MANAGEMENT RESEARCH AND PRACTICE
VOLUME 10, ISSUE 1, MARCH 2018

SUSTAINABILITY IN URBAN NEIGHBORHOODS, A COMPARATIVE STUDY

Mehrnnaz MOLAVI
Urban Planning Department, University of Guilan, Iran
mehrnaz.molavi@gmail.com

Mahya Sharif NIA
University of Tehran Campus 2, Alborz, Iran
mahya.cute2009@yahoo.com

Abstract
The article explains the concept of sustainability and investigates its appliance in two neighborhoods of Tehran. Features such as identity, vitality, access, diversity, providing services and security are evaluated in two neighborhoods of Tehran. First one is Narmak which is the product of planning and design of contemporary urban planners (French experts in 1960 decade), and the second is Ghanat Kosar neighborhood which has grown without planning.
Method of research is a statistical analysis of questionnaires based on indicators of sustainability, and field observations are used too. By Cronbach's Alpha the validity and reliability of the measuring instrument (questionnaire) were evaluated. Then for expressing the difference between sustainability of two neighborhoods, Mann-Whitney U test was used. According to the results of this study, Narmak neighborhood can be considered as a more sustainable neighborhood, which is in accordance with the principles and criteria of sustainability. Physical features such as green spaces and squares, desirable urban landscape, beside various activities, lead to vitality and the residents' feeling that they belong to their neighborhood makes Narmak a neighborhood with identity. To reach sustainability measures in the second neighborhood changes should be done. The most important point is that, although the neighborhood of Narmak has sustainability principles, but carrying capacity of neighborhood is close to saturation. Therefore increasing building density and population which is inevitable in Tehran due to its growing rate, would imbalance the quality of life and degree of sustainability in this neighborhood very soon.
Keywords: sustainability, neighborhood, criteria, density.

1. INTRODUCTION

Combining the theories of sustainable development with the ideas of cultural environmentalists' school has led to a new concept entitled sustainable neighborhood development. It aims to promote walkable, livable communities that reduce urban sprawl, decrease automobile dependence, provide housing close to jobs and services, and benefit environmental and public health. One of the main goals of sustainable neighborhood development is to improve spatial structure and strengthen local identity through social icons in line with the use of social capitals. In this study, we seek to achieve the following objectives:

ISSN: 2067 – 2462
www.mrp.ase.ro

- Trying to assess Narmak and Ghanat Kosar neighborhoods addressing principles and criteria needed for neighborhood sustainability. The first is a pre-designed neighborhood and the second is a spontaneously developed one.
- Providing the context for the development of social capital (sense of belonging and neighborhood cohesion) to enhance social and cultural interactions and communications.

Background

The growing number of development plans in 1970, whether intentionally or spontaneously, led to the warnings of environmental, social and economic problems. As a result, new concepts and approaches for the future development proposed, such as "sustainable development", "environmental justice" and recently the "smart growth". Sustainability debates in development practices (sustainable development) are originated in biological and environmental studies, and then gradually were injected into the social, economic and physical issues (Saeidi 1998). In the most development processes in the 1970s and 1980s, conservation of natural resources, was the main debate (Azizi 2006). Since the beginning of the 1990s, the sustainable development, gained an ordered structure and the interplay between the economy, society and environment was considered. "World Commission on Environment and Development (WCED 1987)" (Brandt Commission), defines sustainable development as follows: "Development which meets the present needs without impairing the ability of future generations to meet their own needs" (Papoly Yazdi 2008). Barton believes that sustainable development is focusing the development on people and establishing justice for present and future generations (Barton et al. 2003). Meanwhile Duany has practical advises in designing sustainable neighborhood which provides better access, less congestion, less costs and taxes (Duany et al. 2010).

2. LITERATURE REVIEW

Definitions and Concepts

Sustainable Development: Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Although, apparently, sustainable development is an environmental concept, but it seems that it will be more efficient when the four dimensions of economic, social, environmental and cultural aspects are linked together (Meter 1999).

Sustainable urban development: Urban development should be guided by a sustainable planning and management vision that promotes interconnected green space, a multi-modal transportation system, and mixed-use development (Dunham-Jones & Williamson 2008). Sustainability has permeated the discourses of planning and design too, both in theory and in practice. But some of the theorists believe the precise meaning and implications of sustainable development remain quite elusive for urban designers. In spite of definition of Dunham-Jones and

Williamson, Blowers believes: "While there are everywhere rhetorical genuflections to the idea of sustainable development, there is little clarity of or agreement about what it means in principle, let alone in practice" (Blowers 2000).

