

An Analysis of Land Use Instability in Urban Settlements in Southwestern Tehran Metropolis

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Abstract:

Tehran metropolis, due to various factors such as concentration of capital, enjoyment of infrastructures and employment opportunities, has turned to the most important hub for attraction of population in Iran. On the other hand, factors such as implementation of some improper spatial policies in Tehran city and district and increase in land and property prices, low-income immigrants' being pushed to suburban rural settlements and finally unsystematic physical expansion of such settlements all have led to the appearance of urban self-growing settlements around Tehran metropolis. Such local-spatial conditions are more prevalent in urban districts of southweatern Tehran which surround Saveh Road. Appearance of such districts was triggered by development of Islamshahr through spatial-functional annexation of rural settlements and change of agricultural lands and it was aggravated by farther structural expansion and emergence of new cities due to the increase in immigration to this district. Currently, this trend is still in full swing with the decreasing attraction of the original districts of these immigrants.

With view of the role that these suburban districts play in the stability of settlement system of the wider districts and also having in mind the emphasis of other studies done in this regard on the social and cultural aspects of this issue, in the current study, employing statistical data and documentary and field studies, it is tried to yield a spatial analysis of instability of the land use pattern in urban districts around Saveh Road. Analysis of spatial-local distribution of land use indicates severe shortage and scantiness of per capita urban land use and this trend becomes even more severe in the cities which reach out to more suburban areas which are further away from Islamshahr. by considering these districts as an undeniable reality, Therefore, reforming and systematization of the current land use to initiate active and functional involvement of these settlements in stabilizing the zonal system and their residents' enjoyment of better living conditions should be in order. By identifying and analyzing the roots and reasons of centralism in Tehran and reforming the land use systems, a sustainable spatial pattern for other condensed urban settlements in other similar geographical areas in developing countries becomes feasible.

Key Words: instability of land use, physical planning in suburban settlements, Tehran metropolis

Introduction:

Rapid urbanism coupled with economical and industrial development in recent decades has led to enormous expansion in metropolises particularly the ones in developing countries and also it has imposed particular spatial-local developments in their rural suburban settlements; developments which are not much compatible with the local and historical realities of such settlements and which have not been uniform in different countries (Goetz, 2013; Dutta, 2012; Cohen, 2006). In Tehran metropolis, urban districts of Islamshahr, as opposed to the old cities of Iran which were formed in accordance with proper local and geographical conditions and in direct relation with their Surrounding villages, have been formed as a result of various demographic and economical attractions of Tehran. Owing to various factors such as accumulation of economical surplus obtained from selling oil and consequently centralization of capital, infrastructures, and employment opportunities and various urban attractions, Tehran city turned into the biggest hub to attract population in Iran (Tabatabayi, 1988, p. 52), in such a manner that its population grew from 200 thousand people in 1900 to seven million people in 2011 (United Nations, 2012). Manifestation of such centralization was evident in the unprecedented spatial expansion of Tehran metropolis. In the early years, this expansion happened mostly around the center of the city, but spatial limitations brought about by implementation of regulations of the master plan and the increase in land and property prices pushed some of the low-income immigrants of this city towards the suburban rural districts and caused the non-standard expansion of these districts and formation of self-growing cities around this city (Shafi'I Sabet, 2006, p. 189). Southwestern urban

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districts in Tehran are among such districts which appeared with the formation of Islamshahr around Saveh Road through the expansion of the rural nuclei and their focalization with added effect of land use change in the rural agricultural fields. Continuation of immigration to this district and also spatial limitations of Islamshahr led to further and more suburban expansion and birth of new cities (Tehran Urban Master Plan, 1999, p. 41). Currently, 800 thousand people live in these districts. With accepting these districts as an undeniable reality which are caused by the circumstances of the world system which entails general global spatial-functional pattern change in cities (Naryana: 2010, p. 92) and also, with accepting a dependent development pattern and the role of these cities in accommodating population surplus of the metropolises (Habibi, 1992, p. 404), directing attention to the indices of sustainable urban development and fostering the optimal conditions to accommodate the people of such districts seems vital (Rana, 2011, p. 238). In 2000, around 20 percent of the city dwellers of the less developed countries lived in suburban cities (James, 2008, p. 6). In a similar vein, there have been numerous studies carried out on this issue which name this phenomenon as informal settlements, ghetto-dwelling, self-growing settlements etc. Since, such studies in Iran have mainly emphasized the social, cultural and environmental factors (Khatam: 1995, p. 65; Rahnamayi, 1990, p. 41; Piran: 1995, p. 125) and less consideration have been given to the physical dimension, particularly the urban land use and local-spatial distribution, in the current study, urban land use in urban districts of Islamshahr, Nasimshahr, Golestan, Salehabad and Nasirabad has been analyzed using documentary and field studies, also, some solutions have been proposed to systematize them. It is hoped that the findings of the research will help urban and regional policy makers and planners to better understand the

