

Investigation of Population Establishment Pattern in the Residential Centers of Tehran Metropolitan Area in Relation to the Role of Urban-Regional Management and Planning System (1966-2011)

Manijeh Lalepour

Assistant Professor, Department of Geography and Urban Planning, University of Maragheh, Maragheh, Iran

*Corresponding author's E-mail: M.lalepour@gmail.com

ABSTRACT: Current study has analyzed the trend of population establishment in residential centers of Tehran metropolitan area between 1986-2011 in relation to the role of formal management and planning system of the country. Hence, the trend of spatial establishment of population in the region has been considered through population absorption pattern of urban and rural settlements of the region and new towns position. The research method is descriptive-analytical. Results show that the structure of management and planning of Tehran metropolitan area in the organization of region's population establishment hasn't solidarity and coordination. Population settlement plans in Tehran metropolitan area which has been implemented in the framework of new towns plan has acted in an abstract space without paying attention to policy making and integrated planning for development of other physical elements such as industrial activity centers, communication network and public services and utilities of metropolitan area has acted. This matter has caused that regardless of considerable capacity making in planned new towns, these centers don't play important role in organization of population establishment in the region. Absorption of population out of new towns' land has been more than these planned centers. This matter has resulted in irregular development of urban settlements network of Tehran metropolitan area and emergence of environmental problems in the region.

Keywords: Management and Planning System, Residential Centers, New Towns, Spatial Organization of Population, Metropolitan Area, Tehran.

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INTRODUCTION

Metropolises and metropolitan areas in new world have long background. Since their formation until now, their management procedure in urban studies has been discussed. So that, nowadays in developed countries and most of developing countries metropolitan areas such as other residential centers have defined and formal geographic and management systems. The task of these management institutes is compilation of metropolitan area's integrated development policy and creation of cooperation between policies, plans and actions of management institute involved in development of metropolitan areas. In Iran in spite of long record in urbanization and existence of large cities from past, metropolitan areas and their management is a new matter and considerable actions hasn't done in this regard. During some decades which pass from these regions formation, management and planning of their physical-spatial transitions has been done with traditional and common planning method. In fact administrative executive system of the country in current conditions hasn't defined and specific systems of metropolitan areas management. In spite of this matter, from 1981s, the plan of construction of new towns around large and medium cities has been proposed. In 1985, the plan of construction of 5 new towns in different points of Tehran was approved and since 1992, their operation was begun. Consideration of literature shows that different researches has assessed

the success of new towns in achievement of population absorption goals and the trend of physical transition of current cities around metropolises in the view of plans content weakness. But current study, has investigated the trend of residential spaces and industrial activities transitions of the Tehran metropolitan area in the view of management. Now by spreading these regions, suitable opportunity has been provided that the position of current formal planning and management system of the country in organization of physical elements establishment of the Tehran metropolitan area to be evaluated. Regarding increasing importance of this matter, current study has considered the trend of urban settlements transitions of Tehran metropolitan areas in the view of the position of urban and regional planning and management system.

The main idea of this research is that under the condition of management multiplicity and fragmentation in Tehran metropolitan area and lack of plans and management institute actions' coordinator which are proportion to spatial development requirements, physical-spatial development won't be according to approved plans and projects and metropolitan area will encounter irregular physical development.

The aim of this study is recognition of spatial transition of Tehran metropolitan area's urban settlement and identification of position of formal management and planning system and performed plans in spatial organization of residential centers of Tehran metropolitan area. In this relation, questions are proposed as following:

Has transition and formation of urban settlement of Tehran metropolitan area been according to approved plans? How much have approved plans and projects been successful in organization of urban settlements establishment of the Tehran metropolitan area? In this relation, population and spatial transition of urban settlement in Tehran metropolitan area has been considered. Also, in order to the recognition of formal management and planning system of the region, the role of new towns in population absorption has been investigated.

MATERIAL AND METHODS

Current study has been done using descriptive-analytical method. In first step, concepts and theoretical foundations in metropolitan areas formation and their physical-spatial management and planning system using library study has been investigated. In order to answer study questions, through documental study and refer to published figure of statistical center of Iran and related agencies, the trend of spatial transitions of urban settlements of Tehran metropolitan area has been investigated.

