

## EVALUATION OF NEW TOWNS CONSTRUCTION IN THE AROUND OF TEHRAN MEGACITY

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**Abstract:**

Rapid pace of urbanization which has affected third world countries is a by-product of the post-1945 period. In most developing countries like Iran, spatial population distribution is not balanced, leading to the deficiencies in services, hygiene, formation of slums, and etc. To balance those patterns in the country, different strategies have been applied, one of which is the construction of new cities. This study aims to examine the role of new cities in balancing spatial population distribution in Tehran province. For this purpose, first, the changes in the population of Iran and its urban mechanisms are studied; then, the performances of new towns in previous decades are examined. To analyze data and investigate the role of new cities, entropy coefficient model was used. The results showed that new towns of Tehran have not affected population overflow and deconcentration successfully; as a result, urban officials need to revise construction policies in those cities.

**Keywords:**

New towns; urban systems; population; decentralization; the coefficient of entropy; Iran.

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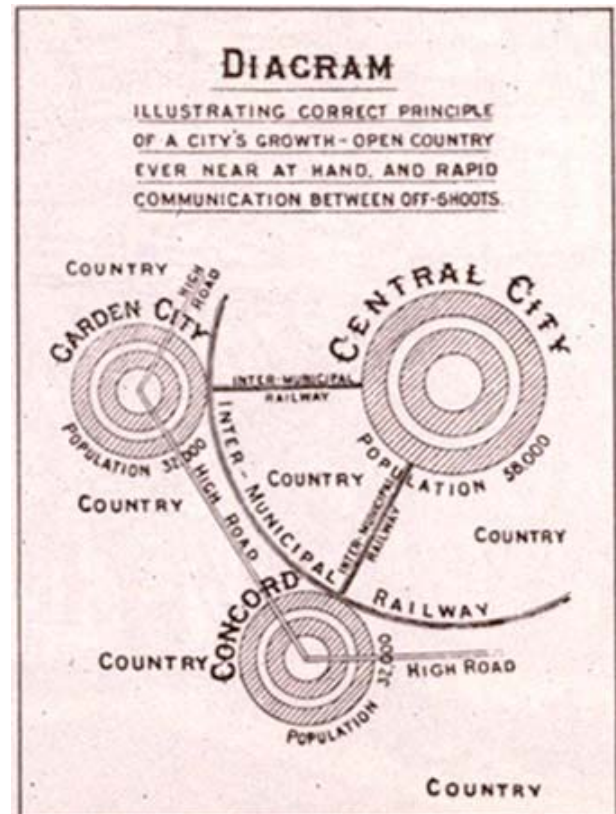
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## INTRODUCTION

New towns have been created during the history for many commonplace reasons, including: security, economic, demographic concerns and etc. But after Industrial Revolution, the trend of constructing new cities has been completely different from the past (Qrakhlu & Abedini, 2009). Since 1961, following land reformation plans, Islamic Republic of Iran and economic changes at global level, assembly industries were developed beside big cities, leading to rapid urbanization and the expansion of urban areas, creating many problems. Since 1961–1978, three major factors affecting rapid urbanization included migration of villagers to the cities, urban life's blooming and fast population growth, and converting rural areas to urban places. The impact of population on the number of urban areas was also evident (Mashhadizadeh, 2010).

Almost all statistics after the revolution have revealed a continuation of large-scale urbanization and an increasing tendency towards the concentration of urban population in a few big cities. The proportion of urban population to the total population of the country in 1976 reached 47%, while, it increased to 61% in 1996. Both the increase in the number of urban places and population increase in the cities have contributed to the process of urbanization (Fanni, 2006).

Based on the statistics of 1957, published by Statistics Department of Iran, the number of the cities were 199. But, the statistics showed the number of 1,000 for the cities in Iran in 2006 (Barakpoor & Asadi, 2011). Regarding the mentioned points, growing urbanization, preventing from the growth of macropolitans and controlling natural growth rate of population, immigration needs to be monitored. If this fails, restoring the structures of the old cities is the best method for urban development. In the case this template does not control growing urban population, continuous development of the cities are considered in the places which are not faced with natural or artificial constraints. If these patterns do not work, other places should be regarded outside the metropolis for absorbing its population overflow. Since two first-mentioned patterns have not fulfilled desired goals, urban planners and policy-makers have resorted to decentralization of metropolises as a template to create new cities (Ebrahimzadeh & Negahban Marvee, 2006).



Map 1. Pattern of Garden cities

## Research theories and background

The term “new town” is interchangeable with “new community” in many cases. For the purposes of this study the following definition was found appropriate: “A self-contained development with a balance of commercial, educational, social, and cultural institutions that satisfies all the needs of families and individuals alike”. The following is a list of:

- Large scale planned community.
  - Programmed to include a balance of housing, jobs, and services.
  - A mixture of housing types.
  - Created in response to clearly stated objectives
- Controlled by a master developer (Pavlovich Howard, 2002).

Spatial decentralization policy based on building new cities is one of the most straightforward patterns. Simply put, the original and still most weighty reason for building new towns in the minds of their advocates and pioneering experimenters was the necessity of reducing the concentration of people and workplaces in large towns, which otherwise cannot be relieved of congestion,

disorder and squalor and rebuilt on a fully healthy, socially satisfactory, or efficient pattern.

