ENVIRONMENTAL IMPACT ASSESSMENT OF URBAN DEVELOPMENT PATTERN ON MARGINAL AREAS (CASE STUDY: ZABOL CITY)

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Abstract. Environmental assessment of urban development on marginal areas in Iran as an inevitable approach to assessing the degree of compatibility of this policy with sustainable urban development components seems to be necessary due to its wide impact on the ecology of cities in Iran. In this framework, the main objective of this article was to assess the environmental impacts of urban development on marginal areas in Zabol city. The research method in this research in terms of research goal, is Applied, and in terms of the research framework, it is analytical and descriptive. SPSS and Expert Choice software were used to analyze the data. The results of single-sample T-test of the environmental indicators in the marginal areas of Zabol city, as well as the environmental impact on the marginal areas, showed that in all indicators, the average obtained is above the average of 3. In fact, the results show the environmental impact of the urban development pattern in the marginal areas of Zabol city is high. In the following, Spearman correlation test has been used to determine the relationship between these two variables (Environmental impacts of developmental pattern and marginal areas). The results showed that there is a significant relationship between the environmental impacts of urban development and marginal areas, with a significant level of 0/00. Finally Expert Choice software is used to evaluate and rank the most important environmental impacts of urban development pattern on marginal areas from experts' point of view. The results showed, among the desired indicators, air pollution with a weight of 0.374, soil pollution with a weight of 0.220, water pollution with a weight of 0.177, vegetation changes with a weight of 0.125 and noise pollution with a weight of 0.105 ,respectively, have the highest and lowest weights.

Key words: Environmental Impacts, Urban Development, Marginal Areas, Zabol.

Introduction. Earth is an absolute and constant phenomenon, however, under the influence of various factors such as the development of cities, the integration of villages in the physical fabric of cities, the growth of residential and industrial units, the change in patterns of land use and maladministration, it significantly decreases. Comparing the growth of urban population with their employment, it turns out that as the population grows, spaces around cities are also occupied, and in most cases, such as the cities of Bangkok, Sao Paulo, Tehran and Tabriz, the amount of land occupation is far ahead of population growth. Therefore, it will destroy the most favorable and fertile agricultural lands, and it also causes the vulnerability of life cycle, plant and animal organisms, as well as natural landscapes (Mohammad Zadeh, 2007, 93).

In today's world, the relationship between human society and the natural environment is influenced by the phenomenon of urbanization and urban development. It is a phenomenon that has a global character and is constantly increasing. Urbanization and urban development are undoubtedly the special aspects of new civilization. The intense migration of villagers to cities has caused the city to grow and expand, and a massive and massive urban population.

The rapid growth and horizontal expansion of cities in recent decades has caused almost all countries in the world (both developed and developing) face serious problems. The issues of this phenomenon not only overshadow urbanization policies, but its consequences have played a key role in exacerbating the economic, social, political, managerial and environmental issues of societies. As the everyday conflict of today's human with the complications of environmental degradation, indicates the violation of nature areas by human (Bahraini, 1997).

Urbanization and population growth and the effects of climate change in the environment are one of the most urgent issues facing the world today (Clark, 2009). Environmental problems are one of the most important issues in today's city and the result of conflict and their opposition to the natural environment. Because urban development is necessarily associated with the domination of buildings, industries and transportation and economic activity on natural spaces, which the city's dominance over nature changes over time and causing massive urban pollution (Rabieifar et al, 2013). The massive influx of people into the natural resources of the earth has caused many environmental problems. Today, 99 percent of all species that have been living on Earth since its creation have been extinct (Ben-Sun, 161: 2003).

Growth and development of urban life with increasing population and the growth rate of immigration, has caused the inhabitants of large cities to face a lot of environmental and spatial constraints in a dense space with many residential, social, administrative and occupational needs. Providing these needs and solving many problems in the dimensions mentioned is one of the most important issues of interest to planners, responsible and, most importantly, earth sciences researchers, especially environmental and geography scholars. Though, in this context, relations between citizens and

residents in most human groups in different domains have a social approach, which the type of association of these groups with the living environment is investigated (Maleki and Sa'idi, 2016).

