

## **A study on the role of population change in spatial development of Zahedan between 2001 and 2011**

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### ***Abstract***

*The excessive growth of cities and unbalanced growth of them which is resulted from immigrations and population growth are the main problems of Iran urban network. These problems lead to the excessive population density, the increase of construction activities, physical development of urban centers, and destruction of the natural ecosystem. The present paper intends to study the role of population change in spatial development of Zahedan between 2001 and 2011 in Iran. According to the research studies, the residents' information is processed in SPSS environment and via T-test, one-sample test, and Phi and Cramer's V test. The results indicate that the mean of effective economic and political factors in Zahedan, the mean of the number of organizations, and the mean of population equals 3.47 and it is higher than the theoretical mean equal to 3. The level of significance of the test is less than 0.05 (sig= 0.000). In other words, economic and political factors influence Zahedan population development and it indicates that 61.4 percent of immigrants belong to the new districts of Zahedan; it means that the population has grown within the city and has caused the physical development of it.*

***Key words:*** *Spatial development; Population growth; Environmental condition*

### **Introduction**

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Many factors and problems such as the economic, social, political and environmental ones influence the physical growth and development of cities. In fact, the required conditions for physical development of cities are provided by paying attention to the environmental condition and taking advantage of economic, social, and political capabilities. Just like the living organisms, the cities physically grow and their social, cultural, and economic status gradually changes. Certainly, social factors and population changes are the most fundamental factors that cause the rapid urban development. This rapid growth is directly related to the natural growth of population and indirectly to the population immigrations. However, determining the immigration rate and the rate of natural increase of the rapid growth of the urban population is not easy (Sarafi, 2002, p: 41). This amount of urbanization is the result of external factors. In other words, world economic evolutions and colonization in the form of center-periphery relationships have caused excessive urbanization in the developing countries such as Iran. Consequently, the human and material capitals, infrastructural equipment, industries, and activities accumulate in cities, while the productive units in rural areas are destructed. As a result, the rural population is forced to immigrate to the urban areas and to have false jobs. This condition has led to the growth of thousands of parasitic cities in the world and many of them have turned into population, cultural, and economic centers. This rapid growth of population could directly be related to the natural growth of population as a result of health and technological growth over the recent years. Moreover, it could indirectly be related to the population immigrations in the geographical level. Since it is difficult to determine portion of each of the factors in rapid growth of cities, the cities are categorized into the national, regional, and local centers of population. According to Castillo, this method of urban growth and concentration in the Middle East is resulted from the following factors:

The first one is the official and political concentration that has politically made the cities the center of population attraction. The second one is the change in foreign business (the integration into the global economy). The third one refers to the issue of oil that has provided jobs in the region and paved the way for population immigration and urban growth (Castillo, Vincent Francis, 1992, pp: 70-71).

Zahedan is the capital of Sistan-o-Baluchestan province, it is one of the important regional cities of Iran and it is located in the East of it. Zahedan has experienced many periods as a result of its approximately 100 years of residential history. Many of the national decisions have directly affected its development process. Over the recent decades, the attention of Islamic republic of Iran to the marginal regions, a special condition has been provided for the regional development of Zahedan. The development of cities especially the development of Zahedan has new aspects regarding cultural, social, and environmental devastative effects. As a result, valueable surrounding areas of the cities have gradually been destroyed via the urban development process and many other problems have emerged.

Moreover, the urban managers cannot make comprehensive predictions and plans as a result of ambiguity of urban development mechanisms and factors that affect them. Therefore, it is necessary to know the stages of urban development before doing any administrative action. In fact, any kind of planning, and performing social, cultural, and economic projects need precise statistics associated with the population size, age and sex structure s of the population, and other components related to population.

### **Research hypotheses**

- Political and economic factors influence the development of population and finally spatial development of Zahedan
- Inland immigrations play the most effective role in spatial development of Zahedan.

### **Methodology**

With regard to the characteristics of the present paper, the successive studies method related to humanities has been used. The research method is documentary-survey. In other words, the descriptive-analytical method has been applied in this paper. In the descriptive method, field and library data is indicated in one dimensional and two dimensional forms (figure, plan, and map) and then the conclusion is presented.

According to the analytical method (statistical analysis), some indices are considered regarding research hypotheses and operating variables. These indices are in agreement with individual, social, cultural, and environmental variables.

By considering the research hypotheses, a questionnaire is provided and the information is quantitatively and statistically analyzed. The questions are designed for people who have lived in the development area of Zahedan from 2001 to 2011. The responses to the questions will determine the cause of the urban spatial development.

#### **The method and tools of collecting data**

Documentary and library method: the data related to the theoretical principles has been gathered via internet and library. The population-statistical information has been gathered via the website of statistical center of Iran and other relevant websites. Moreover, the information is also collected with the collaboration of municipality, housing and urban development office, and management and planning organization of Sistan-o-Baluchestan province.

