems in its physical development. Up to 1961, Urmia followed a logical growing trend. However, with influences land reformations had on rural and urban societies and, subsequently, immigration from villages, economic growth in 1970s, increase of urban incomes and changes after Iranian revolution caused the city to go through an irregular growth. As a result, Urmia has now confronted with many human and natural obstacles in its way to development. Ignoring such obstacles in future development would lead to many other problems. The present study aims to identify Urmia developmental trend and investigate its effect on physical development of the city. Findings would make limitations of physical development known to Urmia city planners and managers and then offer logical executive strategies in solving them. Therefore, employing Geographic Information Systems (GIS) is an important factor for homogeneous urban development, a prerequisite to the reasonable relationship between the container (buildings and urban equipment) and containing (population). Also, GIS is required since it creates balance between urban development and its bed (natural area) considering limitation and obstacles and regularization of physical development and expansion.

3. Literature review:

Introduction of sciences related to urbanism and urban planning caused expansion of many thoughts and theories relating to city and urban development. In 1955, in consideration of Chicago and area development, Ernest Bergs invented model of concentric circles. Since Bergs was after finding the effect of climate on population growth, he assumed urban development as circular. In this sense, his distinguishing idea is that, in physical development of the city, land use dispersion has occurred as a result of which peoples and individuals have been replaced [17]. Regarding urban physical and spatial development, Hammer believes that economic and social differences in population and skeleton structures can lead to establishment of Sector Model. Then, Harris and Olman present multiple-core model of the city which is a model with a completely geographical model based on difference in land morphology and typography [10]. William Herd emphasizes the importance of importing and exporting roads to the city and deems a city’s major development in extension of these roads, which itself raise the value of surrounded lands. Harroldmir, American geographer, proposes that ‘automobile’ plays a crucial role in creation of multiple-core cities, increase of suburbia, and development of the city. Peterman, an American sociologist, proposed a new theory for cities in England and introduces ‘blow of wind from the west and from the ocean’ as a reason for the separation of ecologies. This factor leads to the fact that western regions are now the best residential places while urban regions are serving as an industrial sector. Robert Dickenson presumes city structure to be very comprehensive and draws different regions including central region (old and ancient textures of the city with the most contraction of space and a center of communicative network), middle region (building compaction and disciplined streets, focusing on residential uses), external region (residential areas with urban equipment, open areas with low compaction of population and buildings), suburb (outside city boundaries, open natural areas).

Luis Memford presumes city development as comprising of 6 main stages:
- Eopolis, a unit for which agriculture is the main basis of economy.
- Polis, in this stage, city is a small unit with economic and trading activities.
- Metropolis, city reaches its ultimate growth in this stage.
- Megapolis, a city which has a complicated and chaotic form due to extra development.
- Tinopolis, in these cities, there is more decadence in commercial, business, and military aspects.
- Negropolis, in this final stage, the city is in its worst position, also called a ‘dead city’.

Batty and Denshan introduced GIS as a supportive instrument of urban planning and proposed that digital environments are very important in decision making about cities’ urban physical planning. In a study with the
title of “third world cities requiring information” pointed out the importance of GIS, digital maps and satellite photographs used in the process of land use and value in Tehran, Iran. Casey and Peterson designed adjacent planning using GIS and focused its significant role and application in strategies used in Philadelphia physical development. In addition, researchers such as Schmidt, Chorley, Peter Hought, Hudson, Murphy, Paul Chlavel and Hawlie, etc. introduced different theories of urban planning including general design of cities, linear and corridor designs, natural design of city, urban painful development, chaotic design of city and urban GIS, etc. In Iran, Farid [10] introduced ‘city bonding theory’ in which bonding of lands around the very firstly-established parts and bonding of cities with villages as important elements of physical development. Also, he adds that immigration from small-sized to middle-sized villages and from towns to big cities are reasons of changes in economic and social structures (159). Azimi [4], in his PhD thesis in University of Ottawa, employed technical instruments and GIS-based methods to investigate physical development trend of city of Tabriz, Iran and factors influencing that (1). Other studies in this field include Hanafi who chose Maraghrh, Iran, Jooybari who took account of urbanism, Zangi-Abadi [31] who considered city of Razi, and Shamaee who investigated Yazd, etc.