Over the past decades, Iran has been affected by the phenomenon of urbanization and on the other hand, it has experienced increasing energy consumption (especially fossil fuels) due to its high energy resources. These two factors, coupled with the low level of environmentally friendly technology, have led the country to face environmental challenges. Therefore, it is important to study the energy consumption status, air pollution and the emergence of urbanization during economic growth. The urban population is constantly expanding, due to different immigration reasons. Therefore, the urban environment has been defeated by the massive flood of human populations and will be helpless to meet the needs of the inhabitants. This has caused a lot of pressure on the urban environment and there will be a lot of problems, including heavy traffic, noise pollution, air pollution, lack of facilities for citizens, and so on. In fact, one of the most important impacts of urbanization on the environment is environmental contamination. Today, the environmental situation is such that people in a city or country are not even safe from pollution in another city or country, and all of this environmental pollution ultimately leads to: infectious diseases, endangering people's health and the destruction of the environment. According to the fifty principle of the constitution of the Islamic Republic of Iran, which regards environmental protection as a national duty, and since every human being is in an environmentally-friendly manner, therefore, the existence of a clean, healthy and calm environment requires the proper planning of directors and the active and responsible participation of all citizens (Zarger et al., 2014).

The rapid increase in urbanization, without accompanying the growth and development of economic and social indicators as a prerequisite for sustainable urbanization, has hit the cities with many problems. One of these problems is marginalization. Marginalization in terms of environmental health, mental health, social health, urban sustainability, etc., has devastating consequences on sustainable urban development. Margins, with characteristics such as low quality of life, bad housing conditions, high population density, low urban services, etc., and marginalized people with characteristics such as low literacy, unemployment, uncertain jobs, etc., provides a favorable environment for the growth and emergence of various types of social damages such as addiction, theft, spree, sale and consumption of drugs, sale and consumption of alcoholic liquorices, prostitution, and so on, which could be a serious threat to sustainable urban development (Naghdi and Zare, 2011, 125).

In Sistan, some factors such as: the economic downturn in the villages, unemployment of a big number of extra force in agriculture, the lack of appropriate extension of service infrastructure in villages, successive droughts in the area and the existence of better employment and income in the cities, has exacerbated the severity of rural migration in recent decades. This process has had many consequences for the origin and destination of immigration. These include the following: emptying many of the villages, the inactivity of the remaining population in the villages, extension of urban marginalization, increasing social and moral anomalies in cities, the lack of dynamics of national and regional economics and in general the lack of appropriate urban and rural development in the region. The imbalance in the availability of facilities has caused a large part of immigrants to immigrate from the surrounding villages to the city center, Zabol, and its spatial and physical appearance is visible in the marginal neighborhoods of the city. The border areas are the first stopover for immigrant groups in the suburban areas and shelters. These areas offer accommodation for these immigrant groups, to be considered as a reserve in easier conditions for possible recruitment in the city. In recent years, the development of the city's marginal areas has been so high, that physically, most of the physical space and the area of the city in the eastern part of the city belong to the informal urban spaces, which is scattered, irregular and very inappropriate with the environment, and created a serious social concern among urban and regional managers (Ziaeifard, 2015). In this regard, the aim of the present study is to investigate the environmental impacts of urban development patterns on marginal areas (Case study of Zabol city).

2- Background research. In a study, Naghd and Zare (2011) studied the biological margin pattern, which is a threat to sustainable urban development. Findings of the research show that, about 63 percent of the respondents, or not at all satisfied with the health status of their neighborhood or had little satisfaction. The marginalized households in terms of housing quantity, on average, just had two rooms. About 43% of them have evaluated their financial and economic status in terms of the prevalence of poverty in the neighborhood, "bad" and "weak".