In order to extraction of population and industrial workshops statistics, 1966-2011 statistical yearbooks relating to Tehran and Karaj have been used. In order to presentation of new towns location rather than communication networks in the region, Arc GIS has been used. Finally, with combination and adaptation of theoretical foundations and results, physical transitions features of Tehran metropolitan area and related matters was deduced. In conclusion necessary actions and solutions have been presented in order to modification of region's management and spatial-physical planning system with emphasis on residential centers establishment system of the region.

Theoretical Foundations

The concept and trend of physical- spatial organization of metropolises and metropolitan areas: Phenomenon of metropolis in its common and new concept is the result of industrial and urban revolutions which have emerged physically in late 19th century and early 20th in European societies.

Industry and services are centripetal activities and a city is the result of these processes and population and economic activities density in physical small confines. Quantitative and qualitative intensification of mentioned processes following industrial and urban revolutions provided necessary conditions for formation and growth of large cities and finally metropolises in order to maximum thrift resulted from concentration. But, the law of scale diminishing returns causes conditions that changes centrifugal forces and processes into inherent components of metropolises. So, metropolitanization accompanied by regionalism in spatial planning literature. The result of this accompaniment is seen in the form of metropolitan and metropolitan area in most cases (Athari and Kazemian, 2000).

Following economic, social and environmental problems in metropolises and as a result decrease of life quality in metropolises because of high population and activity density, construction of new towns was selected

with the aim of decentralization from metropolises. In order to achievement of this purpose, forecasts for these cities in given periods mainly in population and employment attraction were done (Garakhlou et al., 2009: 17). New towns pattern as a basis for organization and refinement of large cities has been selected. Nowadays, these cities along with other residential centers have formed world's metropolitan areas.

Related approaches to management system of metropolitan areas: Simultaneous presence of separate realms of local management in metropolitan areas resulted in competition in population and activity attraction in the region level. This matter encounters problem the cooperation between realms of local managements and as a result policymaking and integrated spatial planning of metropolitan area. Practical answer of metropolises to this matter can be accompanied by new organizational arrangements. Coordination is the main axis in dispersed organizational view of metropolitan areas. So, knowing the spatial development challenges of metropolises the fundamental question is how different management institutes functions in institutional fragmentation and continuous spatial interruption can be coordinated.

Two management approaches has been proposed: classic regionalism approach which suggest the solution in creation of new level of metropolitan area government. But because governmental reshuffle strategies and establishment of new form of government is possible hardly; new regionalism approach suggests the idea of metropolitan area governance (Salet et al., 2003). New regionalism in spatial management of metropolitan areas suggests rely on current governmental structures and organization or participation in these familiar institute functions. According to this approach, because metropolitan area is full of different actors of public and private sector in multilayer levels of spatial scale which are active and effective in all urban policymaking levels, the main challenge is to find useful point for organization of "relation and connection" among different function areas. William Salet (2003) names this challenge as 'metropolitan coordination such as the challenge of organizing connectivity'.

Coordination in mentioned regional and spatial-functional levels in metropolitan areas will be guarantee on systematic and coordinated organization of region's physical elements (residential, activity, services centers and communication network, etc.). Achievement of this coordination needs formation of integrated organizational and institutional structures. The structure of dispersive governance (existence of separate and different administrative-political realms and institutes in metropolitan area) hasn't necessary capabilities in order to the selection of spatial unit policy of metropolis and adjustment of function confines with organizational one is the condition of achievement of spatial coordinated policy and plan for whole metropolitan area.

Recognition of the Tehran Metropolitan Area

The emergence of the Tehran metropolitan area: One of the obvious indices of metropolitan development is decrease of population growth and its increase in surrounding points. This phenomenon emerged obviously in 1981s in Tehran and its surrounding.

Comparison of annual population growth rate in Tehran and its urban and rural points during passed 4, 5 decades (1966-2011) indicates significant transition which is indicative of Tehran and its surrounding into a metropolitan area. According to Table 1 and 2, proportion of Tehran and its metropolitan area (Tehran province) of population and industrial workshops of country has increased during past decades. Tehran's proportion

compared with province has decreased. In other word, proportion of population and activity of Tehran's surrounding has increased. This matter is reflecting geographic dimension of population transition and activity and spatial facts of the Tehran metropolitan area. Figure 1 shows the Tehran metropolitan area's confines and counties.

