

# Prioritizing the Sustainable Development Components and its Role in the improvement of Urban Effete Fabrics with group Analytical Hierarchy Process (AHP): A Central Part of Isfahan City Case Study

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**ABSTRACT:** Effete fabrics are the confines of urban realms that are in the city structures in dealing with some negative features. These neighborhoods are suffering from the kinds of shortages and problems such as exterior and physical exhaustions, poor urban infrastructures and services, social felonies and cultural problems and the types of economic problems. Despite all the weaknesses and shortcomings, these fabrics are part of the cities and there are many residents living in. It seems that given the scope and severity of the problems that beset these contexts, the most comprehensive approach adopted for dealing with shortcomings and deficiencies in effete fabrics is a participatory approach with sustainable purposes and development. Isfahan is considered the biggest historical town in Iran that an extensive part of its old context is affected with effeteness. This study aims to identify and ranking the sustainable development components influencing on the economic, social and physical improvements and the condition of access to improve and revive the effete fabrics of Isfahan city using hierarchical analysis method (AHP) and also using Expert Choice software. Although an effete context is an unavoidable result in city environment, these problems can be reduced or resolved with efficient policy. Having been analyzed and ranked the factors using collected comments and Expert Choice, the obtained results indicate that economic factors with 0.131 weights have the most effect on the improvement of effete city fabrics and social factors with 0.208 weights and environmental factors with 0.131 weights are the next priorities.

**Keywords:** Effete context, Sustainable development, Group Analytical Hierarchy Process, Isfahan city

ORIGINAL ARTICLE

## INTRODUCTION

Cities, as living beings, have different components, which each of these components act together as a system, which is in a constant movement and activity looking for a common goal. This common goal is surely conducive to development and achievement. Effeteness is one of the most significant issues related to city environment that is led to its imbalance, incongruence and its impropriety. Effeteness is a factor that helps declining the urban life with the removal of collective memories (Habibi et al, 2002).

Heretofore all branches of human knowledge, each in a way, have been assessed and evaluated the development factor and each has been able to show some parts of realities. Amongst these factors, perhaps the only branch of science that can judge the relationship between human and nature with the concept of development is the science of geography (Rezvani, 2001).

In recent ten years, various concepts have been presented of sustainable development that is mostly comprised of various branches of geography. As among the sustainable urban development, concepts such as green

town, indigenous town, livable town, resort town and environmental town which all of these concepts are indicative of strong geographical concepts. It can be seen that the realm of paradigm of sustainable development is not just limited to protecting natural environment and wildlife. These concepts include urban, rural, energy, social justice and equitable distribution of wealth, people's participation in decision-making and planning (Shokoi, 2005). Historic and traditional fabrics of towns can be considered the justification of past glories, reviving national and popular identity, protection from non-repetition honors, etc. which are changed into effete locations that reduced social life, inappropriateness of accessible network, shortage or lack of urban facilities and equipment, etc. (Esmaelzadeh, 2006). An old town is not only a physical issue, but also includes cultural-social and economic issues. If old town fabrics is to be considered, it is committed an error. The basic nature of old town fabrics is coordinated, continuous, uninterrupted and seamless formulation throughout history, just the opposite of what we face with today (Tavasoli, 1993). The significance of effete fabrics revival and planning central sectors has been probably best expressed by Hiraskar in a

short sentence that planning in the central sectors is much more difficult than stepping man onto the moon (Rahnema, 2009). Effeteness and destruction of urban historical fabrics in Iran during recent decades is in such a wide scale that strongly threatens the security and civic identity of urban areas (Shamaie and Pourahmad, 2005).

In the second half of the twentieth century, environmental issues have a special position in international issues. Talking about the destruction of forests, soil erosion, coastal degradation, global warming of the earth and the emergence of some holes in the ozone layer has a growing importance (Ziari, 2001). Increased social and economic inequalities between different geographical areas are a great challenge that many countries are faced with (Zellner et al, 2008). Most developing countries are not satisfied with the process of the spatial development of their settlements as well as the regional distribution of population and economic activities (Karimi et al, 2003). Such disparities among regions and lack of balanced distribution of resource and facilities causes the sustainable development is being challenged (Epstein, 2001). Because the development in different times and places has not been performed similarly, regional disparities in these countries are any scale is high and special areas have more excellent conditions than other regions (Gharakhlou et al, 2006).

