European Online Journal of Natural and Social Sciences 2014; www.european-science.com
Vol.3, No.3 Special Issue on Environmental, Agricultural, and Energy Science
ISSN 1805-3602

An Investigation of Geographical Spread of Iranian Cities Based on Altitude

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Abstract
The spread of Iranian cities is manifested in different geographical directions including regional, bio-environmental features and many other factors. The purpose of the present study is to investigate and analyze the spread of Iranian cities based on the altitude from the sea level. The method of this research is analytical-descriptive. To analyze the data, the researchers have used the Zapf's most famous formula. Based on this formula, all the Iranian cities were divided into 11 categories in which the lowest category was 26 and the highest was 2790 from the sea level. Generally, the obtained results showed that that the spread of Iranian cities due to good weather condition and altitude from sea level was the most with the number of 227 or 19.30% and the least number of cities was at the altitude of 2536 with only 8 cities.
Keywords: Spread, Altitude from Sea Level, Iranian Cities, City Population

Introduction and Statement of the Problem

Based on their different influencing roles on rural and peripheral areas and the physical and geographical factors, cities do not have a uniform form and size and may be dense or scattered. To know about the function of such cities, one should study their roles and positions through hierarchical relations. So, the city hierarchical relations can be defined as classifying the cities based on their roles and importance in a geographical region. This classification must be based on quantitative data and qualitative factors (Rezvani, 1995, p.28). At the beginning of the 21 century, the human civilization moves toward urbanization very rapidly, and every day new cities are emerging in the world and most of these cities are emerging in the developing countries. This process of city development " in the developing countries has resulted in severe inequalities in different regions thus, forced the officials to struggle for better life conditions for migrants (Bergman et al, 2004, p. 192). In today's world, in line with the industrial revolution, we have seen an explosive movement in urbanization and the population of cities is increasing so rapidly that every day new cities are emerging in different regions of the world. The cities are expanding physically, swallow the peripheral regions and develop day and day. Such a phenomenon has begun in Iran in different dimensions and grown up very rapidly and caused severe challenges and problems due to the traditional nature and structure of Iranian cities. The spatial distribution system of Iranian cities and logical use of land show severe differences in geographical aspects. Thus, some of the city centers change into dominant and superior regions and become the leading figure in political, economic and social affairs of the country. The other regions of the country are absorbed by these cities and have a dependent role in this process. Although the reasons of these differences are clear, however the process of separation and even the social, cultural and economic gaps which threatens the uniform state of the country is of significant importance.

Literature Review

Discussion of urban systems and urban geography origins from emergence of different theories related to hierarchical order of residential areas and urban networks. Among these theories,

John Freedman's center- periphery theory, Walter's central place theory and Zipof's order-size law can be named. The purpose of these theories is to investigate the hierarchical systems of residential areas which are expanding toward a uniform development trend (Sarrafi, 2000, p.132). In his book titled " the dynamicity of Iranian urban system, Nazareyan (2012) refers to different dimensions of urban and urbanization and the factors of choosing the sites of urban in Iranian context. Regarding this, there are a vast number of studies through the world that we do not want to mention all here just a few numbers. By refining to the size of urban distribution and the process of Metropolisation of an urban system, Denise and et al. have mentioned two theories related to distribution of urban size: 1- the theory of central place 2- the simple stochastic model which is based on the order-size model. By applying this model, they have presented an inequal feature for each region of the world. They believe that inequality in urban distribution mostly refers to residential properties rather than economic development (Denise and et al, 2013, pp.307-314). Linisky and Arnold, in their study of the world's primary cities in 39 countries (Argentina, France, Mexico, Egypt, Iran, Japan, Pakistan, Brazil, Turkey, China, India, Canada, Vietnam, etc.) calculated ratio or first level city in the metropolitan area of over 1 million people. According to this study, the highest proportion was in Vietnam 3/16 and the lowest was in Canada. Indicators of urban primacy in Argentina, Iran, Turkey, Pakistan and India, were 1/9, 2/9, 3/3, 5 / 1 and 3/1 respectively (Linisky & Arnolds, 1969).

Geographical Position-the Limit and Extent of Iran

The land of Iran is a large area of Iranian flat which is located in western - south of Asian continent between geographical latitude of 25^0 to 40^0 of North and geographical longitude of 44^0 to 64^0 of East. Its land-measurement is about 1648000 km/square (Jedari Aewazi, 1995, p.8).