Table 1. Number and Average of annual growth of industrial workshops in the Tehran metropolitan area between 1976-2002

	1976	1986	Annual average growth (1976-1986)	1994	Annual average growth (1986-1994)	2002	Annual average growth (1994-2002)
Tehran County	41919	67640	4.9	373680	23.8	456763	2
Tehran Province	45871	82189	6.1	504939	25.5	675101	2.95

Table 2. The evolution of the proportion of Tehran population to the country and metropolitan area between 1956-2006¹

Year	Total population of country	Population of Tehran metropolitan area		Population of Tehran	The proportion of the region's population to that of the country	The proportion of Tehran's population to that of the country	The proportion of Tehran's population to that of the region
		Population of whole metropolitan area	Excluding Tehran				
1956	18954700	1990300	478000	1512000	10.5	8.0	76
1966	25788722	3456000	756000	2700000	13.4	10.5	78
1976	33708744	5332000	832000	4500000	15.8	13.4	85
1986	49445010	8108000	2108000	6000000	16.4	12.1	74
1996	60055488	10344000	3594000	6750000	17.2	11.2	65.3
2006	70495782	13422000	5710770	7711230	19.04	10.94	57.5
2011	75149669	14595904	6441853	8154051	19.42	10.85	55.86

¹According to Act of 1995 of government on provision of the plan of Tehran agglomeration, limit of the Tehran metropolitan area includes Tehran and Alborz Provinces except Firoozkooh County.



Figure 1. The limit of the Tehran metropolitan area and counties

Management system of the Tehran metropolitan areas

Population and economic transitions of Tehran metropolitan area is indicative of necessary change in management and spatial planning system of region. In other words, if metropolitan areas management did not change proportion to economic and social changes and transitions, i.e. independent managements of metropolitan areas realm did not move toward integrated management, spatial-physical plans won't have necessary ability to guide and control of physical and spatial transition of metropolitan areas. In this relation, consideration of Tehran metropolitan area's management structure shows that during this period, administrative and political divisions of Tehran has increased (Table 3) of course excluding villages (According to Act of 2005 of parliament, in villages as the last order of political divisions of the country dehyari is responsible for

management of village). The matter is that in spite of increase in the number of realms and management institute, any management institute hasn't been formed in the "realm of the Tehran metropolitan areas".

By increasing administrative and political divisions as local and regional management realms, agencies established in region's cities and counties has increased. Emphasis on this matter is because of this subject that in the management structure of Iran, in addition to city's council and municipality, 25 independent administrative-governmental agencies contribute to the spatial development management cities. Following organizations play role in management and planning of physical-spatial development of the Tehran metropolitan areas:

- Approval of guide plan: The ministry of country
- Approval of master plan: Supreme council of architecture and urban development
- Transfer of land: The ministry of roads and urban developments
- Construction of social housing: The ministry of roads and urban development
- Construction of new towns: New Towns Development Corporation in the ministry of roads and urban development
- Construction of industrial towns: Industrial Towns Corporation in the ministry of industry, mine and trade
- Construction licensing: municipality in cities, dehyariin villages and governors and bakhshdari out of urban privacy (commission on Article 13)
- Urban development plans: The ministry of country
- Commission on Article 5: department of state and municipality

-Construction of electric and water network: The ministry of petroleum
 - Communication networks of inter-cities and city's privacy: Vice chancellery for planning and transport economy in the ministry of roads and urban development
 - Other administrative-executive agencies: This situation is indicative of multiplicity and fragmentation in management of physical-spatial development of Tehran metropolitan area (Lalepour et al, 2012).

Plans of organization of population establishment in the Tehran metropolitan area

Tehran's first master plan (1966) controlled physical transitions of Tehran and hasn't paid attention to the Tehran metropolitan area. Tehran's 1991 organization plan (the second master plan of Tehran) was in relation to organization of physical transitions of Tehran and in relation to metropolitan area has sufficed only for construction of new towns. The plan of Tehran agglomeration (1996) is as the first plan which was prepared in the level of the Tehran metropolitan area realm and following it the plan of urban limits of the Tehran metropolitan area are preparing and approving in recent years. These two plans that had proposed two main preconditions for carrying out the plan based on establishment of integrated management system of the

Tehran metropolitan area and the necessity of solving of informal settlement of low income groups, because of not to solve of these two matters wasn't accomplished. Master and guide plans which have been prepared and performed in urban and rural points did not pay attention to metropolitan area and next transitions and did not have suggestion in this regard. These plans such as common procedure of urban and rural planning in Iran only have controlled physical transitions of their urban and rural points. So only the plan of construction of new towns is that in spite of management dispersion in the Tehran metropolitan area has been accomplished and has provided the opportunity of the assessment of their role in the organization of region's population settlement. Investigation of approved and accomplished plans in order to organization of population settlement in the Tehran metropolitan area shows that this matter has been practical in the framework of construction of new towns. Planning for organization of population settlement in the Tehran metropolitan area after two decades (1966-1986) from Tehran metropolitan area formation and in 1985 with approval of construction of 5 new towns around Tehran and approval of new towns development corporation statutes in order to construction of approved cities was carried out. Population, area and position of new towns around Tehran have been shown in Table 4.