Today, effete town fabrics in most Iran's towns have become one of the major elements. Urban effete fabrics have mainly different problems among which existing the most effete fabrics of the country's towns in the areas with high risk of earthquake and the lack of needed services (infrastructure, educational, health and services, etc. networks) have been considered as the key points. In addition, the low level of financial and economic abilities of the public's in these areas and the non-compliance of these physics with the requirements of today's urban life has added to the problems of these areas. Therefore, one of the most logical and appropriate options is that the formulation and implementation of the pioneer projects are addressed in order to be faced with people through a concrete and practical solution (Ziari, 2001).

In Isfahan and most towns, the historical and old fabrics have been suffering from functional and physical effeteness with the passing of time and lack of proper maintenance and attention, but by reconstruction, modernization and optimization of these fabrics as well as empowerment and development of human indicators in these fabrics not only causes the maintenance and stability of these fabrics, but a social justice can be achieved which is a stable outcome in each town. These study deals with the prioritization of sustainable development components to improve the effete fabrics of Isfahan city using group Analytical Hierarchy Process (AHP) and Expert Choice software.

## REVIEW OF LITERATURE

Shamaie (2001) in his PHD thesis, studied the outcomes resulted from the physical development of Yazd city in an old town fabric and wrote down that one of the main reasons of its lag is little attention from one hand and indiscriminate and disproportionate of development of new areas on the other hand which as a result, created some problems for both central sectors or old fabric and

new sector. Habibi et al (2007) published a book entitled optimization and modernization of old town fabrics that had n study on the significance of old fabrics and the existing problems and difficulties related to in the global and domestic level. Biranvand (2008) studied on his master's thesis on the feasibility of revitalization and organization of the old fabric of Khoramabad with an emphasis on Zeyd Ibn Ali district and concluded that the old fabric of Khoramabad city, in contrast to other old fabrics of Iran's cities, still remained the service, commercial and administrative center of the town. Khaksar (2004) studied in an article entitled economic revitalization and city centers and old fabric the various methods of the revitalization of old town fabrics and concluded that the economic and physical factors should be taken into consideration for the economic revitalization of city centers (Khaksar, 2004). Kouchaki concluded in this thesis entitled the analysis of skeletal-physical structure of Khoramabad town fabric that what caused the effeteness of old fabric have been the environmental factors and development (Kouchaki, 2007). Ziadat (2010) in his thesis entitled the analysis of ranking of the factors of creating old town fabrics (case study: Isfahan city), finally concluded that identifying and ranking of the indicators of old town fabrics can be led to the identification and utilization of the policies effective in the field of resolving or reducing the problems of these fabrics.

## CASE STUDY

Isfahan city have 1300 hectares old and historical town fabrics which include 85 urban areas. The indicators of creating old fabrics in these areas are mostly practical and accessible. According to the Organization of Modernization and Optimization of Isfahan Municipalities and the indicators of identifying the old fabrics, the area of old fabrics approved on Isfahan city areas is as following table 1:

**Table1.** The area of old fabrics approved on Isfahan city

Column	Area of historical and old fabric	Area of non-historical old fabric	Area of the region's fabric
1	194.87	18.21	213.08
2	0	84.24	84.24
3	292.78	6.28	299.06
4	0	107.95	107.95
5	0	66.52	66.52
6	0	116.41	116.41
7	0	179.23	179.23
8	0	202.24	202.24
9	0	221.88	221.88
10	0	220.82	220.82
11	0	89.88	89.88
12	0	106.19	106.19
13	0	72.75	72.75
14	0	76.48	76.48
Sum	487.65	156958	2057.23

Organization of Isfahan Municipality's Renovation and Improvement Isfahan Municipality, 2011

## MATERIAL AND METHODOLOGY

This research aims to prioritize the sustainable development factors along with revitalization of old fabrics of Isfahan city using an Analytical Hierarchy

Process. To do comparisons, the expert opinions on the city council, municipality and Isfahan governor have been used. Having been collected feedback using Expert Choice, the opinions have been analyzed and the studied factors have been ranked.

### Analytical Hierarchy Process (AHP)

In the science of decision making which a strategy is chosen among the current strategies and prioritizing of the strategies, the methods of decision-making with "MADM" multiple indices has been came to the fore in the last few years. Amongst these, Analytical Hierarchy Process (AHP) has been used in the science of management more than other methods. Analytical Hierarchy Process is one of the well-known techniques in multi-purpose decision-making which was first invented by the Iraqi-born Thomas. L. Saati in 1970s. Analytical Hierarchy Process reflects human's natural behaviors and thoughts. In this technique, complex issues have been studied based on their mutual impacts and changes them into a simple form and then resolve them.