Field method: the needed data has been collected via interviewing the purpose population, survey method, responding to the questionnaire, and direct observation.

## Method of data analysis

In order to analyze data, the descriptive-analytical method, and then the statistical method via SPSS software have been used. Moreover, the descriptive-inferential statistics of parametric and non-parametric tests are used to confirm the hypotheses, T test is used to compare and recognize the differences and cause-effect relation, single-sample test is used to find a conclusion for hypotheses, Cochran test is used to measure validity of the questionnaire, and finally GIS is used to make a map.

## Statistical population

The statistical population of the present paper not only encompasses the population of Zahedan, but also the population of neighborhoods that have been developed between 2001 and 2011. Jahad and Barq, Mehrshahr, Resalat, and Hematabad are some of the mentioned neighborhoods. Some questionnaires related to spatial development have been completed in these areas.

## Geographical location of the studied area

Sistan-o- Baluchestan is the largest province in Iran. It is located between the 25 degrees and 3 minutes north latitude to 28 degrees and 4 minutes, and also between the 58 degrees and 50 minutes to 60 degrees and 23 minutes east longitude. It has an area over 180000 km<sup>2</sup>. It has borders with Khorasan province from North, Kerman and Hormozgan provinces from West, Afghanistan and Pakistan from East, and sea of Oman from South. Its west area is flat and next to Lut dessert and its east area is higher. Zahedan is the capital of Sistan-o-Baluchestan province in the East of Iran and close to the borders of Iran, Afghanistan, and Pakistan. Zahedan is restricted to city of Zabol from North, Afghanistan from East, Khorasan province from North-West, Kerman province from West, Iranshahr city from South-West, Pakistan from East, and Khash city from South-east. It has an area of 36581 km<sup>2</sup>. Its height from sea equals 1378 meters. It is located between the 60 degrees and 30 minutes and 45 seconds of East latitude to 28 degrees and 4 minutes, and also between the 29 degrees and 30 minutes and 45 seconds of North longitude.

## Discussion and results

### Demographic characteristics of questionnaire respondents

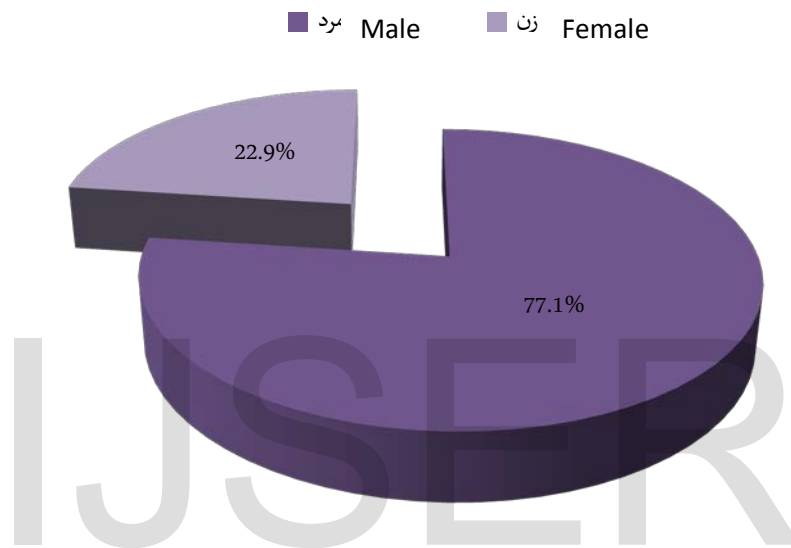
#### Sex

**Table 1:** frequency distribution of respondents' sex

Sex	Frequency	Percent	Valid percent
Male	225	74.0	77.1
Female	67	22.0	22.9
No response	12	3.9	
Total	304	100.0	

Source: the researcher

According to table 1, majority of the respondents are male (77.1%), and the rest of them are female (22.9%).



**Figure1:** frequency distribution of respondents' sex

## Age

**Table2:** frequency distribution of respondents' age

Age	Frequency	Percent	Valid percent
15 to 25 years old	40	13.2	13.2
25 to 35 years old	98	32.2	32.5
35 to 45 years old	94	30.9	31.1
45 to 55 years old	51	16.8	16.9
Over 55 years old	19	6.3	6.3
No response	2	.7	
Total	304	100.0	

Source: the researcher

According to table 2, 32.5 percent of respondents are 25 to 35 years old, 13.2 percent of them are 15 to 25 years old, 31.1 percent of them are 35 to 45 years old, 16.9 percent of them are 45 to 55 years old, and 6.3 percent of them are over 55 years old.