Table 3. The change of management realms of the Tehran metropolitan area between 1966-2011

Management Realms	The institution of regional and local management	1966	1976	1986	1996	2006	2011
County	Governor	5	4	6	9	13	21
Bakhsh	Bakhshdar	13	14	18	21	35	44
Dehestan	Dehdar	33	35	37	63	79	96
City	Mayor	8	17	17	24	51	60
Total Realms	-	59	78	78	117	178	221

Table 4. The characteristic of new towns of the Tehran metropolitan area

The name of new town	Population Capacity (People)	Area (Hectare)	Position
Hashtgerd	500000	4000	65 Km to Tehran, 25 Km to the west of Karaj
Parand	80000	3400	45 Km to the south west of Tehran (RobotKarim Region)
Pardis	150000	3000	35 Km to the east of Tehran, Abali Road
Andisheh	100000	1000	30 Km to the south west of Tehran, south of Karaj, near Shahryar

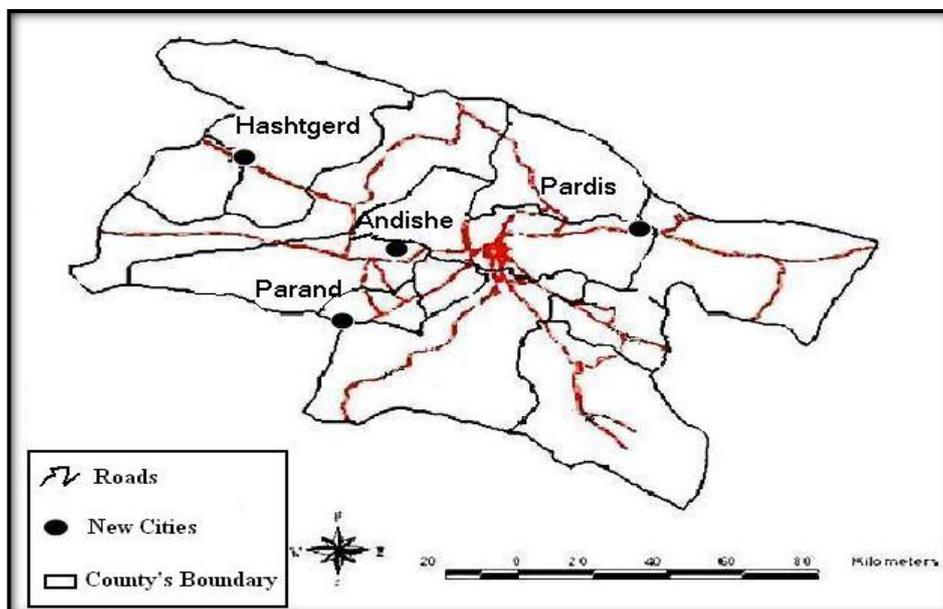


Figure 2. The position of new towns establishment in the Tehran metropolitan area

RESULTS AND DISCUSSION

Population absorption trend of residential centers of the Tehran metropolitan area and the position of new towns

The trend of cities formation in some recent decades in Iran and Tehran province have been accompanied by population increase in rural points and their change into city. So, consideration of this matter along with constructed new towns by government can be descriptive of spatial transition of residential centers of the Tehran metropolitan area. Figures related to the number of urban settlements of region show that cities number has increased from 8 in 1966 to 60 in 2011 (Figure 1). In order to investigation of position of new towns in spatial transition of regions population, trend characteristics, during recent 4 decades, in two periods before and after construction of new towns have been considered. Table 5 shows settlements which had high rate of population growth in the first stage of Tehran metropolitan area formation (1966-1986). In Table 6 settlements which in the second stage- after construction of new towns- had high population absorption has been shown. It is necessary to mention that this Table shows residential centers with high growth rate. Table 7 shows the population absorption situation of region's new.