Nawabakhsh and Rahmani (2010) have investigated the pathology of tower making in the environmental pollution of urban spaces (case study of Arian Hamadan tower). The results showed that, on the one hand, the spatial deployment of the tower and the dense sale, regardless of the spatial system and psychological, emotional and behavioral needs, have shuffled the balance of the environment and social space, and on the other hand, the height of the tower, its aspect and the length and width of the street are not coordinated with all kinds of existing uses. In other words, citizens' rights in the environment and to the urban space in which they live are not protected. In general, the shape and function of the tower has damage the balance of the site, and an inappropriate network service provider has greatly reduced the quality of shipping flow, which itself has environmental harmful effects.

Maleki and Saeedi (2016) studied the environmental dimensions and urban environment status in Iran's development plans. This study, with a general look at the status of the environment in the country's development plans, emphasizes the role of the urban environment in these programs. By reviewing the development plans of the country, it is obvious that it is necessary to pay attention to the status of the environment in the process of drafting and approval of the laws. Some factors such as: inconsistency in the implementation, lack of necessary infrastructure, parallel management, failure to establish executive regulations at the right time, and overtaking economic considerations, than necessities of environmental protection, has led to a reduction in the effectiveness of the legal provisions approved in the programs.

Romiani et al. (2016), in a study entitled "Investigating and optimizing urban development with emphasis on environmental protection in Hamadan", showed that, agricultural lands and gardens declined sharply as a result of construction. Therefore, using the AHP model, land characteristics were divided into five categories based on urban development needs from "perfectly suitable" to "completely inappropriate". Until city's future expansion, only occur in non-vegetable lands with suitable conditions for physical development of the city. The results of satellite images evaluation showed that the highest increase in the level of use in the urban area of Hamedan has been occur during the mentioned years.

Jafari and Habibpour (2008) have investigated and evaluated the effects of the development of new cities on the environment (Case Study: New Town of Pardis Tehran). The results show that the most important negative effects of the new Pardis town in the construction phase, considering the location and characteristics of its natural environment, are as follows: Changes in the natural form of the earth, morphological variation of valleys and disturbing the natural order of the hydrological system, destruction of vegetation and animal habitats and cut off the wildlife migration routes. In the stage of population settlement, the most important effects include the following: increasing the sound level of the area, production and disposal of solid wastes, production and disposal of sewage, effect on flood regime in the region and changing the nutritional behaviors and wildlife migration. The most important solutions to reduce the problems mentioned in the construction phase include: adherence to the natural form of the earth and the least change in the longitudinal and transverse profiles of valleys, avoiding over-required land preparation, before reaching the specified density level in existing phases, and prevent prolongation of the project's implementation. At the stage of population settlement also includes: traffic management, proper disposal of solid waste, development of sewage collection and purification network, preserving natural wildlife migration routes, creation and development of urban green space establishing a green belt around the city to restrict and inhibit illegal development.

Mohammad Zadeh (2007) examined the environmental impacts of the accelerated physical development of the city of Haf with an emphasis on the cities of Tehran and Tabriz. The results of this study show that, with approaching environmental objectives by planning and design, in addition to preserving agricultural lands, the level of environmental vulnerability can be minimized. Setting up land use patterns, establishment of principled criteria for the separation of land, increased construction density and most importantly, increasing social awareness and the creation of general beliefs about the unmatched land, are the key tools of this management.

Zhuang Yupo and his colleagues in 2013, In an article entitled "Sustainable Development of Coal Cities in Hellong Jiang Province, Based on the AHP Approach", evaluated the sustainable development of Northern China mineral cities using the AHP method and using a comprehensive fuzzy assessment methodology and the formation of an assessment matrix of five aspects: economic development, environmental quality, resource status, social balance, and government management ability. The results of the research show that "economic development" and "environmental quality" are the most important indicators that influence the sustainable development of the mineral cities of this province (Perozon et al., 2017).

3- The introduction of the studying area. Zabol is located the geographical coordinates 31 degrees' north latitude and 61 degrees and 2 minutes and 39 minutes east. The extent of Zabol is 2084 hectares, which is equal to 0.13 percent of the area encompasses the city. Zabol in term of land distance is 210 km from Zahedan city in southeastern, 1538 km north of Tehran, 366 km North West of Birjand and 834 km from Mashhad and thus be associated with the centers of neighboring provinces and other parts.

