

The Stability Levels in the Neighborhoods of Tehran

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ABSTRACT

In this paper, sustainability and neighborhood inequities indices are analyzed in neighborhoods of Tehran. The research method is "analytical and descriptive", and it has used quantitative models and computer software. According to the researches, the Shahrak-e-Gharb has been recognized as the most sustainable, and the Shush as the most unsustainable neighborhoods in Tehran. Generally, among 371 neighborhoods are in Tehran, 4 ones where sustainable, 137 were semi sustainable and 230 were unsustainable. The sustainable neighborhoods in the suburb have been established through fast spreading of urbanization by wealthy residents. In these neighborhoods, it is easy to access to services in different fields, standard housing and living facilities. Whereas, in unsustainable neighborhoods that mostly settled around the old context of the city, the conformity between population growth, service and ecological needs, nonstandard housing, narrow streets, and lack of open areas and landscapes has intensified instabilities. Therefore, in the most neighborhoods of Tehran, achieving a sustainable development is possible only through strategies in conformity with strengths and weaknesses and reinforcement of weak indices. Otherwise, not only neighborhood sustainability returns do not improve, but also would increasingly decrease under pressure.

Key words: social sustainability, cultural sustainability, city, sustainability index, factor analysis model, Tehran.

Introduction

On the perspective of the city sustainable development, it is based on a process through which energy circulation would have maximum efficiency at minimum performance conditions in a city, and the environmental harmful effects may be minimized to the least (Haughton, 1997). In Ecological City Theory, it is insisted on developing a condensed city, cheap housing, social justice fructification, creating the city gardens and economic activities based on ecology. Mental Health Theory accentuates that the citizens' cooperation effects on the shaping of the city, the appropriate access to services and urban sustainability.[7]

Anyway, the city developments and centralizing industrial and economic activities in city centers, highlights the sustainability principles more than before. A brief overview of changes in Tehran shows that excess development of the city along with overflow of immigrants has led to inappropriate demographic/ structural changes. Developing some areas of sparse population in the city and non-use of buildings and spaces within the city has caused

agricultural fields change to residential areas in one hand, and inconsistency of per capita and urban densities. On the other hand, The city population has excessively increased between 1355- 1389 and over 40 years Tehran population has become five times, and its suburb population has become 40 times as much as before due to immigrations. In fact, Tehran that was a traditional city, within less than 50 years has changed to a metropolis. In one side of the coin, you can see welfare changes resulted from development and on the other side its destructive effect because of fast unscheduled development.[5]

Capacity of urban infrastructures has been saturated and even decreased around the neighborhood in the old context and the city center. Worse housing and open area situations lead to decrease in general level of life. Consequently, the rich and cozy classes have formed new neighborhoods in the suburb for improving in their life quality. Neighborhood formation based on social isolation and replacement of immigrants and low-income classes in old neighborhoods has increased disparities between neighborhoods in enjoyment of sustainability index and life public facilities. These

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factors have caused environmental changes and increasing distance from city sustainable development.[3]

This study is divided into eight sections: Section 2 deals literature review. Section 3 presents the sustainable city. Section 4 presents Research methodology, and the remaining sections analyze case studies, the research findings and present the research results and questions for future research.

Literature Review:

Measuring urban sustainability is a multi-dimensional issue, while urban quality and patterns provide useful information on the state of urban sustainability, urban flows are also crucial to guide sustainable urban planning for improving the understanding of how urban sustainability performance is interacted with its activities and lifestyles (Rees and Wackernagel, 1996; Alberti, 1996). One direction in studying urban flows is to examine urban impact on the environment by analyzing the flows of natural resources that support urban metabolism, among which the widely used is Ecological Footprint (EF).