characteristics of land use and to adopt proper measures for the attainment of more sustainable urban conditions.

Methodology:

This study has been conducted through a descriptive and analytical method utilizing documentary and field studies. Demographics of Iranian Statistical Center and land use information of urban institutions (City Council and Housing and Urban Development) and field surveys were collected and were digitized and analyzed using geographic information system (GIS). Different land uses were analyzed quantitatively and qualitatively to draw a comparison between per capita use and the standard per capita use proposed by the Department of Housing and Urban Development; additionally, the spatial features of the land uses were investigated in terms of their compatibility with each other.

basic features of the study area:

The studied area is located in South West Tehran including the service areas of urban districts of Islamshahr, Nasimshahr, Golestan, Salehabad and Nasirabad. According to Table 1, which shows the demographic changes in urban settlements in the area in recent decades, Islamshahr, as the largest district in this area, had some rural settlements close to each other before 1966. The population of this settlement was 1006 people in 1996; but its population, with an increase in rural-urban immigrations and a general tendency for immigration to Tehran and its suburban cities, drastically increased. Initially, this increase had a 47.9 % annual growth rate in 1966-1967, but this then decreased to an annual growth of 3% in 1996-2006 making the population reach 357,389 people in 2006.

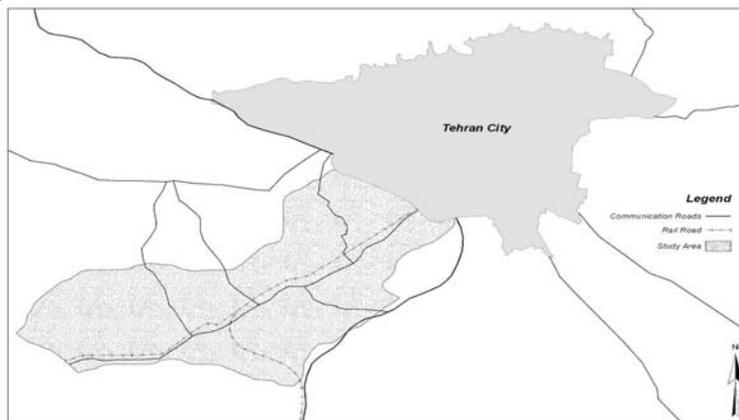


Figure 1: Tehran City, Communication System and the Location of the Study Area.

A dramatic increase in population growth rate occurred in other urban settlements as well. However, this increase did not occur at the same time. About a decade after Islamshahr's population increase, a strong population

growth in cities Nasimshahr and Golestan is noticeable and until 2006 the average annual growth had been high in the two settlements. Akbarabad, which in the early years after the revolution emerged around the lands

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between Vajhabad and Kalame, at first gradually and then rapidly grew in population, reaching from a population of less than 100 people in 1986 to 14,000 in 1976 and then to 85000 people in 1996. It was renamed in 1999 to Nasimshahr and in addition to Ismailabad village, Vajhabad and villages Hessarak, Hamedanak, Kheirabad and Saeedabad were added to the area and its population rose to 150,000 people. Soltanabad's rapid growth was almost concurrent with Akbarabad's. Its growth centered around a namesake village, beginning along Saveh road and then quickly spreading on its bordering farm lands.