4. Research assumptions:

For the purpose of application analysis of land use and developmental trend of Urmia and also its application evaluation and answering main research questions, three fundamental assumptions were formed according to researchers’ ideas:

First assumption: it seems that skeletal development of Urmia has led to formation of its heterogeneous structure.

Second assumption: it seems that in developmental process of Urmia, city land uses have not developed in line with its residential areas development.

Third assumption: it seems that current physical development trend in Urmia is not reasonable.

5. Methodology:

According to our purpose, scientific researches fall into two categories of basic and practical. Methodology include practical considerations, since they are after evaluation of skeletal development in Urmia and findings can be applicable to urban planning. The present study adopts a descriptive-analytical procedure: data have been collected using documentary method of research besides making use of reports, annuals and other resources. Further, use has been made of surveys (interviews and observations). Data (area and city population in different eras) have been collected using public census and comprehensive and detailed procedures. Finally, population of the study include Urmia.

6. A description of the target city:

Urmia is the capital city of West Azerbaijan province, located at northern west of Iran. This city is located at the middle of the province, 18 kilometers far from Lake Urmia. The city is located in a plain with 70 kilometers length and 30 kilometers width. North latitude of Urmia is 37 degrees and 4 minutes and its east longitude is 37 degrees and 32 minutes. According to the latest census in 1390, population of the city is 667499. City population has been 61.24, 67.37 and 70.58 percentage of the total population of the province in 1996, 2006 and 2011, respectively. Increase of urban population in these decades has been due to greater attraction of people in Urmia: attracting villagers. Such increase in this 25-year period [8] denoted great immigration of villagers to this city. Moreover, Urmia Plain is one of the most fertile plains in the country. In the west, there is Turkey and this has add to the economic and political status of the city. Finally, Urmia is a commercial city and center of trade in West Azerbaijan province.

Table 1: Population trend and growth rate of Urmia in past eras.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>677499</td>
<td>3.8</td>
</tr>
<tr>
<td>2006</td>
<td>63932</td>
<td>4.7</td>
</tr>
<tr>
<td>1996</td>
<td>583255</td>
<td>4.41</td>
</tr>
<tr>
<td>1986</td>
<td>538255</td>
<td>3.8</td>
</tr>
<tr>
<td>1976</td>
<td>34899</td>
<td>6.2</td>
</tr>
<tr>
<td>1966</td>
<td>22496</td>
<td>4.03</td>
</tr>
<tr>
<td>1956</td>
<td>14358</td>
<td>5.1</td>
</tr>
</tbody>
</table>

Source: census 1956 – 2011 – statistics

7. Findings:

Urmia is an old city in Iran. This city has experienced different status in different eras. Urban development has had a slow pace up to contemporary era. Recently, after Reza Shah Empire, when all cities turned to reshape their skeletal area into Christ-like streets, Urmia started its fast growth like other old cities of the country. After 195, with the implementation of civil programs, urban equipment was completed and network of electricity and water pipes was promoted. In 1970s decade, urban shape of development in Urmia has a strong relationship with its economic characteristics. Like many other cities of the country, ecologic texture of Urmia has gained a
different pattern in these years and residence of different social classes follow particular patterns on the basis of social changes. Statistics obtained from an investigation of skeletal development trend between 1966 and 2011 indicate that development of the city has not been in total agreement with its population growth: skeletal development is faster than population growth which has led to a false skeletal development for Urmia. Even now, one can see lack of realization of predicted developmental designs in Urmia which have led to abnormal increase of its skeletal development. During this skeletal development in Urmia, different textures have been created including old texture, middle area texture, and suburb texture, each having particular characteristics. Old texture include initial core of the city, which elements such as bazars, Jame’ mosque, bathrooms, and sets of residential areas. Middle area texture comprises of buildings built to the first 1960s. Suburb texture, including two areas of ‘recently-developed areas’ and ‘developed suburbs’; they either serve as a place for the residence of those who have left downtown or those villages which have attached to the city as a result its development. As it can be observed in table 2, developmental trend in Urmia is so fast and unpredictable. In addition, what needs to be more noted is expansion of city boundaries, residence uses, and sidewalks, particularly after 1995.