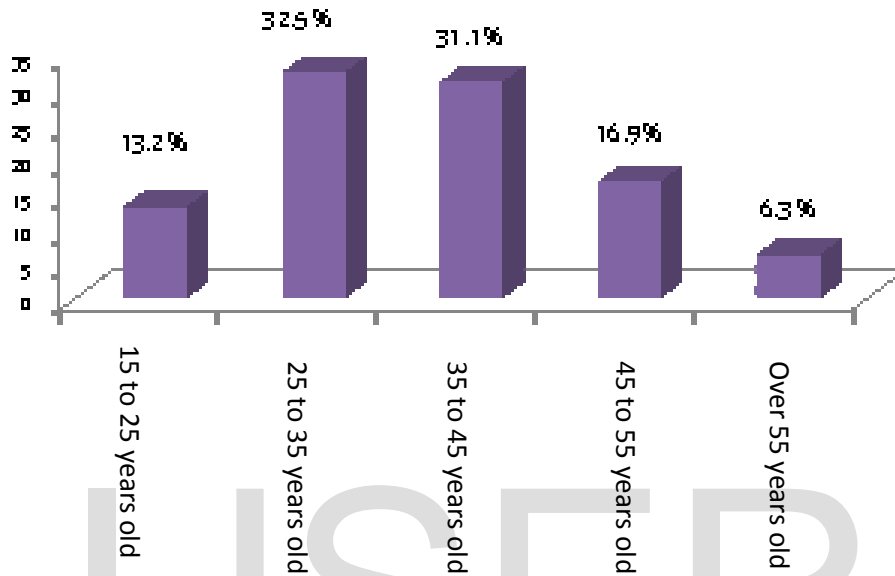


Figure2: frequency distribution of respondents' age

### Testing hypotheses

- Political and economic factors influence the development of population and finally spatial development of Zahedan

**Table 3:** one-sample statistics

One- sample statistics			
Number	Mean	Standard deviation	Mean standard error
304	3.4702	1.01358	.05833

Source: the researcher

**Table4:** one sample-test

One-sample test					
Test value= 3					
t	Degree of freedom	Level of significance	Mean difference	Confidence interval 95%	
				Low border	High border
8.062	301	0.000	0.47020	0.3554	0.5850

Source: the researcher

In order to test the above hypothesis, the comparison of mean of one-sample test has been used.

According to table4, the mean of effect of economic and political factors on population development of Zahedan equals 3.47, while it is higher than the theoretical mean equal to 3. With regard to the test level of significance which is less than 0.05, it is true to say the obtained result could be generalized to the statistical population. In other words, the researcher’s hypothesis is confirmed and it means that political and economic factors affect the population development of Zahedan.

- Inland immigrations play the most effective role in spatial development of Zahedan.

**Table5:** spatial development of Zahedan

Spatial development of Zahedan (population increase)		Inland immigration	
Very low	Frequency	Yes	No
		Percent	8
Low	Frequency	33	7
	Percent	15.0	9.2
Average	Frequency	44	23
	Percent	20.0	30.3
High	Frequency	115	31
	Percent	52.3	40.8
Very high	Frequency	20	8
	Percent	9.1	10.5
Value of Phi and Cramer’s V: 0.176      level of significance:0.049			

Source: the researcher

In order to test the above hypothesis, Phi and Cramer’s V test has been used.

According to table 5, many of the people who have gone from Zahedan to its new districts believe that the population of districts has noticeably increased. Moreover, the test level of significance is less than 0.05, therefore, the obtained result could be generalized to the statistical population and the researcher’ hypothesis is confirmed. In other words, inland immigrations play the most effective role in spatial development of Zahedan.

## **Conclusion related to the population growth and physical development of Zahedan (2001-2011)**

Many factors have caused the population growth and physical growth of Zahedan between 2001 and 2011. Good weather, better environmental condition than other cities of Sistan-o-Baluchestan province in the drought years over the recent decade, political, and administrative issues, being the capital of the province, the concentration of services in Zahedan, attractions of Zahedan, dedication of construction budgets to it, high population of governmental employees, and the academic places in Zahedan are some of the factors that have attracted a high population to Zahedan and have led to its continuous growth. Directly and indirectly, the railway construction by Britons (1925) led to the growth of Zahedan and also the exploitation of Kerman-Bam-Zahedan railway led to the connection of the East Asia railways to Europe railways. The economic growth of Zahedan, the motivation to increase producing activities, and the improvement of social status and relative welfare caused Zahedan population growth and its physical development. The mentioned railway provided a possibility for businessmen to transfer their goods to Europe, the Middle Asia, and South-East Asia. This railway led to energy economy, a decrease of roads traffic, providing employment in the East and South-East of Iran, connecting Zahedan to Turkey's rail network via Razi boundary, and economic development of Sistan-o-Baluchestan province and Kerman. Zahedan-Kerman railway is very effective regarding fuel and goods transportation. Moreover, it decreases costs. There are freight trains to transfer cement and liquid gas in Zahedan-Kerman railway and a massive volume of oil products will be carried via freight railway after constructing the branch line of Zahedan oil storing.