Soltanabad, which has reached from 778 people in 1976 to 8,500 in 1986, continued its population growth more quickly and in 1996 reached about 85,000 people. With the annexation of Golestan, Sabzdasht, Riye, Kalame,

Ghalemir, Meimoonabad and the expansion of the settlements on surrounding lands, its population has currently reached about 189,000 people. In the next stage, growth in surrounding settlements, i.e. Salehabad and Nasirabad, has been high and still due to the lower cost of land and housing and poor urban development regulations population growth is high in these areas. Spatial pattern of the settlement system has hierarchically been influenced by the distance from Tehran metropolis and then the arterial Saveh Road in the region. This system of spatial establishment initially begins with Islamshahr, the nearest settlement to Tehran city, and continues along Saveh Road and then further away from Tehran to the cities of Akbarabad and Nasimshahr and eventually to more suburban settlements like Salehabad and Nasirabad.

Table 1: Population change in urban settlements within the study area

City Year	Population absolute					Average annual growth				Density (Ha)
	1966	1976	1986	1996	2006	1966-76	1976-86	1986-96	1996-2006	2006
Islamshahr	1006	50292	215129	265450	357389	47.9	15.64	2.12	3.01	128
Nasimshahr	-	202	13750	85124	135846	-	52.5	20	4.8	191.6
Golestan	-	158	10717	87242	231905	-	52.5	23.3	10.3	210
Salehabad	-	-	1321	14952	54228	-	-	27.46	13.75	70
Nasirabad	-	589	1147	9490	23802	-	6.9	23.5	9.6	20

Sources: Selected Demographic Studies of Tehran city, 2003, Iran's Centre for Research and Studies of Urban Development and Architecture.

Detailed Results of Iranian Statistical Center's Population and Housing National Census, 2006.

Results:

Results of spatial analysis of the study area consistently shows that in Islamshahr, residential land use has been, as the most fundamental factor in occupying lands. In terms of level, this type of land use covers an area of over 1132.27 hectares comprising 41.48 percent of the total urban space. This area consists mainly of small residential housing units; flowingly, 10.8 percent of the residential units have an area of less than 50 square meters, 51.8 percent an area less than 75 square meters, 64.3 percent an area less than 80 square meters, and 86.9 percent an area less than 100 square meters. By comparison, 61.42 percent of the residential units in Iran's cities are less than 100 meters in area and this number in urban areas of Tehran province equals to 57.2 percent. As it can be seen, residential units in Islamshahr are smaller in comparison with the country and the urban areas of Tehran province. Based on the proposed standards, 40 to 50 percent of the city's space should be allocated to residential land use with a 40 to 50 square meters per capita space (Hosseini,

1992, p. 42); however, this per capita space has fallen to 31.7 square meters because of the smallness of residential units.

The case of area of residential units in other urban areas is more serious. 88.8 percent of residential units in Nasimshahr and 90.8 percent in Golestan and 93.6 percent in Nasirabad have an area less than 100 meters and their per capita residential area is respectively 18.6, 18 and 14.8 meters (Table 2). In this region, the area of a sizeable proportion of the residences is less than 50 square meters. Flowingly, in Nasimshahr, 32.6 percent and in Golestan 35 percent and in Salehabad about 37 percent of the residences have an area less than 50 square meters. Analysis of the above data suggests that the more we move towards the surrounding cities, the smaller per capita of residential land and the poorer immigrants. This condition is better to be analyzable through the investigation of the immigration trends in the region in the last few decades.

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Traffic factor, in terms of level, has second highest level after residential land use in Islamshahr. This land use, with an area of 730.38 hectares, has occupied 27.8 percent of the city's space which is equivalent to a per capita of 20.44 square meters. In Islamshahr, due to the proximity to Tehran, as the hub of industrial activity and an

important center for consumption of goods, and due to being located in areas which surround Tehran-Saveh road and Tehran-Qom railroad, compared to other cities and other urban land uses, a considerable amount of lands has been allotted to transportation facilities and warehouses.