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
Type of use & Use status 2010 & & Use status 1989 & & Use status 1989 & \\
& percentage & (hectare) & & percentage & (hectare) & & percentage & (hectare) \\
\hline
housing & 129.07 & 42.05 & 38.22 & 141.976 & 38.22 & 56.66 & 129.07 & 55.6 \\
service & 318.6 & 10.47 & 13.7 & 390.92 & 10.54 & 13.7 & 318.6 & 10.47 \\
Sidewalk network & 713.08 & 23.24 & 30.7 & 692.8 & 18.69 & 30.7 & 713.08 & 23.24 \\
\hline
\end{tabular}
\caption{Uses of current lands- designs passed by Urmia from 1989 to 2010.}
\end{table}

Despite all, it can be stated that Urmia has experienced fast growth of population due to many reasons, including reasonable natural preconditions (fertile agricultural lands and abundant water resources), road development and building houses around them, immigration (which has itself led to attachment of suburb to city, cooperative town building and creation of unreasonable residential areas and suburbia) and the notion of ownership. Since physical development pattern in every city is crucially influenced by sustainability or unsustainability of that city, urban planners and managers be completely aware of physical and spatial pattern of development so as to guide city toward a pattern of sustainable urban development.

This type of unsustainable urban growth pattern has created many negative repercussions in economic, social and environmental sectors; examples of such repercussions can be corrosion of agricultural lands around
the city, decadence and pollution of water and soil resources, air pollution, high expenses of urban services, increase of length and period of travels and subsequently increase consumption of fossilized oil, social separation, lack of attention to land use or extra use of that, etc. As regards the necessity of guiding urban development to more sustainability, changing it and using strategies in order to compact cities more and more is required a lot.

Table 3: A comparison of current land use through detailed design 1995 and review of comprehensive design 2010.

<table>
<thead>
<tr>
<th>Type of land use</th>
<th>Status quo 2010</th>
<th>Suggestion of detailed design 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>capitation</td>
<td>percentage</td>
</tr>
<tr>
<td>Residence</td>
<td>43.7</td>
<td>29.7</td>
</tr>
<tr>
<td>Business and service</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Education</td>
<td>2/0</td>
<td>1/4</td>
</tr>
<tr>
<td>Cultural</td>
<td>0/1</td>
<td>0/1</td>
</tr>
<tr>
<td>Religious</td>
<td>0/3</td>
<td>0/2</td>
</tr>
<tr>
<td>Sport</td>
<td>0/8</td>
<td>0/5</td>
</tr>
<tr>
<td>Parks and green area</td>
<td>3/5</td>
<td>2/4</td>
</tr>
<tr>
<td>Medical and sanitary</td>
<td>6/00</td>
<td>0/4</td>
</tr>
<tr>
<td>Tourism</td>
<td>0/1</td>
<td>0/1</td>
</tr>
<tr>
<td>Equipment</td>
<td>0/9</td>
<td>0/6</td>
</tr>
<tr>
<td>Transportation and storing</td>
<td>1/5</td>
<td>1/0</td>
</tr>
<tr>
<td>Industrial and productive centers</td>
<td>0/9</td>
<td>0/6</td>
</tr>
<tr>
<td>Cemetery</td>
<td>0/8</td>
<td>0/6</td>
</tr>
<tr>
<td>Official and disciplinary</td>
<td>3/0</td>
<td>2/0</td>
</tr>
<tr>
<td>Other applications</td>
<td>3/66</td>
<td>26/3</td>
</tr>
<tr>
<td>Gardens and livestock fields</td>
<td>6/5</td>
<td>4/4</td>
</tr>
<tr>
<td>Sidewalks</td>
<td>35/1</td>
<td>23/9</td>
</tr>
<tr>
<td>Other applications</td>
<td>4/3</td>
<td>2/9</td>
</tr>
<tr>
<td>Garrisons</td>
<td>1/2</td>
<td>0/8</td>
</tr>
<tr>
<td>Total</td>
<td>147/1</td>
<td>100/0</td>
</tr>
</tbody>
</table>