Analytical Hierarchy Process is used when the process of decision-making is faced with some competitive options and decision-making criteria. The raised criteria can be qualitative and quantitative. This method of decision-making is based on paired comparisons. Decision-making begins with providing the hierarchical decision tree. Hierarchical decision tree shows the comparison factors and competitive options in evaluating the decisions. Then a series of paired comparisons are done. These comparisons show the weight of each factor along with competitive options that is going to be analyzed in decisions. The logic of Analytical Hierarchy Process somehow integrates the matrices resulted from paired comparisons with each other which an optimal decision will be achieved. Comparisons performed by experts are performed using paired comparison table as follows (Ghodsipour, 2002). Paired comparison table has been shown in table 2.

**Table 2.** Paired Comparisons

Number much	Preferences (Oral Judgment)
1	Equally Preferred
3	Moderately preferred
5	Strongly preferred
7	Very strongly preferred
9	Extremely preferred
8,6,4,2	Preferences between high distances (Interstitial)

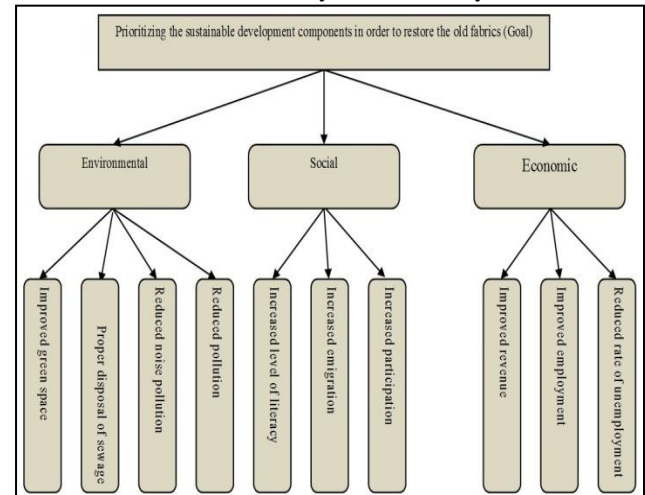
## RESULTS

Components related to urban sustainable development in order to restore the effete town fabrics has been shown in hierarchical tree. The first level is dedicated to research objective (prioritizing the sustainable development in order to restore the old town fabrics), in the second level sustainable development components and the third level the subsidiary criteria based on the main criteria have been shown (Table 3).

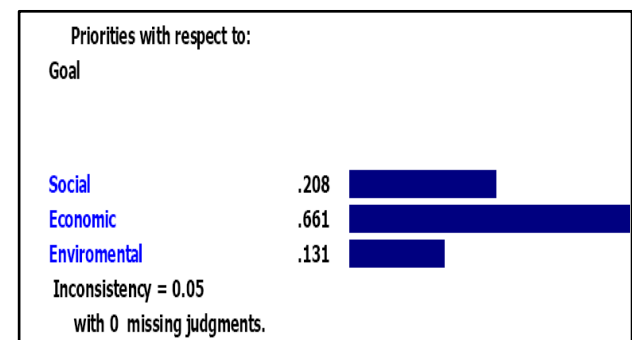
The weights achieved for each main indicator have been shown in Table 4. According to the information obtained, economic factors with 0.661 weights, social factors with 0.208 weights, environmental factors with 0.131 have the highest weights, respectively. Also,

inconsistency rate is 0.05, which is less than 0.10, indicates the consistency between paired comparisons.