Table 2: Per Capita Land in Urban Settlements Islamshahr Area Based on 1385 Population

Per Capita Land Use	Islamshahr	Golestan	Nasimshahr	Salehabad	Nasirabad
Residential	31.68	17.95	18.6	25.83	14.78
Educational	2.17	0.67	0.94	0.81	0.44
Healthcare	0.34	0.12	0.1	0.05	0.002
Religious	0.36	0.12	.035	0.1	0.23
Cultural	0.05	0.06	0.06	0.02	2.65
Sports	0.57	0.21	0.54	0.04	3.62
Green Fields and Recreational	4.7	0.89	0.53	0.24	7.83
Urban Facilities and Equipments	0.8	0.23	0.35	0.17	0.13
Transport and Communications	20.44	9.12	11.95	10.3	33.88
Military	0.44	0.06	0.004	0.016	0.04
Industrial	0.85	4.25	0.043	1.08	30.2
Agricultural	4.17	0.94	7.9	66.52	55.91
Vacant Land	5.91	9.29	6.38	43.7	81.70
Business and Administration	2.71	1.93	2.19	1.5	1.56

Source: Municipality and the Housing and Urban Development Organization of Islamshahr, Golestan, Nasimshahr, Salehabad and Nasirabad

These warehouses are nearly 181 hectares vast and have occupied about 6.7 percent of the city's space. In recent years, these types of land uses have occupied fewer lands due to immigration and expansion of residential land use. In 1986, about 13 percent of the city's space was occupied by them. Transport and communications land uses have occupied 19.2 percent of city's space with a 9.1 square meters per capita in Golestan, 23.4% in Nasimshahr with an 11.9 square meters per capita and 6.68 percent in Salehabad with a 10.3 square meters per capita. The standard per capita in this type of land use is 20 to 25 square meters (Pour-Mohammadi, 2008, p. 44) and it is mainly devoted to communication roads, but in

this area a large portion has been taken away by warehouses and the traffic network is not in proportion to settlement centers and need to be expanded. Additionally, increasing the number of stories of renovated buildings, being a result of the increase in land price, without increasing the width of roads has caused numerous traffic problems for a motor vehicles and continuation of this will cause other difficulties in the near future. In Islamshahr, due to lack of interdependence between urban centers and their direct connection to Tehran, there is no road besides Saveh road to secondarily connect the centers and access roads to Saveh Road and to Tehran are mainly perpendicular to Saveh Road (Figure 2).

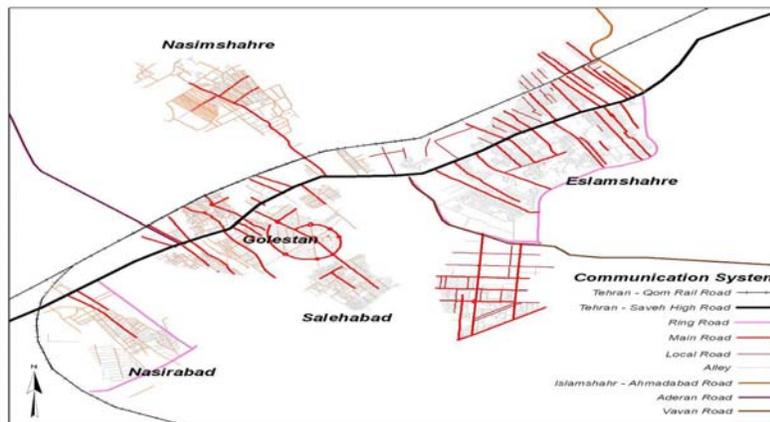


Figure 2: The Condition of the Access Network in Local-Spatial Linking of the Urban Settlements in the South West of Tehran

Land use for industrial activities in Islamshahr, Nasimshahr, Golestan, Salehabad, Nasimshahr is respectively 30.41, 0.4, 98.49, 5.84 and 151.1 hectares (table 2). As is evident from above data, in cities that are closer to the Saveh Road more space is dedicated to industrial use, and also the further cities are from the center, the more such land use, as can be seen in the case of Islamshahr and Nasirabad. Except Nasirabad which has an industrial town, the per capita of this type of land use is less than the national standard of 30 to 40 square meters per person (Shi'a, 2007, p. 163 and Livarjani, 1999, p. 106). Industrial land use in Islamshahr consists mainly of workshop and repair industrial applications, which chiefly fulfills Tehran's needs.