Source: review of detailed design 2010

1. Test of the first assumption:
   From the beginning to 1960s, Skeletal growth Urmia had gone through a slow and homogeneous trend, while in recent years one can see fast growth and expanded skeletal development of the city. In this way, Urmia area has increased from 5214 hectares in 1995 to about 8577 nowadays, which has followed a faster growth than its population. A natural result of such growth has been reduction of population density and increase of gross urban production, so that gross density of the city has reduced from 83.45 people in 1995 to 77.5 nowadays. As a conclusion, we can see that more than 70 percent of city area has a gross density less than 100 people per hectare. Such a low-density development has been results of creation of suburbs and attachment of surrounded villages to the city, creating three different textures each having its own characteristics. In this way, it can be stated that the first assumption regarding creation of heterogeneous textures in Urmia taken place as a result of uncontrolled skeletal growth is approved.

2. Test of the second assumption:
   ‘Residential use’ of lands in Urmia is the only land use whose amount was not proportionate to the whole city area; it increased significantly. In 1995, 14169724 square meters (27.17% of the total area) of Urmia was used for ‘residential uses’ while this amount has raised to 25504552 square meters (30% of the total area) now; it has approximately doubled. Other uses have not shown such growth and they have significant differences with typical capitations in urbanism; in some cases, they have been decreased as compared to their amount in 1995. For example, medical-sanitary use was 0.98 in 1995 for per individual which raised to 0.06 square meter in 2010, i.e. significant decrease. Also, in 1995, ‘educational use was about 2.46 square meters which reduced to 2 square meters per individual in 2010. Moreover, even those uses with capitations slight growth, compared to their amounts in 1995, they have nevertheless significant differences with standard capitations. For instance, for ‘green area use’ has 2052685 square meters, with a capitation about 3.5 square meters for every individual, while the standard capitation is 8 square meters, as expressed by urbanization and architecture higher council, thus a great difference. Also, ‘religious use’ was about 0.2 square meters in 1995 and it was 0.3 in 2010 (in increase equal to 49724 square meters) and, again, in total difference with its standard capitation which must be between 0.5 and 0.75 square meters for each individual. Therefore, as it was observed, among all land uses in Urmia, only ‘residential use’ has shown a development far different from other uses and this indicates shortcomings in offering services and developmental standards in Urmia. In this way, it can be proposed that the second assumption regarding lack of homogeneity between development of ‘land use’ with that of other uses and having difference with standards of urbanism is approved.
- **Test of the third assumption:**

What is evident is that Urmia is a single-cored city, comprising of one centralized focus (bazar) and other activities around it. In recent decade, fast growth of the city, lack of realization of immense parts of suggestions on the part of developmental designs, incapability of urban management in supervising and controlling of skeletal-functional changes, etc. are reasons for lack of discipline and homogeneity in city land uses and their relative location in the city. Besides central part of the city and ‘Shahrchay’, there are also centers, focal parts and other functional places have been located in middle of residential areas. However, these parts are sometimes lacking homogeneity and that is why particular locations cannot be set for different land uses. Other than Shahrchay, as the most salient realization of city skeletal organization, management of the division of the city and also local divisions remained from the past are the most important elements of city skeletal formation. Western and eastern direction of the city divide Shahrchay into two northern and southern sections. Northern part is the pioneering and main section while southern part is the newly-established recent of the city. In this sense, majority of main elements of the city (except some new land uses) are located in its northern parts. Since this part is next to other roads in the city (roads connected to Salmas, Mahabad, Seru, Golmankhaneh, Tabriz and Anhar), all these have created a central-radial mixture, being connected together at indefinite distances from circular (incomplete) networks. Among radial roads along with Beheshti (between Ghuyun bridge to Salmas Exit) there exist a way that divides northern part of the city into two separate parts (both functionally and historically). Thus, according to research findings on this pattern of city growth (dispersed and horizontal) with many negative repercussions it has created in different economic, social and environmental sectors, third assumption is annulled due to unfavorable physical growth of Urmia now.