In this context, the idea of creating new cities has been attributed to the English people. In 1898, the public in Britain was concerned about the influx of the people to the cities, leading to densely populated urban areas as a result of evacuating rural regions. In such conditions, "Ebenezer Howard"'s solution seemed less troublesome, without relying on any kind of sudden and radical changes or revolution. He was aware of the attractions of metropolises for villagers; so, he aimed to mix the advantages of urban life with the beauty of villages, creating town gardens. Developed in definite distances around a metropolis, such towns have a green belt around, connected via fast public transportation vehicles (Austrufsky, 2008). Until World War II, only two satellite cities of Latchverth and Welvyn were built with thirty-five thousand inhabitants. Great Britain had a population of ten millions; but, despite the predictions of Howard, two newly built towns around London could not prevent population influx to the capital city of Great Britain. After World War II, the construction model, suggested by Howard, revealed its positive results, benefiting from governmental support.

The pattern of new towns was adopted as a foundation for the organization and refinement of big cities. New towns can be planned and constructed in different models of satellite, independent, permanent, recreational and political-administrative types in Europe, America, Australia, Asia and Africa. Village garden, precinct garden, town garden, satellite town and New Towns represent different international models that have been planned and constructed on the basis of the garden cities' conceptual framework, expanded globally (Ziari, 2006). In the third world countries, this theory was employed to enforce the strategy of decentralization, land use planning, establishing growth hub, regional development, transferring the office centers, spatial organization of small towns creating service hubs for rural areas, making centers for integration of village and reconstruction of demolished towns with various results. Totally, these towns were successful in providing housing for low-income households; but, their physical, social and economic structure was not consistent with local environment; therefore, they were considered luxurious and costly commodities that only caused the social imbalances. Even in some cases the slums were combined with the metropolises because they were designed according to local policies, overlooking the comprehensive national and regional strategies (Seyed Fatemi, 2010). In an article titled, «New town

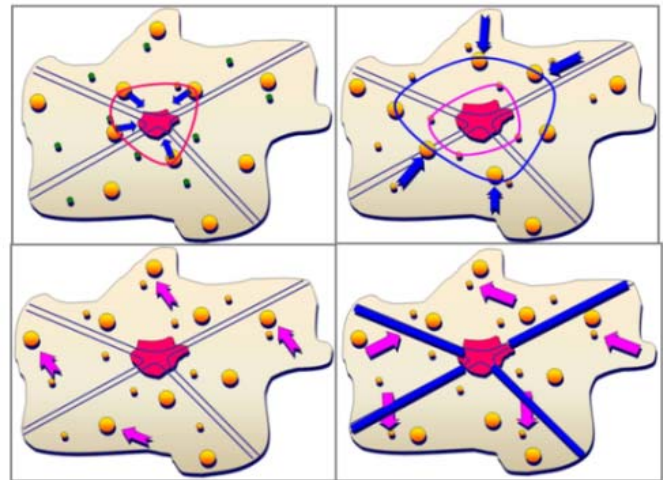


Fig. 1 The process of settlement development in the theory of Joseph Hylhorst.

development in Jakarta Metropolitan Region: a perspective of spatial segregation», (Firman, 2004) concluded that the development of new towns in the Jakarta creates spatial differentiation for three reasons. First, it has polarized the average and well-paid groups, resulting in scattered ness of exclusive residential areas. Second, within the new towns themselves, middle and high class people occupied exclusively designed areas with the highest possible security. Third, in several new towns, urban development management is carried out by the developers instead of the city hall. In another article titled «A study of commuting pattern of new town residents in Hong Kong», the suggested results of Hui et al. (2005) showed that despite the ideal and established imaginations, improper planning laws and vocational and educational conditions in these cities have led to daily trips from new cities to old suburban areas. In a comprehensive study on new cities of America, six key factors in the development of new cities were listed as follows:

1. Timing includes Market Feasibility;
2. Location includes Growth of metropolitan areas; distance from metropolitan centers and access to major highways or transportation links;
3. Financing includes private or public financing, stable financiers and prior ownership;
4. Developers include amount of experience, financial resources and number of developers;
5. Industry includes employment base and expansion of services;

**Table 1.** Population changes of Iran between 1957–2007

Number of cities	Urbanization percent	Population of rural areas	Population of urban areas	Rate of population growth	Total population of country	Year
200	31.4	12 952 083	6 002 621	—	18 954 704	1957
272	38	15 992 912	9 795 810	3.13	25 788 722	1967
373	47	17 854 064	15 854 680	2.71	33 708 744	1977
496	54.3	22 600 449	26 844 561	3.91	49 445 010	1987
612	61.3	23 237 699	36 817 789	1.96	60 055 488	1997
1012	68.6	22 235 818	48 259 964	1.62	70 495 782	2007

6. Government includes permitting process, relationship with local region and political support. (Pavlovich Howard, 2002).

In recent years, because of the fast growth of big cities in developing countries and the existence of empty new towns, some researchers have proposed that development plans should be prepared based on the dynamism of small and intermediate towns (Shokooi, 2006).

One of the most important theories in the field of spatial development belongs to Joseph Hylhorst. Due to the importance of spatial development strategies to eliminate interregional, intraregional, and sectorial duplications, proportional to hierarchy of settlements and residents, Hylhorst suggests four different strategies (quoted by Ardeshiri, 1993): 1. concentrate consolidation; 2. dispersed consolidation; 3. concentrate expansion; 4. dispersed expansion.

Hylhorst posits two main suppositions in those four strategies: expansion and consolidation. