

The Growth of Urbanization and Environmental Instability: A Case Study in Ahvaz Metropolis

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Abstract

Uncontrolled growth of urbanization has been exposed major quantitative and qualitative developments at the beginning of twenty-first century. Current world has been much urbanized and proportion of urban population to total population has been changing and increasing more than before and human modern civilization has been directing to urbanization and this urban growth has served natural resources in its service end. Finally, the result is damaging the ecological system and the unstable environment in cities. Accordingly, we are faced with the questions of how the capacity of cities against environmental problems is caused by urban development and the use of biological resources. These questions are as follows: what is the biological capacity in cities? Does the environment can reconstruct degradation and changing posed by the cities with this level and speed? How much is the amount of urban environmental sustainability to cope with these changes? The role of the city in environmental instability becomes more clear when we know that just about three-quarter of natural resources has been consumed one-fiftieth of the world and the rate of environmental pollution production in cities are three-fourth of the total pollution. Ahvaz metropolis has been chosen as a case of study of the related issue.

Keywords: urbanization growth, environmental instability, urban environment

Introduction

A live city is a city where you can experience a healthy life in it. This city must be a beautiful, valuable and safe city and open areas and green spaces should be accessible. The combination of these ideals, nowadays, are called ecological city that has proposed a new terms as a sample in the scientific literature which named, "Environmental sustainability in different sciences". However, these ideal and ecological features are less clear and obvious in twenty-first century cities. Economic, social, physical problems and issues, and the problem of environmental pollution has made it difficult to achieve this ideal situation. Ecologically, balance and peace has left modern urban –oriented and modern city has a high inputs (energy and resources) and outputs (emissions), unlike the pas sustainable cities (Arjmand nia, 1980). Today , the significant relationship between man and his environment is severely threatened as a result of concentration of population in cities and unbridled use of chemical products and of critical phenomena such as housing, transportation, the economy and income,

Also, the use of fossil fuels causes air pollution and distribution of toxic gases in the air. Noise and air pollution increases the risk of various diseases in human and human's peace has been in danger. Ground and surface waters have been contaminated by a variety of municipal wastewater. Peoples living in the city has been far from nature and people do not feel it, where some people often see themselves not in accompany with nature but in opposite of the nature. So, the polluted urban environment has changed the city into an evil, which necessitates the consideration and organization of urban environment by increased and uncontrolled urban and variety in urban environmental issues and their interactions.

Objectives of the study

The purpose of this study was to evaluate the effects of urban development on environmental instability index and the acquisition and recognition of environmental pollutions caused by uncontrolled development of cities and providing solutions and ways to control environmental pollution with focus on Ahvaz metropolitan city to provide favorable life conditions.

Methodology

The combination of research and analytical methods and libraries are used in the recent study.

Theoretical research principle

Urban Environmental Sustainability

Urban environment is the areas that surround the city's residents, where life and live exist in it. Urban environment is composed of three main parts including the natural environment of the city such as landscapes, gardens, the social and economic environment of the city, and artificial context of the city.

The above three areas interacting with each other is called the urban ecological environment in a holistic view, named "urban ecosystems" as well (Mohammadi 2006) . The term "stability" which has been proposed officially. For the first time, in a pattern form for sustainable development, by Brant land in Our Common Future Report, referred to a proper utilization of basics , natural , financial and human resources and supplies to achieve desired consumption pattern which is just possible by applying appropriate technical and organizational structure to continually meet the needs of present and future generations. An ecologically sustainable city is a city that has exploited the natural resources of the region properly and is self -sufficient , it gives identity to its inhabitants and the vast majority of the inhabitants live in this space are satisfied (Ziyari , 1980).

The aim of the sustainability of the urban environment is that the capital or resources are maintained or at least remains constant , the land is a natural resource that has been entered as a major issue in the economy .

The economy was, in fact, the starting point of resources economic (Suri et al , 2008). Cities with its whole contents and resources would form artificial environment or thinking biological environment. This kind of environment reflects the cultural quality of each society and it is used as an index to recognize the mindset and quality of each society (Soltani , 1986).

Natural and ecological process of the city is emphasized to reduce waste and recycling, reduce pollution, and improve energy efficiency, water use and protection of green areas and landscape. On this basis, one-dimensional stability is not possible in ecological environment and environmental sustainability requires a sustainable urban economy, housing, urban sustainability, and other aspects of sustainability, named as equality of generation and social justice and equity generation and the next generation.

The environmental sustainability means protecting the environment for the survival of entire communities in a justice system, and not just to maintain the current condition in environmental advantage for hedonism of the minority in the world (Sarrafi , 2003). Environmental sustainability has been known as the foundation stone for sustainable development and the United Nations has declared that attention to terms of place in the program is the most important principle in scheduling (Khaledi , 1993). Land use must be great attention for sustainable urban ecology because it has a key role to provide water, energy , food and green space.