Following the strong sustainability criterion (Pearce and Atkinson, 1993; Neumayer, 2003) and consumer responsibility principle (Munksgaard and Pedersen, 2001), EF was developed to allow a conservative measurement of human impacts by measuring the biologically productive land and sea areas, which are required to maintain the biotic resource consumption and compensate carbon emissions for a given population (Wackernagel and Rees, 1995). From its inception, EF has been criticized on its theoretical and methodological utilities: (a) specificity on sustainable practices (Costanza, 2000; Rapport, 2000); (b) bio productivity metrics (Lenzen and Murray, 2001; Lenzen et al., 2007a); (c) yield an equivalence factor (van Vuuren and Smeets, 2000; Ferng, 2007; Wiedmann and Lenzen, 2007); (d) spatial boundary setting (van den Bergh and Verbruggen, 1999); (e) hypothetical energy land (Ayres, 2000); (f) greenhouse gas impacts (Fiala, 2008; Walsh et al., 2009); (g) policy relevance (Moffatt, 2000; Opschoor, 2000; van Kooten and Bulte, 2000); (h) indirect land requirements (Bicknell et al., 1998; Ferng, 2001; Lenzen and Murray, 2001); and (i) uncertainty (Beynon and Munday, 2008).

In terms of methodological development, compound-based method annually calculates National Footprint Accounts for world countries, and allows the comparisons of biological resource appropriations in a global context (Monfreda et al., 2004; Kitzes et al., 2008; Ewing et al., 2008). Component-based approach expands EF scope to sub-national entities, which uses a bottom-up framework to analyze EF components associated with resource consumption and waste assimilations

(Simmons et al., 2000; Barrett, 2001). Combining consistent environmental data, the input-output technique is employed to analyze indirect EF embodiments and enhance EF accounting in a comprehensive and robust way (Bicknell et al., 1998; Ferng, 2001, 2002; Lenzen and Murray, 2001; Hubacek and Giljum, 2003; McDonald and Patterson, 2004; Wiedmann et al., 2006; Kratena, 2008). Given widespread applications of multi-region input-output analysis in examining environmental impacts, the multinational input-output frameworks provide an opportunity to improve the comprehensiveness, accuracy and robustness of EF analysis (Wiedmann et al., 2007; Turner et al., 2007; Wiedmann, 2009; Tukker et al., 2009).

Dimensions of the city sustainable development:

Most researches based on the Brant Land report (in which three layers of development such as equity, equality and environmental protection) analyze sustainable development in 3 ecological/environmental, economic and social dimensions. Others, including Zax separately adds spatial and cultural dimensions. Some others, including Geward(1996), Charles(1995), Kumar(1993) consider the institutional sustainability dimension in sustainable development. Non accession to each dimension weakens the sustainability and increases the distance from sustainable development. [1]

1. **Ecological sustainability:** it means conservation of the basic resources (and related kinds) and some levels that don't deprive people of future choices and maintain or enhance ecosystem capacity and resilience. This sustainability dimension is reinforced by resources and energy consumption decrease, decrease in wastages volume and pollution and their recycle and finding appropriate technologies.

2. **Economic Sustainability:** This dimension insists on maintenance or improvement of economic situations. Economic criteria have an inseparable relationship with the process of developing economic strategies. Economic welfare is based on a combination of economical compilations such as employment, unemployment, renting levels, resources rent, and distribution of duration level equity in local and global economics. Better allocation and more efficient management of resources and investments would guarantee this dimension.

3. **Social Sustainability:** Social tensions decrease, organizing method consistent with social conditions, equity among disabled people, women and racial/ ethnic/ religious groups, human rights, environmental instructions and information, health and medication and appropriate refuge for all people,

family and gathering promotion are the basis of this dimension of the city sustainable development.

4. **Cultural Sustainability:** This dimension insists on discovering endogenous new built models and processes, which make some changes in cultural continuity. In this dimension, human consistencies are defined with nature and environment, and are explained individual/ social beliefs and attitudes according to the environment safeguard and guarding the values and habits.

5. **Spatial Sustainability:** In this dimension, rustic- city formation gets equal and distribution of residents and activities based on population decreases in big cities, avoidance of unsustainable ecosystem destruction, non-concentrated industrialization, and biodiversity maintenance in natural preserves would get better.

6. **Institutional Sustainability:** Organizing, regulation approval and making a logical relation between institutions and organizations are the basis of institutional sustainability. This dimension is considered as a prerequisite for previous level dimensions. Sustainability means that along the time, a decrease occurs in institutional order qualities. This point would be related to management abilities and regulations effects.

Research Methodology:

It was decided to adopt case study approach for this paper as there is little existing research on analysis of sustainability levels; It has been based on the descriptive Research. This descriptive type research has been carried out using the questionnaire as the research tool for gathering the required data. Data's gathering involved both reference document and a questionnaire survey. Sampling was simple random sampling and the data gathering instrument was the questionnaire. In November 2009 a request for interviews and questionnaires was sent to a number of people.

According to r hypothesis, that is "there are differences among Tehran neighborhoods regarding succession to sustainability indices". Due to the studied compilations, the main attitude of the research is "descriptive- analytical". Tehran neighborhoods statistical association is based on structural distributions of Housing and Urban Development Organization. The neighborhoods include 28 economic, social, cultural, hygienic, structural and institutional indices. Required information has been gathered from Iran Statistics Center, Housing and Urban Development Organization, Education Department and Welfare Department. Then different indices have been formed using the factor analysis model. After that, the quarters are ranked by human development compound index model. Finally, neighborhood disparities are considered by scattering coefficient model.

Research Indices: For measuring sustainability and development, some economic, social, cultural, hygienic, environmental, skeleton indices are used. These compound indices can illustrate a level of the life quality and tranquility and sustainability and development process based on selected criteria. Selection of these indices is the most important step in city sustainability and development studies. The mentioned indices are as follows:

Building Operating Indices: it is used the Stratographics software and the factor analysis type R method. The results show a decrease of 28 primary indices to 10 superior factors through a spinal method "varimax" in factor analysis. Then "scale difference settlement" is done through standardization. These 10 factors totally make 79.74% of the variance and show that factor analysis and studied variables were satisfactory. Due to unimportance of two final factors, only one factor was used in this research.

From 1330s and thereafter, considerable structural changes have occurred and changed the city space Agency. In 1340s and 1350s, land reforms and growth of capitalist relations lead to rural people immigration to the cities so that Tehran population increased from 62502 in 1355 to 326776 in 1375. Street constructions and creation of new buildings and foreign patterns, which had paved the way for horizontal development of cities in one hand, and population growth, on the other hand, consistently lead to decrease in city infrastructures capacity and life public level. Following that, the rich residents having strong financial abilities, moved from old neighborhoods to new suburb areas and formed new neighborhoods.

In the development process of Tehran according to structural divisions (1385), Housing and Urban Development Organization has 371 neighborhoods. According to studies, Shahrak-e-Gharb from region 2 is recognized as the most sustainable neighborhoods and Shush as the most unsustainable neighborhoods. From totally 371 neighborhoods, Shahrak-e-Gharb, Kamraniyeh- Tarasht, and Tehran pars, which from 8.9% of the neighborhoods, are sustainable neighborhoods. And 230 neighborhoods, which from 62.2% of the whole, are unsustainable neighborhoods of Tehran.

Space distribution of sustainability levels shows that sustainable neighborhoods have been formed in new structure during recent years through fast urbanization development and the city social separation. Due to huge flow of immigration to Tehran during recent decades for employment and better opportunities, the capacity for urban infrastructures has been saturated in most neighborhoods of the city old context. So that housing conditions got worsen and more condensed, open areas and streets got more crowded, and public lives degraded in terms of individual and social welfare. Consequently, the rich educated classes

have formed new neighborhoods in the urban areas to meet their substantial requirements, improve life standards, and to live in quite cozy environments for passing their leisure times.