8. **Conclusion:**

The present study made attempts to investigate skeletal development system of Urmia through an evaluation of different dimensions of its skeletal development including pattern and trend of skeletal development, way of different land uses development, and its skeletal development in connection to nature. Findings indicated that Urmia has experiences fast growth of population due to favorable natural bed (very desirable lands for agriculture and immense water resources), roads expansion and houses around them, immigration (which has led to attachment of surrounded lands to the city, creation of cooperative towns and suburbia) and the notion of ownership. That is, the city has followed a physical and spatial pattern. Regarding this unfair pattern of unsustainable urban growth, many negative repercussions have formed in different economic, social, and environmental sectors, including corrosion of agricultural lands around the city, decadence and pollution of water and soil resources, air pollution, high expenses of urban services, increase of length and period of travels and subsequently increase consumption of fossilized oil, social separation, lack of attention to land use or extra use of that, etc. In addition, following conclusions are main ones:

- Development of Urmia is mostly occurred horizontally which itself has led to issues such as increase of transportation expenses, providing services (water, electricity, gas, etc.), establishment of educational centers, limitation of urban areas, utilization of valuable lands around the city and creation of playing grounds in suburbs.
- Pattern of skeletal development was firstly single-cored but now it is changing to a multiple-cored pattern due to increase of city area and formation of new trade-business centers. However, generally speaking, developmental pattern is in form of radial pattern along the major streets.
- Available plane flat lands has made Urmia into a low-density city.
- Mixture of people with peculiar cultural backgrounds has also led to low density of population in Urmia, because half of the residents are villager immigrants. These people often demand big one-floor houses. This is also the most important factor in land expansion in suburbia.
- Because of immense expansion of the city based on a radial pattern and the fact that many towns are far from the city, such as Zibashahr, Shahed, Rudaki, Sepah, etc., from downtown, welfare has been affected and people in those towns need to take long distances every day in order to go to trade centers in downtown.
- In present conditions out of city boundaries, there are buildings with which is due to inability of executive management (due to reasons such as formulated limited by city legal boundary) which lead to corrosion of agricultural lands.
- Development in Urmia has led to attachment of villages to the city and creation of a village texture in the city, which can be seen in local areas such as Alvaj, Eslam Abad, Koshtargah, Digaleh, etc.
- Like many other cities in Iran, Urmia old texture has many problems such as lack of availability, buildings decadence, and lack of texture dynamics.
- Different lands uses in the city have not been development in accordance with development of skeletal pattern and residential uses. This problem precedes inability in offering qualitative and quantitative services to people.
- Around 70 percent of Urmia area has a population less than 100 people per hectare and this has made the city into a city with low population density.
- Main obstacles in skeletal development of Urmia are heights and agricultural lands around the city.
- City development in unfavorable environmental lands such as making houses in river banks, moving toward lands with high agricultural capacity, or building houses in areas in contradiction with principles of sustainable development have created problems now and will continue to create problem in the future.

Therefore, according to the necessity of guiding city development toward more sustainability, changing it, and using strategies to compact the city, following recommendations have been proposed.