Neighborhood (community- quarter)

A neighborhood is a geographically localised community within a larger city, town, suburb or rural area. Neighborhoods are often social communities with considerable face-to-face interaction among members (Dunham-Jones & Williamson, 2008). Neighborhood is a unit defined in terms of space, which make people live near each other for support and security, and to meet needs of each other. Milton Kotler suggests: "The neighborhood is a political settlement of small territory and familiar association, whose absolute property is its capacity for deliberative democracy" (Kotler 1969).

Community Sustainable Development

The concept of a *"*sustainable community*"* does not describe just one type of neighborhood, town, city or region. Activities, that the environment can sustain and that citizens want and can afford may be quite different from community *to* community. For Raco, the sustainable Communities plan, in particular, has had a profound effect on the discourses of spatial planning across the country. He believes that it sets out a vision for new-build settlements in the England (Raco 2007). Additionally, geographer Lily Kong has paired concepts of cultural sustainability and social sustainability alongside environmental sustainability as aspects of sustainable communities. She also stresss the importance of local control of natural resources and a thriving non-profit sector to a sustainable community (Kong 2010).

Criteria of a sustainable neighborhood

Some of the efficient principles in sustainable development of city and neighborhood are: vitality, identity, diversity, legibility and access which will be reviewed later.

3. IDENTITY AND VITALITY

A neighborhood with identity is a neighborhood that is distinct from other places and neighborhoods, and legibility is a feature that helps to build distinction. Among the factors contributing to the vitality of the neighborhood is appropriate public spaces. These spaces with their charm and influence on the individual's mind can provide vitality of neighborhood (Khastoo & Saeidi Rezvani 2010).

Environmental policies have the potential to make significant improvements in the quality of life, health and job prospects of the marginalized, dispossessed and socially excluded people in the society. Even the notion of

ISSN: 2067 – 2462
www.mrp.ase.ro

physical sustainability implies a concern for social equity between generations, a concern that must be logically extended to equity within each generation (Smith et al. 1998).

Vitality of a neighborhood can be seen in the presence of people in its streets and squares, walking, shopping, and talking to each other, in children playing in its parks and in elder people sitting on benches watching the others.

Access

Motion in the neighborhood can include various aspects in its various purposes. The main difference between the movement and access in the neighborhood scale, compared to larger units (cities, districts) is its tangible and direct relationship with the households living. Accesses in a neighborhood are not only devoted to daily traffic, but also are an area with different functions. Paths can also be a space to enjoy the process of moving. For example, urban square can express the quality of the environment, and with its shape, scale and quality of surrounding environment can include the concepts of place-making and sense of place. Many paths in cities of the world have various functions related to social interactions, leisure and retailing as well. (Barton et al. 2003).

Neighborhood density and carrying capacity

The analysis and planning of density in the scale of a neighborhood is considered as one of the substantial elements in the strategies of accomplishing a sustainable neighborhood (Barton et al. 2003, Wheeler 2004). Density, is usually associated with other terms such as population and buildings and is one of the key indicators and determinant concepts. Density is related with economic, social, cultural, environmental, and physical factors, and forms one of the basic issues of policy making, planning and design of development programs.

Carrying capacity among the topics related to the density, has direct effects on the quality of life in the neighborhood scale. In general, the criteria for considering the carrying capacity of the area can be divided into four categories: community development capacity (physical, economic, and infrastructure), the capacity of local access (streets and pedestrian paths network), location characteristics (natural characteristics of the neighborhood, open spaces, beauty and landscape) and capacity of resources (land, water and energy resources, biodiversity, air, noise) (Hanachi 2012).

5. METHOD OF STUDY

Research follows these steps: The questionnaires, field observations, exploratory studies, data analysis, preparing analytical model and conclusions. To develop an analytic model, the statistical analysis method is used and in observation section (survey), indirect method (questionnaires) is used. To prove the hypothesis of this study, after development of the questionnaire using the random sampling, these questionnaires were completed. The size of selected samples for each neighborhood was 56 persons. In this paper, the concepts of neighborhood,

sustainability and its principles and dimensions are defined and described. Then six main variables and fifty-five minor variables based on a Likert scale (from very poor/low to very good/high) are investigated. Six main criteria include the identity and vitality, access, diversity, services and facilities, density and carrying capacity, and safety and security are investigated. Analysis of the questionnaires is conducted in SPSS software environment and by using Cronbach's alpha, the validity and reliability of the measuring instrument or questionnaires are evaluated. Then, to express the difference between sustainability and proving the research hypotheses, the Mann-Whitney U Test is used.