Of outstanding features of these neighborhoods, we can mention suitable living facilities, convenient access to educational and entertainment services, standard housing with adequate per capita, open areas and passages based on the recent age requirements. Substantial changes in customs and values and traditional original cultures, and high costs of general life have caused the city low income classes not to be able to live in these neighborhoods. Because living in such neighborhoods require vehicles and appropriate living facilities. High cultural levels, high extent of women cooperation in managerial and professional job markets, and high proportions of women in technical and specialized jobs have greatly affected population control and fertility decrease. Whereas, unsustainable neighborhoods have mostly stated in old contexts and around them. Such neighborhood residents are mostly immigrants who sit on the slums of the city. Quantitative number of indices in such neighborhoods indicate unconformity between population increase and service/ecologic requirements, so that residents live there regardless of their capabilities and potentials.

Of outstanding features of these neighborhoods, we can mention high population increase rate, excessive unemployment, false employment, nonstandard housing with inadequate per capita, narrow streets and passages in most old context areas, unconformity between spaces and services, cultural, educational facilities, also between parks and landscapes and population requirements, low wages, corruption and crime.

Spatial ecological analysis of semi sustainable neighborhoods prove that such neighborhoods have two completely separate features. Feature one includes neighborhoods located in the city center. Whose outstanding features are accessibility of commercial, cultural, educational services, high level of the environmental and social pollutions, population increase, and profiting by some savings resulted from scale and gathering to meet substantial requirements? The second feature includes neighborhoods, which are mostly located at the margin and whose residents are middle classes. Factors such as difficult access to commercial, hygienic and medical services, and high costs have been a sustainability gap (1.7) between Tehran neighborhoods. This number indicates the distance and inequity between the most sustainable and the most unsustainable neighborhoods. In Shahrak-e-Gharb (the most sustainable) facilities in succession of indices have been greatly more than the facilities in Shush (the most unsustainable). Whereas, in regional disparity comparisons using scattering coefficient (c v) the resulted the number was 0.8 that

shows a kind of relatively low homogeneity and convergence between the neighborhoods. The main reason for this matter is superiority of some old context neighborhoods and city centers (which have been maximum unassailability) in some serving commercial indices. The highest distribution and dispersion between neighborhoods are in residential indices, landscapes, communication network, unemployment rate, private and public wage earners, supporting load, and durable residential rates. In unsustainable neighborhoods, residential application per- capita is somehow proportionate, but building qualities are low and nonstandard. However, in suburb areas residential application and head-money are high and lead to environment destruction and excess expansion of the city. Landscape and communication network in sustainable neighborhoods and suburb areas are appropriate and in accordance with the recent age requirements. The high rate of the population increase in unsustainable neighborhoods has caused unfavorable economic situation and decrease in job opportunities.

Sustainable Development Strategies in Tehran:

The goal and spatial strategies for city sustainable development is specified based on developmental strengths and weaknesses of the neighborhoods. We tend to decrease some problems existing in each quarter in one hand, and to take some substantial actions towards achieving individual social comfort, improving quality of life and building healthy urban neighborhoods, on the other hand, regarding facilities and community capacity development. In this way, we can form an effective planning to preserve neighborhood populations and increase services of each neighborhood to achieve sustainable development.⁴

A) Goals of achieving sustainable development: towards Tehran sustainable development:

1. Services appropriate distribution in educational, cultural, medical, commercial areas throughout the neighborhoods.
2. Appropriate distribution of living spaces and their different uses properly using urban lands.
3. Preserving Quarter population through improvement of services and creating a safe environment with different operations.
4. Logical harmony between the city physical development and economic social improvements.
5. Human-environment relationship through the landscape increase to pass leisure times.

B) Sustainable development strategies: towards Tehran sustainable development:

1. Employment increase and unemployment decrease.
2. Tourism reinforcement in old neighborhood contexts through revival and repair of ancient buildings.

3. Development of facilities and installations whose absence leads to immigration and population displacement from urban unsustainable neighborhoods and excess development of the city, and some problems resulted from costs increase.