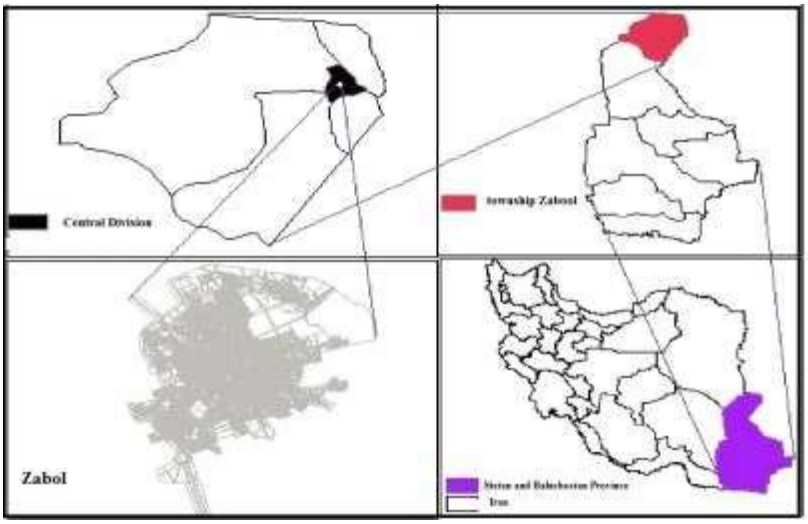

Figure (1): position in the region, Sistan-Baluchistan province

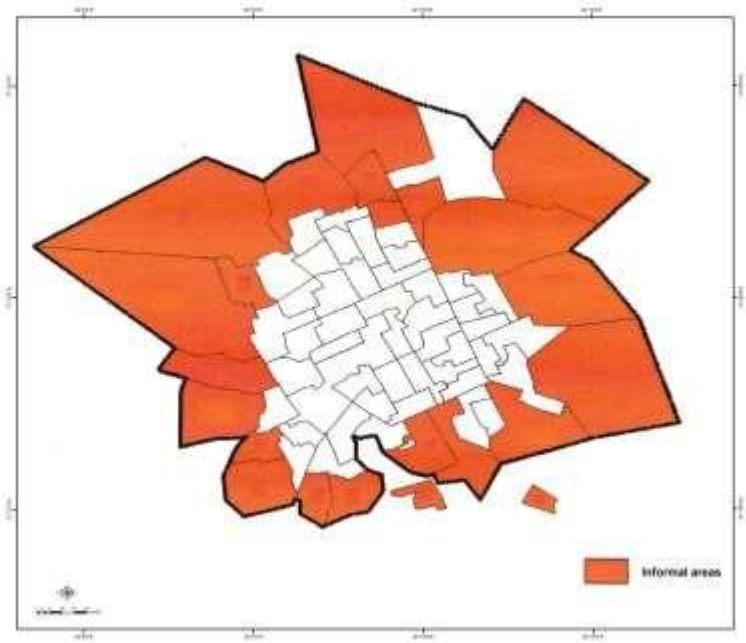

Figure (2): Situation of informal neighborhoods in Zabol

4- Research Methodology. The research method in this research in terms of research goal, is Applied, and in terms of the research framework, it is analytical and descriptive that is conducted in a survey method and at the level of the periphery of the city of Zabol. The information gathering tool includes observations and a researcher-made questionnaire (Structured Interview) based on environmental criteria along with some subcategories. Eventually, 150 people were selected through targeted sampling and 20 officials in a targeted sampling with the subject. Field studies, including environmental observations, have been carried out to determine the environmental impact on marginal areas. In this research, we used weighting techniques and Expert choice and SPSS software for gathering information.