Research Questions

It is undisputed that the role of management of a metropolitan must be converted from working for "the communities" towards working by "the communities". Therefore planners should convert their technical role to facilitator of social learning and empowerment. Regarding these points the questions of research are:

1. Can the new approach of "neighborhood based development" be realized in the planning and urban management of Tehran?
2. How is it possible to achieve the community Development management in Tehran?

Necessity of Research

As urban neighborhoods are large consumers of energy, sustainability can be considered as a main necessity. Insufficient research resources have made the problem bolder. During the past decades Tehran has developed widely and rapidly and has faced many problems. Harmonious development is not possible anymore and other problems such as lack of public participation and transformation of the identity and sense of place are widespread problems that have emerged.

Research Hypothesis

The major hypothesis in this study according to mentioned criteria (such as identity, vitality, carrying capacity and etc.) are these:

- Sustainability of Narmak is different from Ghanat Kosar.
- Narmak is a more sustainable neighborhood than Ghanat Kosar.

In order to achieve the goals of the research, a questionnaire was used to analyze the principles and criteria of sustainability in two neighborhoods of Narmak and Ghanat Kosar. The main subjects of these questions were related to criteria of sustainability which were mentioned before.

Introducing the Narmak neighborhood

Narmak one of the oldest neighborhoods of Tehran, is a neighborhood located in North East of Tehran and has a population of over 62,831 people. It covers an area of 11,713 hectares, and about 13,211 households reside in it.

ISSN: 2067 – 2462
www.mrp.ase.ro

This neighborhood, was built by the French experts in 1952, for middle class families most of them employees. Narmak which is unique in Tehran due to its design, has over 100 green small squares.

Haft Hoz square is the largest of these squares and is a business center of the district. The main street of this neighborhood (Ayat) is a commercial street. But lack of enough space for parking has led to traffic congestion due to park of vehicles in margins of it. Designed sidewalks are of the characteristics of this neighborhood, but they have not facilities for seniors and disabled people (Figure 1).