It is also necessary to consider natural disaster such as floods , earthquakes , drought , dust , etc., which have a significant impact on the sustainability of the urban environment.

Cities and instability in ecosystems

The researchers have focused on significant issues by looking back to the expansion in urbanization during recent century. For example, the growing urban population in the world was immethodical and inappropriate with environments capacity after the years 1950 up to now, as the world's population in 1950 was less than 30 % of the world population while this values increased more than half of the world in 2000 and would increase to 60% till 2025.

Statistics show that in 1952, there were only a city with more than a million people in the world while this amounts reached to nineteen cities in 2000 with more than ten million people and the number of mega cities are more than a hundred cities in the world. Evaluation of urban development during the past few decades indicates the fact, that the urban and urbanization is experiencing critical changes because today's world is facing uncontrolled expansion of urban phenomena and problems and environmental damage (Parker, 2002). Since there was just 150 million of the world's 5.1 billion population lived in cities at the beginning of the twentieth century, at the end of this century, the world's urban population reached more than twenty times to three billion people in all over the world. This means that at the end of the twentieth century, for the first time, more than half the world's population live in urban areas (Arjmand Niaya , 1999) .The urbanization process is observed with not very large changes in other countries, especially in developing countries. Since developing countries has reached to the current level of urbanization in the short time, nearly there is a half of peak time of urbanization in developed country. Looking at the changes in population and urbanization of Iran , like other developing countries, can be found out that urbanization has increasingly developed longer with population growth over the past 50 years, so that the urbanization growth in the country has been 3 times more than the population growth and the number of metropolitan cities has reached more than ten cities. However, the recent developments would have different effects. While, most of this cities has started to produce goods and therefore municipal waste very fast, because of technological and industrial needs. They have caused changing in the nature and identity of the natural environment and so, there is less attention to new and environmental issues like greenhouse gases, ozone depletion, acid rain, fine pollen dust , aerosol production , sound pollution , etc. Environment has changed into an human nature-oriented in the twenty-first century to see simultaneously the concept of the nature and environment ending in scientific literature in which environment is not considered as an independent part of the nature, but as a slave for humans . Nature for human, not with human is going to be spread in this era, by a common view of the nature and objective separation and consequently the increasing dominance of man over nature which can be a basis for unbalance ecology. Today, air pollution of the sources , pollution of groundwater resources in meeting domestic wastewater and industries , industrial and sound pollution from cars , planes and urban industrial pollution, , uncontrolled exploitation of natural resources and generally, the environmental pollution ,all are the result of urban production which devastates greatly, the environmental sustainability.

A brief geographical features of Ahvaz

Ahvaz Metropolitan city, is the capital of Khuzestan province and is located in 48 degrees and 41 minutes in east longitude and 31 degrees and 19 minutes in north latitude in the central plain of Khuzestan in southwestern Iran, and is the sixth metropolis and the second largest city in marginalized in population. We face significant changes by looking at the population evolution,

from 1268 up to now. According to current documents, the city's population in the year 1268, was 200 people. From the first census in 1335, population of 120,098 people has reached to , about 1200000 people in Ahvaz ,it means the population has become 10 times more than before during the nearly 55 years that has about 4% growth .

Assessment of urban environmental sustainability

The sustainability of the urban environment means that, the capital and natural resources of that city, is protected, or at least remain constant, and it is prevented from environmental degradation and devastation and it is a particular attention to environmental sustainability at the local, national and international level.

Ahvaz city, as one of the largest industrial cities, is exposed to sever pollution due to establishment of large and different industrial units and polluted construction, certain traffic condition, different kinds of industries only with an emphasis on increasing the production and without applying pollution control equipment.

In addition, the pollution has increased in recent years due to the rapid expansion of industrial development and population increase. The most important environmental pollutants are associated with urban sustainability in Ahvaz, are as follows:

Air pollution from vehicle traffic and polluting industry

In evaluating the environmental sustainability of Ahvaz, development is contingent on how is the humans operation in their environment. Polluting industry has a disadvantage effects on the quality of life of Ahvaz residents. Ahvaz is one of the largest industrial poles. locating over 5,000 of industrial and manufacturing units in the city of Ahvaz and the focus of many large industrial plants such as steel and tubing , oil and gas , power generation plants , food processing , metal and non-metal industry in the suburbs and small workshops and micro industries in urban and industrial towns in surrounding had much negative consequences and impact on the urban environment in Ahvaz. Motorized means of transportation is one of the largest sources of air pollution in the city of Ahvaz, traveling hundreds of vehicles (particularly cars are countless technical defects) in the city of Ahvaz increase in particulate matter and lead and metals in the air of the city. Phenomenon of inversion (temperature inversion) and the air stagnation occurs more often, due to the special climate in Ahvaz, and especially in the cold season, as a result of environmental pollution caused by industrial fringe of the city, mainly in the West and South West of the city and in the direction wind toward the of the city. And, it is also caused by vehicle traffic that has resulted in the discharge of environmental pollutants over the city of Ahvaz.