The immigrations have also affected the economic and social condition of the city. The economic effects of immigration depend on the type of immigrants, education, economic resources, age, and sex. Some of the immigrants have improved the economic condition of Zahedan via increasing the salary. Producing financial capital, and having a considerable demand for commodities. On the other hand, some of the immigrants damaged the city by increasing the unemployment. The immigrants' lifestyle and how they gain money affect the population density of Zahedan, facilities distribution, and urban services. Any city has a tendency to growth and Zahedan is one of the cities that have grown with regard to its everyday population growth. The population of Zahedan was increasing up to 1996 and its reason might be the drought of late 1960s in Sistan-o-Baluchestan. In fact, the drought forced many people to immigrate to Zahedan, as a result the population growth rate suddenly increased in Zahedan.

The political evolutions that refer to the huge immigration of Afghan refugees to Zahedan are the most important reason for the growth population and spatial development in



Zahedan. According to the statistics of the general administration of foreigners, 179404 Afghans were living in Zahedan in 2001. The spatial development of Zahedan refers to the immigration from the neighbouring cities and other provinces to Zahedan as a result of low cost of constructing houses there. Sistan-o-Baluchestan is neighbor of three provinces of Hormozgan, Kerman, and South- Khorasan. It is also the neighbor of the country of Pakistan from the East. Zahedan is connected to Taftan Mountain via Mirjaveh road and Pakistan via Nok Kandi road in the East, Bam and Kerman via Nosratabad road in the West, Nahbodan, and Birjand in South Khorasan province in the North, and Khash, Iranshahr, and Chabahar in the South. The road is one of the most important infrastructures that cause economic interactions. Therefore, the relation of Zahedan with the aforementioned internal and external cities provided the possibility for this economic interaction. Quetta is a large city in Pakistan and it is located across the Nok Kandi road. It seems that among the border cities close to Iran, Zahedan has the best economic activities and performance. Moreover, Kerman, Birjand, and Iranshahr are internal cities that respectively have the most contacts with Zahedan. With regard to the closeness of Zahedan to the border and its neighborhood with Pakistan, the economics of Zahedan is influenced from different aspects. Generally, the economic structure of Zahedan interacts with the neighboring countries. The most important economic activity of Zahedan refers to services. The services include commercial activities and illegal trafficking. After services, industry and after the industry, agriculture is the important economic sector of Zahedan. In a nutshell, the economic structure of Zahedan attracted capitalists, provided industrial and service job-opportunities, attracted the population, and helped the development of the city.

## **Conclusion**

The relation between birth rate and death rate affects the growth rate and population size. Though the factor of immigration affects population growth, death rate and birth rate are determining factors for the population growth of a society. In a great part of the human's history, children's birth and death rates were high and death rate indicated that many people died at very early ages. People still believe that many of the children will certainly die; therefore, they have many children. They think that having a large family is valuable and a large family is a working source for parents' old age. When children's death decreases and the elderly live longer, people do not decrease their fertility. Consequently, birth rate keeps its increasing trend and population size unbelievably increases. If the birth rate reaches its lowest level, the population will grow for a while and it is because of the presence of children who were born before the decrease of birth rate. According to the maps related to city development and population statistics in different periods, it is clarified that after the primarily construction of city, the development of city has had different aspects regarding population changes. According to the census of 1956, Zahedan had a population of 17495 people, a population of 39732 people in 1966, and populations of 39740, 281923, 356389,

41518, 567449, and 560725 people in 1976, 1986, 1991, 1996, 2006, and 2011 respectively. It is concluded that Zahedan has had a very rapid growth of population and development of city. At first, urban development has been radial. It means that it began from the center of the city, and then a series of concentric circles were formed. Since many of the commercial activities, shopping centers, commercial administrations, and so forth were concentrated in the center of the city, the population was attracted to it. Consequently, the price of houses and land was higher in this area. The urban development and population growth continued their radial trend; however, because of some restricting factors it found a linear development.

Since the land and house were expensive in the center of the city, people immigrated to the surrounding areas of the city and they formed marginal areas in the East and North of Zahedan (areas with no construction plan). Moreover, the government granted its employees some regions in the West of Zahedan, and Mehr houses were made in the East of it. Over the recent decades, Zahedan has had an unbalanced growth that has led to the social inequity especially regarding educational and welfare facilities among different regions and citizens.

**There is no conflict of interests among the authors.**

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