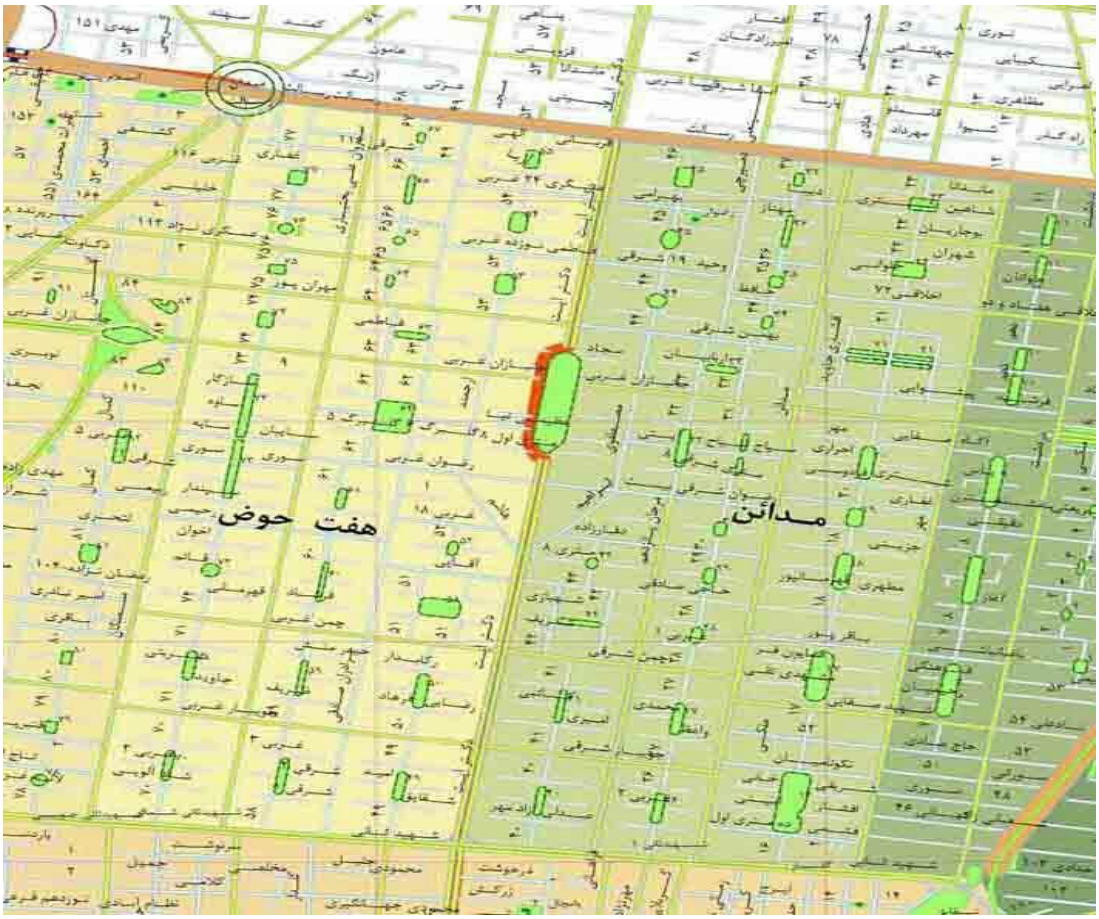

FIGURE 1 – NARMAK PLAN

Introducing the Ghanat Kosar neighborhood

Ghanat Kosar, a neighborhood in east of Tehran, with a population of 19,865 people has the same social class inhabitants, but physically has not designed by urban designers and lacks parks and squares of Narmak (Figure 2).

FIGURE 2- GHANAT KOSAR PLAN

Investigation of sustainability indexes in the Narmak and Ghanat Kosar

In this study, the six indicators of identity and vitality, access, diversity, density and carrying capacity, providing services and security in two neighborhoods, have been studied. For each of the above criteria, the sub-criteria were considered, which were investigated in a questionnaire. The individuals' opinions about the factors influencing sustainability, were questioned.

First, the reliability and validity of the measurement instrument, or questionnaire were evaluated. According to the results of this table, the Cronbach's alpha for each of the six main criteria is greater than 0.8, and this means that questions designed to measure these indicators, have high validity and reliability.

Identity and vitality: About this criterion 21 questions were raised that Cronbach's alpha obtained is 0.835 and this value is greater than 0.7. In other words, questions proposed have high reliability about identity and vitality and provide our demand.

TABLE 1 - RELIABILITY STATISTICS

Cronbach's Alpha	Number of questions
.835	21

ISSN: 2067 – 2462
www.mrp.ase.ro

TABLE 2 - QUESTIONS OF IDENTITY IN QUESTIONNAIRE

Questions	Cronbach's Alpha
How old is your neighborhood?	.825
How much do you like the age of your neighborhood?	.823
How much do you like the urban design of your neighborhood?	.824
How much are you familiar with the people living in your neighborhood?	.835
How satisfied are you with the culture of the people in your neighborhood?	.824
How much mosques help you to get information about your neighborhood?	.834
How much do you have a sense of belonging to your neighborhood as a member of that?	.822
How lively, jolly, and active do you consider your neighborhood?	.817
How effective has been the greenery of your neighborhood in its liveliness?	.823
How attractive and diverse is your neighborhood to you?	.820
How much do you tend to leave your place of living?	.870
How memorable your neighborhood is to you?	.823
How important is it that your friends get informed of the place you are living in?	.821
How much are you proud of living in this place?	.819
How much of day activities in your neighborhood are performed at night as well?	.832
How much do you tend to spend your free time in your own neighborhood?	.818
How effective is the proximity of your place of work in choosing your place of living?	.839
How helpful are the urban signs such as squares, parks, etc. in recognition of the neighborhood ?	.835
How satisfied are you with your neighborhood appearance?	.822
How much do you cooperate in your neighborhood affairs?	.830
How is your neighborhood comparing to the others?	.822

For other criterions, the same method was used, and we reached similar conclusions, which are not mentioned here (due to limitation of pages). However, to prove that there is a difference between the sustainability of two neighborhoods, the Mann-Whitney U Test is used. After the test, the results are shown in following tables.