A significant part of air pollution in Ahvaz, is caused by motor vehicles. Leaking fuel from tanks and incomplete combustion of these fuels creates pollutants such as carbon monoxide, hydrocarbons, nitrogen oxides, ozone, lead and other particles suspended in the air and increase the harmful effects of pollutants on human health in cities. Existence of commercial and domestic manufacturing industry in the city is remarkable, besides motor vehicles and emissions from fossil fuel consumption. And, industries such as food (34 units) , Textile and Garment (12), rubber and chemical products (25), wood and paper (5), non-metallic minerals industry (33), steel industry (49 units),construction machinery industries(34 units), and more other industries (Source: Directorate of industries and mines in Khuzestan) in urban and residential areas is the issues, which should be considered.

Urban air pollution from fine dusts

Air pollution from Fine dust is another effective factor in environmental instability in Ahvaz city which has increased the city's environmental instability as a natural disasters in recent years. Also, air pollution level in Ahvaz, has been reported sometimes equal to 30 times more than the permitted level of pollution (air pollution permissible limit is 150 micrograms in each per cubic meter). Ahvaz, based on World Health Organization report, is announced as the most polluted city in the world (World Health Organization).

Effects of wastewater, industry, municipal and hospital waste and waste paper

Municipal, domestic and industrial sewage, and hospital, industrial and municipal waste are the most important sources of water and soil pollution, especially the Karun River in Ahvaz. Much of the industrial and municipal is depleted in Karun River wastewater treatment plant without refining operation, leading to the pollution. A number of factories and municipal wastewater and municipal waste water, mixed with human sewage is depleted in Karun River without refining operation. Number of workshops and industrial centers wastewater in Ahwaz also collected and discharged sporadically in the surrounding lands of the city with low space that is caused the pollution for two important sources of water and soil in urban environment in Ahvaz.

Producing numerous household and hospital waste

Mass production of the garbage in the cities and the collection methods and its components is effective in environmental instability, considering the increase in population of Ahvaz.

The impact of waste and garbage on urban environment depends on such factors such as the amount of waste, waste composition, collection and transportation of refined and its recycling. The amount of waste produced in each city depends on per capita production population and , per capita, itself, is the result of the economic situation and consumption patterns of the people live in the city (Fifth Report on Environment, 1997).

Based on data collected from the municipal waste of Ahvaz, in 2010, daily average of 1,394 tons of waste has been produced in the city where the average per capita daily waste production is 118 kg for each person(Ahvaz Municipal Statistics 2011). However, these waste should be disposed of environment that does not harm the environment. The most common way of waste disposal is waste disposal, incineration of waste and turning it into compost. But, the reality is that the mentioned methods used by each technique and accuracy, would pollute the environment in each way. Hospital waste is produced daily in a significant amount in Ahvaz, which is remarkable, both in terms of volume and in terms of the collection and disposal. Planning and urban management should be considered According to the principles of sustainable urban development, to prevent environmental urban sustainability from threaten and danger (Nild, Kergro, translated by Naghizadeh, 1997).

Conclusion and recommendations

Today's, many problems of environmental constraints is not considered just as a local or national issue but it is problem for the whole world and earth, even it is a problem in small size and scale in each country.

While technology solves many problems, it also creates new problems and uncontrolled population growth and urban expansion, which has doubled the need to expand the use of technology. It also has numerous environmental consequences. According to studies, the following

solution can be suggested on the effects of urban development on environmental instability index and recognition of the environmental pollution caused by the uncontrolled expansion of the urban:

- Locating, setting and transferring multiple large polluting industrial units appropriate with the climate, environment condition to the wind direction to locate industry around the city
- Applying active and applicable pollution control equipment (industry, vehicles, etc.) and forcing the industrial units to use air control devices.
- Planning and managing traffic and commuter transportation vehicles and motor vehicles, expanding the use of fossil energy and producing greenhouse gases.
- Creating and expanding group and public transportation culture in cities and development of culture in not using private cars and announcing one day in a week as a day without a car in the city
- Refining and preventing unrefined wastewater into the river Karun.
- Converting the waste and garbage into an organic compost and optimal use of waste and municipal waste
- Locating correctly the disposal of waste and wastewater
- Creating and developing plant coverage and greenbelt extensively, and especially in the western and south parts that are in the direction of fine dusts and soil contamination and pollution.
- Creating and developing greenbelt per capita within the city, that is effective in addition to create a beautiful space and leisure time for citizens and producing oxygen and moderating the air, and reducing temperature.

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