In Islamshahr, per capita educational land use is not much lower than the national standard of 3 to 5 meters due to existence of Azad and Payame-Noor universities per capita standard is in other cities in the area, however, in other cities of this region, the condition is not very satisfactory and the per capita is much less than standard. Per capita for healthcare land use in all lower urban areas and in cities Salehabad and Nasirabad is much below the standard. This per capita in the city of Nasirabad is 0.002 square meter per person, whereas the proposed standard is from 0.75 to 1.5 square meters per person. Urban facilities and equipments and other cultural, sporting, recreational, commercial and administration land uses in urban areas have a poor condition and are far from national standards. Thus, with the increase in distance between the center of the region and suburban cities, the condition becomes more serious in terms of per capita urban land use.

As to commercial land uses, there has not been any chief business center formed because of the uneven and sparse

growth of urban centers in the inner space of these cities. In different parts of the city, small commercial land uses have been scattered in all main and side streets and in intersections and urban squares in a linear form within neighborhoods to meet the everyday needs of citizens. In these cities, the population density and distribution of commercial centers depends on the population of neighborhoods and adjacency to the Saveh Road. Spatial distribution of the warehouses and cold storages, which is affected by the railway station and Saveh Road, is mostly concentrated in the North West and West of the city of Islamshahr, along railway station and Saveh Road to the bed of Karaj River and the surrounding neighborhood of Salour. Existence of multiple manufacturing sites around Saveh Road the fact that the cities in the region are access cities have made a part of various guild activities be devoted to small and large repair businesses which are scattered on both sides of Saveh Road and within other business units in a linear way.

In addition to severe spatial shortage of health care, sports and recreation and administration uses, distribution of the uses has not been done in a proper manner and the land uses lack a functional hierarchy or have a defective functional hierarchy in the region and settlements. Many urban areas lack some types of land uses and in some residential areas, because of the location and proximity to Saveh Road, there is a congestion of land uses. Due to the large number of industry-focused workshops along Saveh Road in the West and the East of Islamshahr within the city limits of Golestan to Nasirabad, various environmental problems such as noise, air and soil pollution have been caused in the vicinity of residential and commercial units.