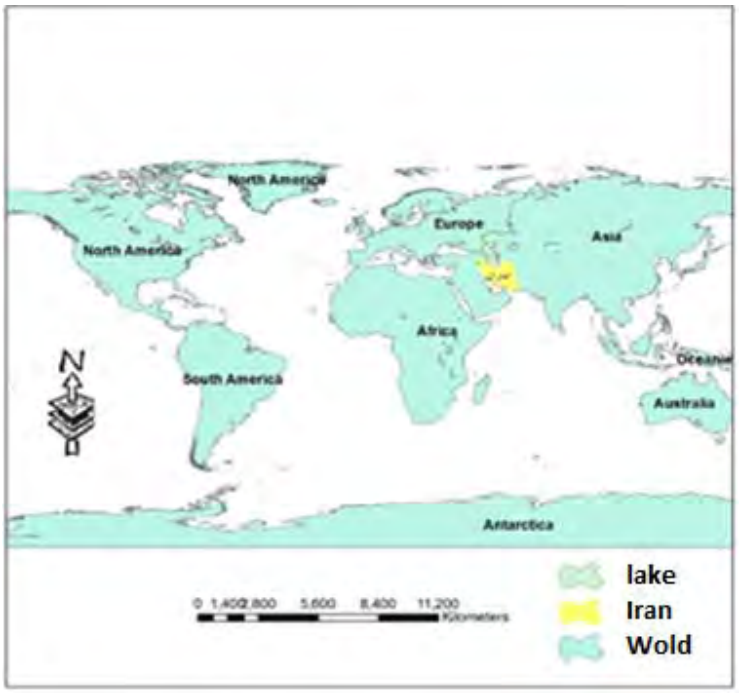

Figure 1. Geographical position of Iran in the today's world
Source: the Authors, 213

Materials and methods

First of all, the necessary information of this study was gathered from different related sources such as books, articles and theses. The method of the research is based on documentary-library. Then the obtained data were analyzed through GIS Software. For analyzing the obtained data the Zipof's size-order Formula was used:

R=max altitude –min altitude

R=2790-(-26) =2764

K=1+3.3(log1161) =11

HD=R/K=251

By using this Formula we can obtain the difference between the categories. We have 11 categories and the difference is 251. Based on this formula, we have the frequency table of Iranian cities according to altitude and the whole number of cities. After gathering the data and the altitude information of all the Iranian cities which were 1161 according to 2011 census, we used the geographical data system of GIS for analyzing the data.

Findings of the study

City distribution and population density is not the same in all regions of this country (Iran). For example, the northern, western and south-west have a very good weather as well as good geographical position and are among the first Iranian cities. These areas have been overpopulated every time and now have the largest proportion of the country population. The rate of precipitation is very high in these areas. There is a direct relationship between the rate of precipitation and geographical longitude. The rate of precipitation reduces from west to east. Based on the graph 1, the total number of Iranian cities in 2011 census was 1161. Generally, the spread of Iranian cities is between 26 to 2790 with the average of 1148.

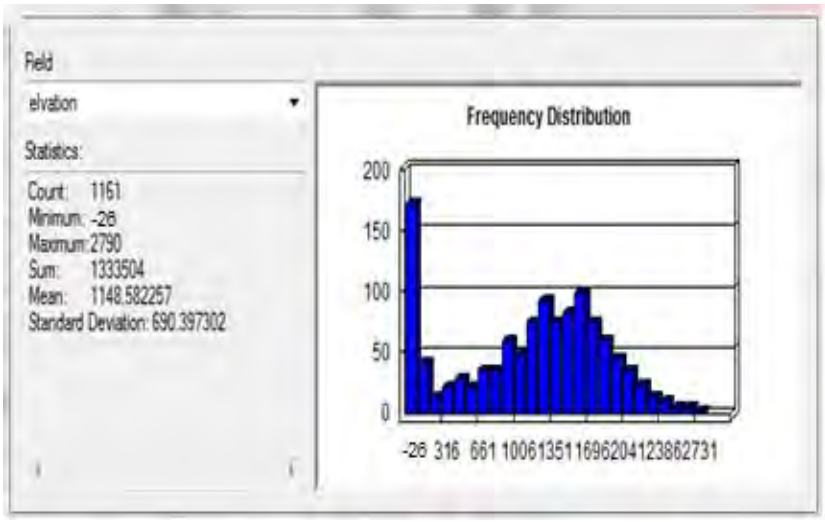

Figure 2. Altitude (Source: Authors, 2013)

As seen in the table 1, most of the Iranian cities are located in altitude less than 277 which is because the sea waters and good weather condition most of the Iranian cities are located in this area. The least cities are located in altitude more than 2536 with only 8 cities.

Table 1. The spread of Iranian Cities based on Altitude

Percent/Whole	Number of cities	Distance/Altitude(m)	Row
19.30	224	Less than 277	1
4.04	47	277 to 528	2
4.99	58	528 to779	3
9.04	105	779to1030	4
12.31	143	1030to1281	5
16.02	186	1281to1532	6
16.27	189	1532to1783	7
10.33	120	1783to2034	8
5.08	59	2034to2285	9
1.89	22	2285to2536	10
0.69	8	2536to2790	11
100	1161	-	Total

According to below graph, 19/3 percent of Iranian cities are located in altitude less than 277, which confirms this fact that most of these cities have good weather conditions. About 16.2 percent of these cities are located in altitude 1532 to 1783. The least number are seen above the altitude of 2536 in which the conditions of life is more difficult than the other regions due to weather and regional reasons.