**Table 3.** Table of Analytical Hierarchy Process

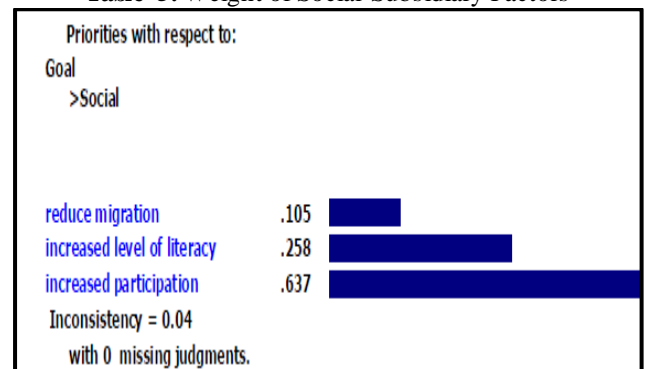


**Table 4.** Weights of Main Criteria



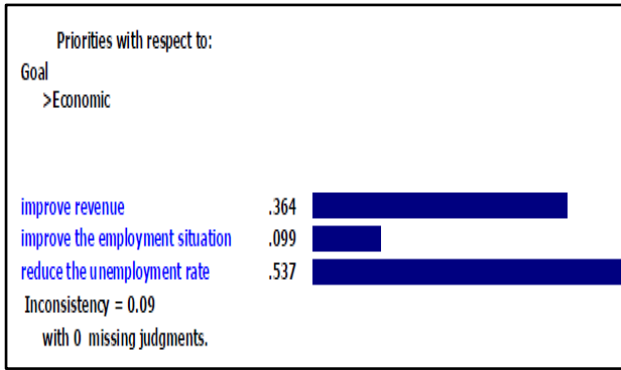
Weights achieved for each subsidiary factor has been shown in table 5. According to the information obtained, increased participation, increased level of literacy and reduced emigration have the highest weights, respectively. In addition, inconsistency rate is 0.04, which is less than 0.10 and indicates the consistency between the paired comparisons.

**Table 5.** Weight of Social Subsidiary Factors



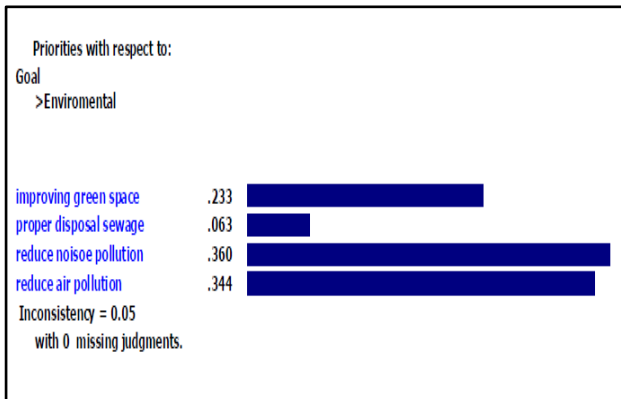
Weights achieved for each subsidiary economic factor has been shown in Table 6. According to the information obtained, reduced rate of unemployment, improved revenue and improved employment have the highest weights, respectively. Inconsistency rate is 0.09 which indicates the consistency between the paired comparisons.

**Table 6.** Weights of subsidiary economic factors



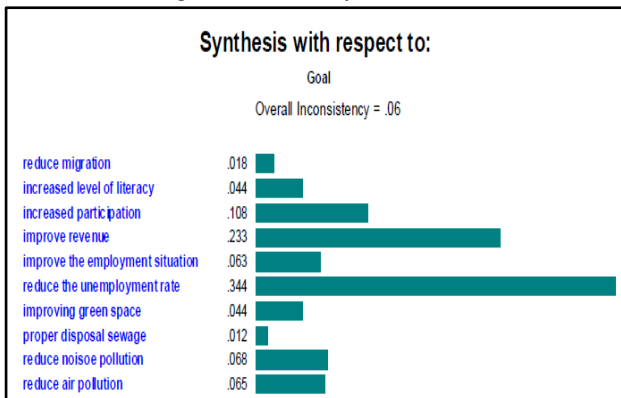
Weights achieved for each subsidiary environmental factor has been shown in Table 7. According to the information obtained, reduced noise pollution, reduced air pollution, improved green space and proper disposal of sewages have the highest rates, respectively. Inconsistency rate is 0.07, which is less than 0.10 and indicates the consistency between paired comparisons.

**Table 7.** Weight of subsidiary environmental factors



Weights of subsidiary indicators of the main criteria (social, economic and environmental factors) have been presented according to improved old fabrics which based on the obtained results, reduced rate of unemployment and improved revenue have the highest weights among other subsidiary indicators. Also, rate of general inconsistency is 0.06 which indicates the consistency between paired comparisons.