TABLE 3 - EXPRESSION OF THE QUALITY OF DIFFERENCE BETWEEN TWO NEIGHBORHOODS SUSTAINABILITY

Index	District	Number of Samples	Average rating
Access	Narmak	56	63.55
	Ghanat Kosar	56	49.45
Identity and vitality	Narmak	56	57.97
	Ghanat Kosar	56	55.03
Diversity	Narmak	56	62.48
	Ghanat Kosar	56	50.52
Facilities and Services	Narmak	56	64.01
	Ghanat Kosar	56	48.99
Safety and the Security	Narmak	56	54.34
	Ghanat Kosar	56	57.63
Density and carrying capacity	Narmak	56	62.63
	Ghanat Kosar	56	50.37

TABLE 4 - SIGNIFICANT AND NON-SIGNIFICANT EXPRESSION OF SUSTAINABILITY DIFFERENCE BETWEEN THE TWO NEIGHBORHOODS

Test Statistics a						
	Access	Identity and vitality	Diversity	Facilities and Services	Safety and the Security	Density and carrying capacity
Mann-Whitney U	1173.000	1485.500	1233.000	1147.500	1448.500	1224.500
Wilcoxon W	2769.000	3081.500	2829.000	2743.500	2988.500	2820.500
Z	-2.409	-0.770	-2.056	-2.545	-0.555	-2.139
Asymp.Sig. (2-tailed)	.016	.441	.040	.011	.579	.032

Access

1.According to the test value, Z (z =-2.409 and sig = 0.016), which is significant in the error level smaller than 0.05, it must be said that with 95 percent confidence level, statistically, there is a significant difference between the availability of two neighborhoods, that means the amount of access between the two neighborhoods is different.

2. With respect to the average rating of access, we can infer that, the availability of services and urban centers in Narmak neighborhood (63) is more desirable than neighborhood of Ghanat Kosar (49).

Identity

1.According to the test value, Z (z =-0.770 and sig = 0.441), which is greater than 0.05 in significant level of this test, it must be said that mean two neighborhoods in relation with identity don't have significant difference with each other, and with 95 percent confidence, mean identity of these two neighborhoods are similar to each other.

2.With respect to the average rating of identity, we can infer that, However, there is no significant difference between the identity of the neighborhood, but the identity and vitality in Narmak neighborhood (57) is more desirable than neighborhood of Ghanat Kosar (49).

ISSN: 2067 – 2462
www.mrp.ase.ro

Diversity

1.According to the test value, Z (z =-2.056 and sig = 0.040), which is significant in the error level smaller than 0.05, it must be said that with 95 percent confidence level, statistically, there is a significant difference between the residents variety of activities of two neighborhoods, that means the amount of diversity between the two neighborhoods is different.

2. With respect to the average rating of diversity, we can infer that, characteristics of residents of two neighborhoods, and their activities, physical conditions and related areas, in Narmak neighborhood (62) is more desirable than neighborhood of Ghanat Kosar (50).

Facilities and Services

1.According to the test value, Z (z =-2 and sig = 0.011), which is significant in the error level smaller than 0.05, it must be said that with 95 percent confidence level, statistically, there is a significant difference between the facilities and services of two neighborhoods, that means the amount of services between the two neighborhoods is different.

2. With respect to the average rating of facilities and services, we can infer that its amount in Narmak (64.01) is more desirable than neighborhood of Ghanat Kosar (48).

Security and Safety

1. According to the test value, Z (z =-0.555 and sig = 0.579), which is greater than 0.05 in significant level of this test, it must be said that mean two neighborhoods in relation with security and safety don't have significant difference with each other, and with 95 percent confidence, mean security and safety of these two neighborhoods are similar to each other.

2.With respect to the average rating of security and safety, we can infer that, However, there is no significant difference between mean security and safety in two neighborhoods, but the security and safety in Narmak neighborhood (57) is more desirable than neighborhood of Ghanat Kosar (55.03).

Density and carrying capacity

1. According to the test value, Z (z =-1 and sig = 0), which is significant in the error level smaller than 0.05, it must be said that with 95 percent confidence level, statistically, there is a significant difference between the density and carrying capacity of two neighborhoods, that means the amount of density and carrying capacity between the two neighborhoods is different.