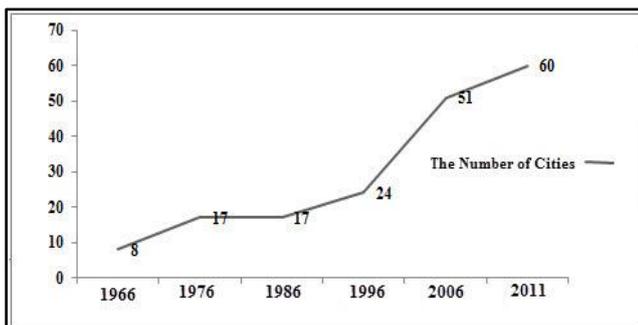


Fig. 3. The trend of urban points increase in the Tehran metropolitan area between 1966-2011

Main points derived from the trend of formation and transitions of urban settlements of Tehran metropolitan area are as following:

1. Investigation of the statistics of population growth rate of residential points of province shows that the villages around Tehran had encountered high population growth. Islamshahr which was a small village in 1966, it has been changed into a city with a population of 390,000. In addition, other important and different cities with population over 100,000 people have been formed around Tehran. Melard with a population of 290,000, Ghods 284,000, Golestan 260,000, Shahryar 250,000, Varamin 219,000, Pakdasht 206,000, Garchak 191,000 and Nasim Shahr 157,000 are populous urban points of region which except Varamin all the others are villages that under the condition of lack of planning rules and because of favorable position in population attraction and high population growth changed into a city.

2. In terms of population absorption features, points which had high population growth in the first stage, their population decreases in the second stage and in turn, their around villages begin high population growth. In other words, in the first step the position of these settlements

rather than Tehran have changed these centers into points which absorb population and in the second stage; these settlements have changed into centers which absorb population in the around small residential centers. So that in the second stage of evolution of Tehran metropolitan area (1986-1996, 1996-2006 and 2011), villages around points which absorb population in first stage such as Akbar Abad, Soltan Abad, Bagher Abad, MeshkinDasht, Nasir Abad, Mohammad Abad and Kamal Abad have experienced high growth rate in this period. During this period, villages and small cities located infertile plain of southern and eastern Tehran and Karaj became larger with high growth and new residential centers have formed in their around in a short period. New figures related to census 2011 shows that now except these regions, settlements such as Saba Shahr in Shahryar county with 21 percent population growth, Pakdasht with 10.3, Baghestan and Sharif Abad with 6.5 percent had the highest population growth rate which except Pakdasht all others are region's villages which because of high population absorption has been changed into city.

3. In relation to the rule of new towns in population attraction, figures are indicative of these points weakness in absorption of overflow population of the region. During the years between 1991-2011, population of Tehran Metropolitan area has reached from 9,221,676 to 14,595,904 which shows 5,372,228 population increase. During these years, new towns of region have attracted region's 303000 overflow population. In other words, they have attracted just 5.6 percent of extra population of Tehran Metropolitan area. Melard with 290,000, Ghods 284,000 and Golestan 260,000 have residents about total population of regions new towns.

4. A glance at statistics of new towns of region in 2011 shows that some new towns have encountered irregular population growth in recent years. Parand new town, between two censuses 2006-2011, had 68.5 percent population growth. In the other new towns, average growth of population has been 1.6 percent. Investigation of this subject shows that high population growth in some of these centers (Parand) has been because of housing mass production by housing and investment cooperative. According to statistics presented by new towns development corporation in Parand new town, about 17,000 units Mehr housing has been located (new towns development corporation, 2013; 1) which completing and transferring these units, 70,000 will added to this town's population. It is forecasted that this town's population be more than its final population.

A glance at the above statistics shows that new towns in two recent decades couldn't make a contribution to providing overflow population with housing and organization of physical development of region at the determined aims level. According to Table 6, except Andisheh new town, other new towns in attraction of forecasted population in expected years haven't been successful. But in recent years following increase in the price of land and housing in Tehran and with investments done by cooperative in new towns, their population have increased. Under these conditions, it is possible that following irregular increase of population; regions' new towns have encountered problem of lack of infrastructure and superstructure installations and problems of servicing to citizens will intensify. On the other hand, defined