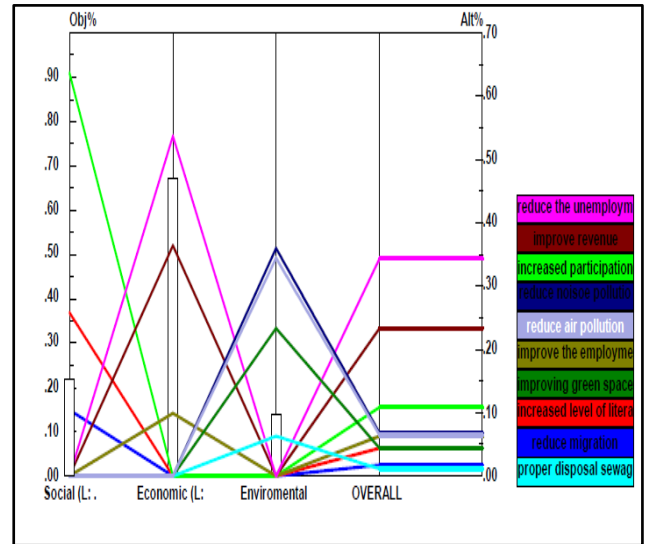
**Table 8.** Weight of subsidiary indicators of the main



Criteria (social, economic, environmental factors) with regard to improved effete fabrics

The results obtained from the expert opinions regarding the indicators of urban sustainable development tested under sensitivity analysis using Expert Choice software have been shown in Table 9.

**Table 9.** Sensitivity Analysis



In table 9, the vertical axis indicates the ultimate weights of criteria, horizontal axis indicates main criteria, the vertical columns within the table indicates the weight of each criteria and break points of the points within the table shows the weights below the criteria. As indicated in the table, economic factors with 0.661 have the highest impact on the improvement of old town fabrics and social factors with 0.208 weight and environmental factors with 0.131 weights have the highest weights.

**CONCLUSION**

The quality of life environment in a healthy and beautiful atmosphere as well as having a secure, desirable and appropriate shelter worthy of human's esteemed status is an inalienable right of every citizen in various towns, including metropolises. Obviously, a dense population concentrated on the settlements deprived of proper quality and problematic urban fabrics will cause a higher vulnerability. Therefore, given the circumstances and capabilities of people living in old settlements in various stages of preparation and the implementation of urban optimization and modernization as well as ordaining policies and laws in which the benefits of people living in the old town fabrics are taken into consideration in a manner than is consistent with the interests of metropolitan cities can ensure the process of achieving to sustainable development of effete town fabrics. Not only does the intervention in effete fabrics meet the social and citizenship needs, it promotes the economic conditions of the settlements and skeletal life quality in such a way that the following results must be achieved:

- An appropriate and practical pattern is developed in order to ensure and increase the certainty of the residents to the nature of works.
- Using the relative benefits of these measures, other projects will be initiated which is led to their safer enforcement.