2. With respect to the average rating of density and carrying capacity, we can infer that its amount in Narmak neighborhood (52) is more desirable than neighborhood of Ghanat Kosar (60). In other words, building and demographics capacity in Ghanat Kosar neighborhood is close to saturation, and has created problems such as overcrowding and congestion, traffic and lack of service spaces and so on.

5. CONCLUSIONS

Today, sustainability is one of the key concepts in urban planning. Accordingly, planners are trying to examine the concept of sustainability in different geographical areas in order to offer optimal solutions to improve the sustainability in areas with poor conditions. Meanwhile, comparative study of urban neighborhoods is a good way to measure and evaluate degree of sustainability, and we tried to do this comparison in two neighborhoods of Tehran (Narmak and Ghanat Kosar). In the present study, some principles of the sustainable neighborhood, including the identity and vitality, diversity, access, services, safety, density, and the carrying capacity of the two neighborhoods are studied. Then, the hypotheses are expressed. The first hypothesis assumes that the sustainability of two neighborhoods is different, and in the second hypothesis, it is assumed that the sustainability of the neighborhood of Narmak is more favorable than the Ghanat Kosar. After testing Mann-Whitney U, it has been proven that both of these hypotheses are true. About Ghanat Kosar neighborhood, we can notice problems such as heavy traffic on the Motahari Boulevard, high building density in the neighborhood, poor facilities and utilities, inadequate access, low diversity in terms of type of activities of residents, as important and determining factors in quality of life. According to the results of this study, the neighborhood of Narmak can be considered as a sustainable neighborhood, which is consistent with the principles and criteria of sustainability. A suitable hierarchy of access, proper urban signs, desirable urban landscape, and culture of the residents of this neighborhood, has been introduced it as a neighborhood with identity. Its residents feel that they belong to their neighborhood and have positive feelings toward it. Green spaces, squares, parks, and a variety of activities have led to the vitality of this neighborhood. Important point is that, although the neighborhood of Narmak has sustainability principles, but carrying capacity of neighborhood is close to saturation. So that increasing building density and population, would be a serious problem in near future. Therefore, advertence to the carrying capacity of this neighborhood and trying to enhance it can ensure the sustainability of this neighborhood in future.

REFERENCES

Azizi, M., (2006). Stable residential neighborhoods, case study: Narmak (Haft Hoz and Madaen), *Honarhaye Ziba Quarterly* (27):35- 46.

Barton, H., Grant, M., Guise, R. (2003). *Shaping neighborhoods: A guide for health, sustainability and vitality*, Spon Press, London and New York.

Blowers, A. (2000). Ecological and political modernization: The challenge for planning. *Town Planning Review*, 71(4):371-394.

ISSN: 2067 – 2462
www.mrp.ase.ro

Duany, A., Speck, J. & Lydon, M.(2010). *The smart growth manual*, McGraw Hill, New York.

Dunham-Jones, E. & Williamson, J. (2008) *Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs,* Wiley & Sons.

Habib Pour, K, (2009), *Comprehensive Guide of SPSS application in surveys*, Fifth Edition, Motefak- eran Loyeh Press, Tehran

Hanachi, P. (2012). *The restoration of the historic urban area*, First edition, Tehran University Press, Tehran

Khastoo, M., & Saeidi Rezavani N., (2010*).* Factors affecting the vitality of urban spaces, In Farsi, *Urban Identity Journal*, 4(6):63-74.

Kong, L. (2010). Making Sustainable Creative/Cultural Space in Shanghai and Singapore. *Geographical Review*. **99** (1): 1–22.

Kotler, M. (1969). *Neighborhood Government*: Bobbs-Merrill Company, NY.

Meter, K., (1999). *Neighborhood Sustainability Indicators Guidebook, Urban Ecology Coalition*, Minneapolis, Minnesota.

Papoly Yazdi, MH. (2008). *Theory of Rural Development*, Fourth edition, Samt press, Tehran.

Raco, M. (2007). *Building S ustainable Communities, Spatial Policy-place Imaginations and Labor Mobility in Post-War Britain*. Bristol: Policy Press.

Saeidi, A., (1998). Sustainable development, rural development volatility, *Journal of Housing and Revolution*, (77):47-63.

Smith, M., J. Whitelegg & N. Williams N. (1998). *Greening the built environment*. London: Earthscan.

Wheeler, S. (2004). *Planning for Sustainability: Creating Livable, Equitable and Ecological Communities*. Routledge, London and New York.