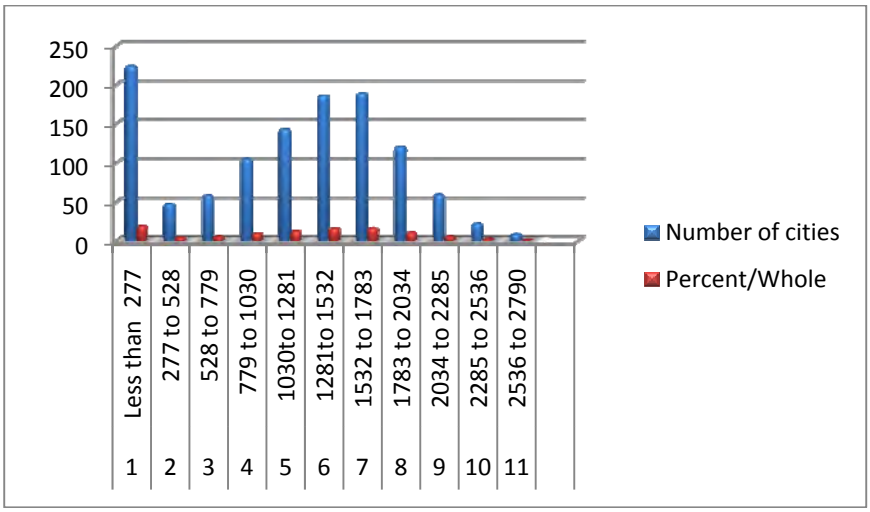

Figure 3: Spread of Iranian Cities Based on Altitude (Source: the Research Findings, 2013)

As seen in the following table, most of the cities are in the first classification with the population about 16.06%. In the fifth class, we observe the most population with 13390255 people. The least population is observed in tenth class which is about .39 of the whole population of the country and the least number of cities can be observed in eleventh class which is about 8 cities

Table 2: City Classification (percent)

Percent	Population	Percent	Number of Cities	Altitude Classification
16.06	8716419	19.30	224	First Class Cities Less than 277
0.89	482663	4.04	47	528 Second Class 277 to
1.85	992192	4.99	58	Third Class 528 to 799
12.61	6840210	8.89	103	Fourth Class 779 to 1030
24.68	13390255	12.48	145	1281Fifth Class 1030 to
23.25	12596567	16.02	186	Sixth Class 1281 to 1532
12.47	6764808	16.29	189	1783Seventh Class 1532 to
6.21	3373637	10.34	120	2034Eighth Class 1783 to
1.16	634189	5.08	59	2285Ninth Class 2034 to
0.39	214163	1.89	22	2536Tenth Class 2285 to
0.43	235594	0.68	8	Eleventh Class 2536 to 2790
%100	54240697	%100	1161	Total

Source: the Research Findings 2013

Figure 4: General State of Spread of Iranian Cities Based on Altitude from the Sea Level Source: Research Findings 2013

Based on the map, the spread of Iranian cities based on altitude is shown in which the cities with altitude above 2536 are mostly located in central areas and Zagros Mountains while the other cities with less altitude are located all over the country.

Conclusion

At present, a large proportion of Iranian population of lives in cities. In other words, near 61.3 percent of Iranian population lives in cities. These values have been 54.3, 47.1, 37.9 and 31.4 in the years of 1956, 1966, 1976 and 1986 respectively. It can be claimed that in recent 40 years the Iranian economic-and social events have been influenced by internal and external factors which have moved the country population toward cities. It worth mentioning here that not only has this problem been observed in Iranian context, but also in the other developing countries. Expanding and transferring the political, social economic and cultural events of developed countries to developing countries have challenged the social, economic, political and cultural aspects of these countries and influence their national economy. This process has caused changes in developing countries. One of these outcomes is displacement of population from rural areas toward cities and increasing the population of urban regions in an unexpected way in a short period of time. Based on statistics and data and due to special political and social conditions of Iranian context, compared to other countries, this trend has been occurred very rapidly. The general results of the present study show that the Iranian population in different altitudes has not a balanced distribution so that in low altitudes we have 224 cities then the urban population decreases then increases and finally decreases as the following model:

Increase → Decrease → Increase → Decrease

Unsuitable distribution of the population in different sections of the cities and lack of harmony among different cities of the country according to hierarchical affairs of cities and imbalanced distribution of population in different places have caused severe economic, political and social challenges for the country as the following:

Distribution of city population and changes in hierarchical affairs of cities, population growth of cities and expansion of its sections has no contrast with political and social development. Even the city builders and architectures have confirmed that increasing of city population to 80 percent border is acceptable and helpful. Without considering the necessary infrastructures, the government has announced some places as cities. As we mentioned before, some places have been announced as cities with only with 184 people. So, according to evidences, these decisions have been mere political motives without paying attention to the fundamental and primary conditions.

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