4-1- Research Indicators

Table (1): Environmental indicators and its subcategories

Environmental indicators	
water pollution	water pollution Superficial
	water pollution underground
air pollution	
Soil pollution	Erosion
	Soil contaminant
	Change topography
	Solid waste
Noise pollution	
Vegetation changes	Reducing native plant species
	Planting non-traditional serious plant species

Source: Hosseini et al., 2015

Table (2): Environmental impact indicators on marginal areas

Dimensions	Component	Indicator
social	Employment	income Security
		Job security
	Education	Access to training centers
		Satisfaction of educational facilities
	Sanitary	Access to health centers
		Access to safe water
		Health of the environment
		No disturbance to the smell of wastewater
		The absence of infectious diseases
	Access to services	Satisfaction with the functioning of institutions
		Satisfaction of access to space
		Quality way
		Appropriate transportation
		Satisfaction of recreational facilities
	Social and psychological safety	social justice
		Lack of tension
		Life satisfaction in marginal areas
		Participation in marginal areas
		Satisfaction with security
		Level of belonging to the marginal areas
		The opportunity to progress

Source: Sadeg Beigi et al., 2013

5- Research findings

5-1- Investigating environmental indicators in the peripheral regions of Zabol

In this section, the amount of environmental indicators in the peripheral areas of Zabol city has been evaluated according to the average of each index, and using one-sample t-test, the rates of each of the indicators was obtained.

Table (3): One-sample t-test

The difference 0.95		Significant (second range)	T	Mean	Indices
Top	Top				
3.14	3.33	0.000	46.550	3.23	water pollution Superficial
3.16	3.35	0.000	46.824	3.25	water pollution underground
3.16	3.34	0.000	49.488	3.25	Erosion
3.31	3.52	0.000	46.549	3.42	Soil contaminant
3.15	3.34	0.000	46.900	3.24	Change topography
3.25	3.45	0.000	47.462	3.35	Solid waste
3.15	3.34	0.000	46.627	3.24	Reducing native plant species

Source: research findings

As the results can be deduced, in all indices the mean obtained is higher than the average of 3. In fact, the results show the high environmental impact of the urban development pattern in the periphery of the city of Zabol.

Table (4): One-sample t-test

The difference 0.95		Significant (second range)	T	Mean	Indices
Top	Top				
3.10	3.31	0.000	43.149	3.21	income Security
3.29	3.48	0.000	48.628	3.39	Job security
3.25	3.46	0.000	45.424	3.35	Access to training centers
2.97	3.14	0.000	48.071	3.05	Satisfaction of educational facilities
3.43	3.66	0.000	40.489	3.22	Access to health centers
3.12	3.33	0.000	41.400	3.21	Access to safe water
3.14	3.30	0.000	43.505	3.22	Health of the environment
3.08	3.26	0.000	47.383	3.17	No disturbance to the smell of wastewater
3.01	3.20	0.000	44.151	3.11	The absence of infectious diseases
3.19	3.31	0.000	45.119	3.26	Satisfaction with the functioning of institutions
2.99	3.17	0.000	46.129	3.08	Satisfaction of access to space
3.16	3.36	0.000	45.192	3.27	Quality way
3.18	3.36	0.000	50.257	3.27	Appropriate transportation
3.31	3.51	0.000	48.715	3.41	Satisfaction of recreational facilities
3.19	3.37	0.000	50.216	3.28	social justice
3.25	3.43	0.000	50.175	3.34	Lack of tension
3.22	3.40	0.000	48.912	3.31	Life satisfaction in marginal areas
3.32	3.56	0.000	43.672	3.41	Participation in marginal areas
3.45	3.67	0.000	45.562	3.54	Satisfaction with security
3.56	3.78	0.000	45.653	3.66	Level of belonging to the marginal areas
3.23	3.50	0.000	41.443	3.34	The opportunity to progress

Source: research findings

As can be seen in the table above, in all indices the mean obtained is higher than the average of 3. In fact, the results show the high environmental impact of the urban development pattern in the periphery of the city of Zabol.

In the following, using the Spearman correlation test, the relationship between these two variables (the environmental impacts of the development pattern and the marginal areas) has been discussed.