4. Allocation of different activities to inner city lands in order to prevent the city from horizontal development.

5. Reinforcement of sustainable indices in unsustainable and semi sustainable neighborhoods of the city.

6. Preventing the land to be transacted in the exchange, especially in the neighborhoods locating in suburb area so that the middle classes and young people could reside there when central parts get saturated.

C) Sustainable development policies:

Sustainable development spatial policies of Tehran in different economic, social, environmental and cultural fields:

1. Cultural fields:

Since many unsustainable neighborhoods have located in the old context of the city, using tourism policies in the form of medium-term and long-term plans can improve economic situations of these neighborhoods.

- Preventing rural-urban migration. Most immigrants reside in these neighborhoods because of low rents and therefore, increase unemployment in such neighborhoods.

- Using income tax policy in providing financial facilities and urban installations and equipments in these neighborhoods against medium-term and long-term plans.

- Most residents of these neighborhoods are construction workers with low income. Insuring the workers by private and semiprivate Manpower Supply Company, residents' income can be increased.

2. Social fields:

- Establishment of hygienic and medical centers in all neighborhoods.

- Traffic decrease in the city center through construction of underpasses and overpasses to reduce environmental pollutions.

- Cultural promotion in terms of how to reduce waste production and how to dispose it.

- Raising residents' awareness about sustainability issues and the way to cooperate in it.

3. Cultural fields:

- Building and renovating schools within the marginal and south neighborhoods.

- Changing dilapidated buildings into city landscapes for passing leisure times.

- Increasing cultural facilities in these neighborhoods, including libraries, cinema, video clubs ...

- Repair and restoration of historic buildings and works.

4. Structural fields:

- Upgrading and renovating the old neighborhood context of Tehran.

- Designing network passages in Tehran south structure according to the present age requirements.

- Implementation of the studies and structural reforms and appropriate set of user needs in the form of medium and long-term plans.

- Preventing neighborhoods to spread towards the mountain, river borders, fields and brick-kilns.

- Creating landscapes and urban green belt.

Conclusion:

Due to increase in Tehran population in recent decades and incidence of environmental wastes, urban infrastructure capacity has been saturated in most old neighborhood contexts and even decreased. Consequently, wealthy and affluent, educated and academic families decided to live in the west and north of the city in some cozy and quiet environments, so that in most neighborhoods of Tehran, sustainability in different economic, social, environmental, structural fields, etc. are questioned. According to studies in 28 indices reduced to 10 factors by Factor Analysis Model, Shahrak-e-Gharb was recognized as the most sustainable area and Shush were recognized as the most unsustainable area. Generally, from 371 neighborhoods 3 ones, including Shahrak-Gharb, Kamraniyeh, Tarasht, and Tehranpars are recognized respectively as sustainable, semi sustainable and unsustainable neighborhoods.

Sustainable neighborhoods and some semi sustainable neighborhoods have been located in the suburb in quiet and cozy environments having suitable living facilities, easy access to educational, cultural and hygienic services, standard housing with appropriate per capita and network passages in compliance with present age needs. Whereas, unsustainable neighborhoods are mostly located in the south old context of the city, and southern and eastern border of the city, whose most residents are slums.

Unconformity between population increase and service-ecological needs, high rate of unemployment, nonstandard housing, narrow streets and passages, lack of educational/entertainment environments and landscapes has led to development in sustainability in such neighborhoods. Although Tehran neighborhood inequities show a kind of relative scaling and convergence between neighborhoods in enjoyment of sustainable development facilities, economic/cultural inequities are so impressive and the indices having access to commercial/medical services and facilities are very scarce. This is a natural issue which has caused conformance between neighborhoods in fusion indices.

Therefore, increasing neighborhoods serving capabilities in settling residents' needs in different

fields as well as harmonizing the city sustainability development in compliance with economic/social/cultural...capabilities is only possible through sustainable development strategies based on neighborhoods strengths and weaknesses and their capabilities in choosing sustainable development indices. Otherwise, it is to be feared that not only neighborhood sustainability returns do not increase, but also the city sustainability would increasingly decrease and get questioned.

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