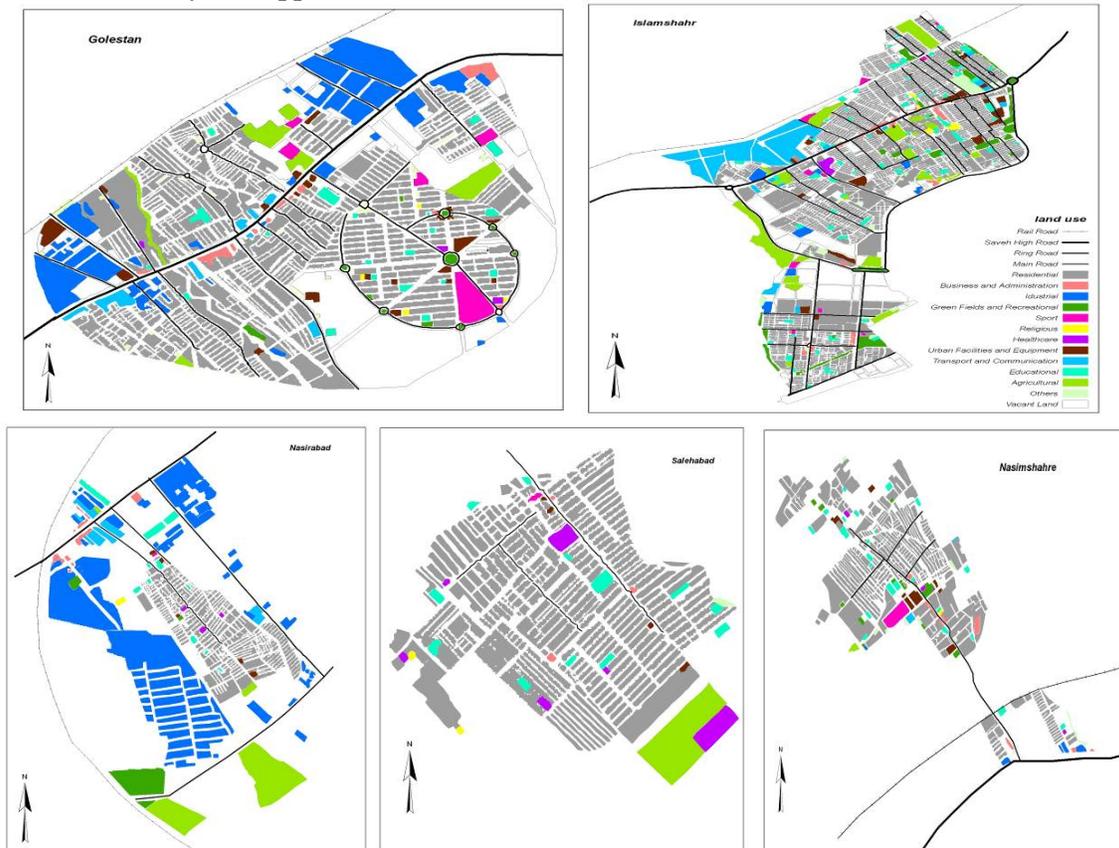


Figure 3: Land Use in Urban Settlements of Islamshahr, Golestan, Nasimshahr, Salehabad, and Nasirabad

Discussion and Conclusion:

In recent years, in Iran's major cities especially Tehran metropolis, there has been a new and unprecedented phenomenon, which has been formed and expanded in strong and continuous connection with the capital metropolis but through some stages of growth and in parallel to establishment of the needed services and activities, attain some self-reliance and relative autonomy shares some tasks with the capital metropolis and attracts some of the suburban references. Nevertheless, such settlements, even in their final stages of development, suffer from a variety of social and physical abnormalities and have been confronted with numerous theoretical challenges (Sheikh, 2008, p. 96). Previous theoretical approaches have perceived suburban and marginal settlements to be equal to poverty, inequality and various social and personal problems and have diminished the role of urban planning and development in confrontation with these centers to a general surgeon to separate them from the body of the city. The measures to clear and demolish slums and fringes have been successful (Mellor: 1977, 19). However, recent theoretical approaches and the strategies to empower people and help residents to improve their residential conditions have been put on the agenda (Gillbert and et al: 1991, 76; Perlman: 1989, 40;

Alsyyad: 1993, 33), because of the following reasons: 1. the properties of settlements in the country have been different from many third world countries due to cultural and economic differences resulting from oil revenue 2. positive functions and the important role of these settlements in accommodating low-income groups 3. spatial partnership with Tehran reduces potential injuries and damages to the capital metropolis (Haughwout, 2009; Khratzebardast, 2000). Accepting these settlements as an undeniable reality, we should pay attention to and expand the solutions which are found from residents' own life and environment without neglecting the social and economic foundations which are involved in the formation and development of these settlements. Inattention to the roots of this phenomenon results in multiplication and accumulation of these settlements in a particular place in the country and will disrupt its spatial balance. Within the scope of the current study, among possible solutions to optimize settlement and living conditions in these cities are: land use management, improving land uses, solving the existing deficiencies and incompatibilities, and reduction environmental problems guided through physical planning. Moreover, among approaches to make these settlements more harmonious is the introduction and construction of educational uses,

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especially higher education, healthcare and recreational uses especially in the cities of Salehabad, Nasairabad, Nsimshah and Golestan and proper distribution of the uses for all urban areas and construction of a functional hierarchy of uses throughout the district and inside the settlements. Land use reform in the region changes daily direct trips from the rural settlements to Tehran and much of the needs of people will be satisfied within region and dependence on the metropolitan area will be reduced. In current conditions, urban and rural settlements in the region are linked to Tehran directly via Saveh Road and there is not a proper link between these settlements. Traffic factor, through adjusting the communicative potential between various activities on the ground, reduces inequalities caused by spatial separation and it is the most powerful tool for forming urban environment and it shapes and leads pattern of activity in city (Chi, 2011; Rezazadeh, 2001) Therefore, reforming and systematization of this land use seems vital. Another important priority is to promote the natural environment which is to some extent achievable through organizing the industries, especially obtrusive and workshop industries and transferring them to industrial and workshop towns. Although, land use reform and efforts to enforce urban development regulations will improve the conditions for residents in these areas, inattention to the primary reasons, which contribute to persistent concentration of population in Tehran, will result in transference of the problems of this city to the outskirts and will regenerate new settlements with problems.

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