## REFERENCES

- Any project that is begun with, is led to a result cause incitement, and brings the surrounding fabrics out of recession and depression.
  - The start of change, and consequently increased environmental quality, is led to increased price of land in the scope and a higher economic advantage and accelerate the process of transformations.
- This study investigated the priorities of sustainable development components in improving the old fabrics of Isfahan city.
- The factors to achieve the services and urban green spaces and employment are of the significant components in improving these fabrics. In fact, the significance and value of old fabrics of Isfahan city cause less attention is paid to public and open spaces, particularly urban green spaces. In addition, changes in urban land uses and changes from small residential and business users to big commercial-residential users cause a group of residents lose their jobs and houses or are forced to change their job.
  - The other significant component is resident's satisfaction from the economic and welfare conditions. In fact, the aim of each urban sustainable development is to create a satisfactory environment for the residents of that settlement who are the main owners of these plans.
  - Therefore, this consent occurs when the increased price of land and income (job satisfaction) is led to increased investment and prosperity. Implementing the improvement and modernization plan in the central fabrics of Isfahan city requires the destruction and small residential and business areas that is led to losing job and housing. On the other hand, lack of issuing the construction license and changing the effete ownership extends the effeteness in town fabrics and the land price will be reduced in this area, and this by itself reduces people's participation in implementing the project and selling real state.
  - Another factor considered as an important thing by the residents in the stability of modernization projects is the environmental condition and the pollution resulted from implementing that project. By implementing the improvement plan in one hand, in one hand the residents are faced with the pollutions resulted from destruction and on the other hand with construction. In facts, the residuals remained from demolition and construction has contributed to the contamination of the environment. Therefore, the environmental stability and the contaminations resulted from should be taken into consideration in implementing the urban projects. Another significant factor effective in social stability of urban projects is stability, security and social conditions. In fact, implementing the plan of social cohesion that has been developed during several years will be eliminated. Hence, we are faced with reduced insecurity and expanded delinquencies with the removal of social cohesion and creating social instabilities, though this process can also be reverse.
- Akbari Ziarat, A (2010).The analysis and ranking causes of urban wear (case study: city of Isfahan), MS Thesis, University of Isfahan
  - Biranvand M (2008). Feasibility and organization of the revitalization of old neighborhoods with an emphasis on Khorramabad Zaid bin Ali. MS Thesis, University of Yazd
  - Chan E.H and Yung E. H. K (2004). Is the development control legal framework conducive to a sustainable dense urban development in Hong Kong? *Habitat International*, 28: 409–426.
  - Esmaelzadeh H (2006).Urban management and organization of Urban Effete Fabrics .The first International Congress of Urban Design (Abstracts), publications. Yadavaran. Tehran
  - Epstein T (2001). Urban sustainability: Dilemmas, challenges and paradigms, *Environmental Impact Assessment Review*,Elsevier Science Ltd.
  - Gharakhlou M and Hussein H (2006).the Indicators of Urban Sustainable Development. *Geography and Regional Development Magazine*, No. 8.
  - Ghodsi Pour S.H (2002). discussions in multiple criteria decision making, Amir Kabir University Press, third edition
  - Habibi M & Maghsoudi M (2001). Urban Restoration, University of Tehran. 1st edition.
  - Hiraskar G.K.(2008). An introduction to fundamentals of urban plaing. Translator: Soleimani, M., Ykanyfrd, AR Publication of Jihad ( Tarbiat Moallem University),Tehran,Iran
  - Karimi D and Atri S (2003). Conference on Sustainable Development Strategies in the Executive Sectors of the Country. 1st edition. EPA publications, Tehran.
  - Khaksar A (2004).Economic Revival of City Centers and Old Fabrics", *Haft Shahr Magazine*, No. 14 & 15.
  - Khaksar A (2006). Iran's Urban Districts. Institute for Humanities and Cultural Studies, Tehran.
  - Mousavi M.N and Hekmat Nia H (2005). Factor Analysis and Combination of Indicators in Determining the Factors Affecting Human Development in Iran's area", *Journal of Geography and Development*, Zahedan 6:52-68
  - Organization of Isfahan Municipality's Renovation and Improvement Isfahan Municipality. Isfahan Municipality, 1390
  - Rahnema M.R (2009). The effects of improvement and renovation projects on the community center down the street in Mashhad. *Geography and Development*, 11:120-138
  - Rezvani A (2001).Mutual Urban and Rural Relationship with an Emphasis on Iran. Payame Nour University Press, 4th edition, Tehran
  - Saaty T.L (1980). The analytic hierarchy proces s. New York: McGraw-Hill.
  - Saaty T.L (1996). Decision making with dependence and feedback: The analytic network process. Pittsburgh: RWS Publications.
  - Saaty T.L (1999). Fundamentals of the analytic network process. Japan, Kobe: The International Symposium on the Analytic Hierarchy Process
  - Shamaee A and pourAhmed A. (2005), improvement and modernization of urban geography perspective, Tehran University Press, first edition

- Shamaee A (2001). Effects of physical development and approaches to organizing and to revive the old city of Yazd, and Tehran University thesis
- Shokoi H (2005). Practical Geography and Geographical Schools. 2nd edition, Astan Qods Ravazi Publications, Mashhad.
- Tavasoli M (1993). Old Fabric, an Introduction to the Problem. Seminar Proceedings on Sustaining Life in the Old Fabrics of Iranian Cities.
- Zahedi S and Najafi G (2007). The Expansion of Sustainable Development. Journal of Humanities Teacher", No. 4.
- Zellner. Moira L, Thomas L, Karunanithi. Arunprakash, Garmestani. Ahjond S, (2008), A new framework for urban sustainability assessments: Linking complexity, information and policy [www.iraninstitute.com](http://www.iraninstitute.com)
- Ziari K (2001). Sustainable Development and the Responsibility of Urban Planners in 21st century. Journal of Faculty of Letters and Humanities, University of Tehran.