9. Recommendations:
- Land division on the part of individuals is a crucial factor that leads to uncontrolled skeletal development of Urmia. Hence, the city has expanded sporadically, disorganized and without any plan. So as to have appropriate development, urbanism needs to precede urbanization. Urmia municipality and organization of roads and urbanism can act as an executive controller. In this way, creation of new towns outside the city and selection of appropriate places for apartments in the city would be controlled.
- It is necessary to restrain sporadic expansion of the city so as to save lands and expenses.
- Regarding fast growth of city and its buildings, municipality need to supervise rules and obligations in detail. Or it can dedicate a particular section to consider this issue.
- It is recommended to stop immense house building along roads. This issue would cause increase of the expense of providing services
- Another point to be taken into account in suburbs is precede of urbanization to urbanism. That is. Village immigrant do not have the necessary culture to live in the cities and, in this way, city si in the form of villages. Urban can be educated to these people through mass training.
- organizing suburb textures in Urmia and supervising house building in those areas is suggested; because with development of this texture villages would be attached and lead to immense skeletal growth and increase of abnormalities.
- It is necessary to make use of all facilities to prevent immense development of the city. So, priority is to build in the city so that building would be prevented in vulnerable ecological plains.
- As gross density in Urmia is lower than normal standards of urbanism, land uses have altered and led to immense skeletal development. Therefore, to reach greater density and saving lands, financial supports must be dedicated to those who aims at build their apartment vertically.
- During skeletal development of Urmia, residential land use has been far more than other uses which has led to more difficulty and expenses of providing services. However, other land uses need to develop in line with residential land use. Moreover, qualitative aspects of land uses need to be taken account of too. Some land uses are quantitatively, but not quantitatively, appropriate.
- Beside qualitative and quantitative dispersion of land uses, geographical distribution is important too. Interestingly, most business and service uses are located at the center of Urmia which have caused several problems for people.
- Replacement of and use change of lands such as army garrisons, storehouses, etc. with other purposes.
- Nature, a characteristics of many Iranian cities, has always had prerequisites of contingent disasters. Nevertheless, with regard to great amounts of economic investment in Urmia, plans need to be envisaged to preserve people and urban infrastructures.

But following patterns have been experienced in reaching at an optimal urban pattern (sustainability):
- First method was formulated under the influence of Modernism in Middle East. It values activities such as superiority, high density population, short travels to workplace, easy access to services and expanded use of public transportation in the city. Also, it takes steps for economic-social sustainability.
- Second method notices a decentralized focus on city buildings which has been so welcomed in the world. In this method, attempt is made to replace single-cored cities with multiple-core cities with an emphasis on compaction of cities and increase of activities in peripheral centers.
- Third method, perhaps the most important method of compaction in recent periods, is “transient development or fundamental transportation development”. In this model, renewal of transportation system is based on change of vehicles, discouragement of travel and limitation of automobile use. City growth is guided toward certain positions equipped with transit routes.
- Fourth method includes rebuilding of the city for contraction of sallow areas. In this way, aim of compaction procedure is rebirth of cores, historical places and unused lands.
- Fifth method is land division. Here, lands and houses belonging to individuals or the government serve as residential areas with high compaction. After rehabilitation, some part would be dedicated to communication and service network while the rest would become high compaction high quality residential areas for previous residents. Finally, expenses and interest of the investor would be fulfilled.

For Urmia, method of decentralized focus (transforming single-core city into multiple-core city on the basis of compaction and increase of activities in peripheral centers), emphasizing principles and strategies of urban smart growth has been suggested. This method has been recommended since it seems to be the best pattern for
development of skeletal-spatial in future. For this purpose, following recommendations have been proposed for Urmia:

- Use of compaction pattern in building new apartments, in order to stop horizontal expansion of the city
- Principled and smart urban management (for consistent competitive urban development)
- Centering local activities in local area and consequently promotion of life quality, more security, more active neighbourhoods, and support of jobs and services to create an environment for improvement of business and commercial activities.
- Creating a range of options and housing styles for different groups of people
- Encouraging people to constantly participate in developmental decisions.

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