Table (5): Spearman correlation test

SIG	Sperman s rho correlation Sig.(2-tailed) N	Dependent variable	Independent variable	
0.000	0.700	Marginal Areas	water pollution Superficial	Environmental effects
0.000	0.787	Marginal Areas	water pollution underground	
0.000	0.757	Marginal Areas	Erosion	
0.000	0.867	Marginal Areas	Soil contaminant	
0.000	0.874	Marginal Areas	Change topography	
0.000	0.693	Marginal Areas	Solid waste	
0.000	0.853	Marginal Areas	Reducing native plant species	

Source: research findings

According to Table 5, there is a significant relationship between the environmental impacts of urban development and marginal areas with a significant level of 0/000.

Investigation and ranking of environmental impacts of urban development pattern on marginal areas using Expert Choice software

In this study, decision-making groups (urban planners and experts in this field)

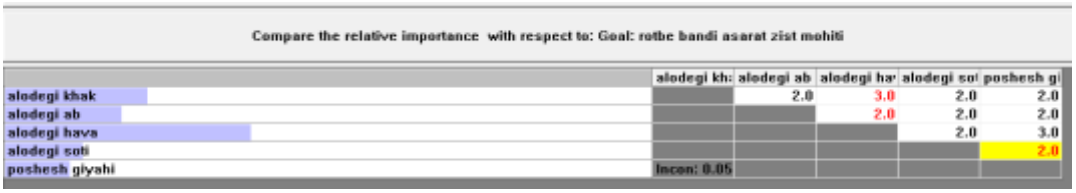

Figure (3): Weighting agents

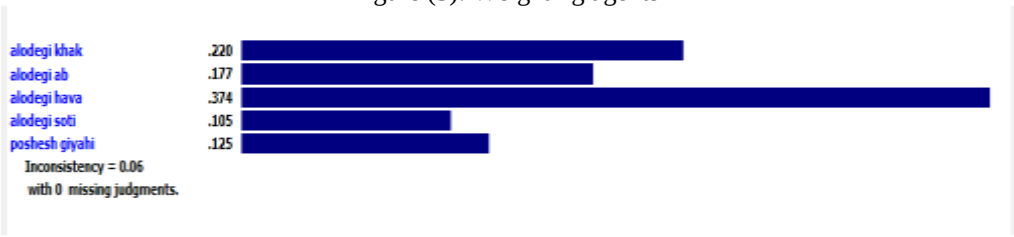

Figure (4): The final weight of the agents

As can be seen in Fig. 1 and 2, among the desired indicators, air pollution with a weight of 0.374, soil pollution with a weight of 0.220, water pollution with a weight of 0.177, vegetation changes with a weight of 0.125 and noise pollution with a weight of 0.105 ,respectively, have the highest and lowest weights.

Conclusion. Over the past decades, Iran has been affected by the phenomenon of urbanization and on the other hand, it has experienced increasing energy consumption (especially fossil fuels) due to its high energy resources. These two factors, coupled with the low level of environmentally friendly technology, have led the country to face environmental challenges. Therefore, it is important to study the energy consumption status, air pollution and the emergence of urbanization during economic growth. The urban population is constantly expanding, due to different immigration reasons. Therefore, the urban environment has been defeated by the massive flood of human populations and will be helpless to meet the needs of the inhabitants. This has caused a lot of pressure on the urban environment and there will be a lot of problems, including heavy traffic, noise pollution, air pollution, lack of facilities for citizens, and so on. In fact, one of the most important impacts of urbanization on the environment is environmental contamination.

The results of single-sample T-test of the environmental indicators in the marginal areas of Zabol city, as well as the environmental impact on the marginal areas, showed that in all indicators, the average obtained is above the average of 3. In fact, the results show the environmental impact of the urban development pattern in the marginal areas of Zabol city is high. In the following, Spearman correlation test has been used to determine the relationship between these two variables (Environmental impacts of developmental pattern and marginal areas). The results showed that there is a significant relationship between the environmental impacts of urban development and marginal areas, with a significant level of 0/00. Finally Expert Choice software is used to evaluate and rank the most important environmental impacts of urban development pattern on marginal areas from experts' point of view. The results showed, among the desired indicators, air pollution with a weight of 0.374, soil pollution with a weight of 0.220, water pollution with a weight of 0.177, vegetation changes with a weight of 0.125 and noise pollution with a weight of 0.105 ,respectively, have the highest and lowest weights.

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