population capacity for new towns isn't coordinated with overflow population of the Tehran metropolitan area in recent two decades. If new towns reach to their final forecasted population, only they could cover 23 percent of overflow population of the region. Under these conditions, over flow population of the region not only in new towns but in region's small cities and villages has been settled. So that rapid population transition in these areas has prevented planning. So that these cities either did not have approved urban plan or if they had, a glance at urban plans of some settlements such as Akbar Abad and Soltan Abad shows that population growth of these regions have been more than the forecasts of approved plans. This subject

has caused that we encounter informal settlement and interruption in population distribution and residential centers in the Tehran metropolitan area. The establishment of these regions in agricultural land and around communication axes has resulted in destruction of green fields and orchards and imposition of heavy traffic. In addition, lack of services centers and increasing pressure on residents has resulted in dissatisfaction and social and cultural abnormalities. With unplanned increase of housing units in new towns, without coordinate planning for creation of other services and utilities which are essential for citizens, we will see different problems even in regions planned cities.

Table 5. The settlement which absorb population in the first stage of the Tehran metropolitan area formation (before construction of new towns)

No.	Settlement points	Population Growth Rate				
		First Stage		1986-1996	1996-2006	2006-2011
		1966-1976	1976-1986			
1	Islamshahr	34.5	16	1.15	3	1.7
2	Hasan Abad	7	12.3	6	6.1	6.4
3	Hashtgerd	12	11.4	7.2	3	2.8
4	Nazar Abad	13.7	11.4	4.75	3.5	2
5	GaleeHasankhan (Gods)	12.4	24.6	6.14	5.2	4.3
6	RobatKarim	4.7	12.1	7.4	5.6	4.4
7	Mahdasht	8.6	12.2	5	4	3.6
8	Karaj	13.7	9.6	7.5	3.9	2.06
9	Garchak	22.3	17.4	3.7	2	1.96
10	Pakdasht	8.2	13.5	11.3	9.9	10.3
11	Varamin	7.8	8.1	6.3	9.6	1

Table 6. The settlement which absorb population in the first stage of Tehran metropolitan area formation (after construction of new towns)

Residential Centers	Population Growth Rate			Residential Centers	Population Growth Rate		
	The Second Stage				The Second Stage		
	1986-1996	1996-2006	2006-2011		1986-1996	1996-2006	2006-2011
Shahryar	6	16.8	5.7	MohamadShahr	9.6	18.5	3.9
Melard	19	10	4.9	Garmdareh	-	14.2	0.8
SafaDasht	7.24	8.8	3.9	Sharif Abad	9	8.1	6.8
Soltan Abad	25.6	11.2	2.3	Eshtehard	2.4	5.2	6.3
Bagher Abad	13.6	2.5	2.4	Nasir Abad	-	10.1	2.5
Saleh Abad	-	10.5	3	Akbar Abad	20	4.8	3
MeshkinDasht	8.8	11.4	4.1	Saba Shar	-	-	21
Kamalshahr	9.5	11.5	6.45	Baghestan	-	-	6.5

Table 7. Current and Predicted Population of new towns of the Tehran metropolitan area

New Towns	Hashtgerd	Parand	Pardis	Andisheh	Total
Settled Population until 2006	47320	5900	58000	100000	211220
Predicted population until 2006	83000	35000	90000	95000	303000
Percentage of Population achievement	57	16.8	64	100	60
Settled Population in 2011	52000	80000	63000	108000	303000
Final Predicted Population of City	500000	150000	200000	132000	982000

CONCLUSION

Current study has considered the trend of spatial transition of the Tehran metropolitan area's urban settlements with a glance at the position of new towns. Results review shows that political-administrative realms and involved organizations in the management of spatial-physical development have increased in recent years. This matter will caused dispersion of approaches, policies and physical-spatial plans in physical development of region which its result will be physical-spatial interruption of the Tehran metropolitan area. In this regard results show that the number of population that are settled informally in the region, are more than the population which have been settled in the new towns of region.

Informal development of residential centers and tissues of region shows dispersion of urban development as a result of spread of informal market in villages around cities under lack of integrated management and planning. Concentration and dispersion are a function of factors such as distance from Tehran, communications roads, services and industrial centers and focuses and population centers with high ability of population attraction. All these cases refer to the weakness of management and planning system of the Tehran metropolitan area in spatial organization of population and activity in the region. On this basis we can accept that one of the conditions and requirements of sustainable physical-spatial development of metropolitan area is establishment of an effective control system for its physical-spatial transitions. This

matter should be followed in policies and national, regional and local strategies.

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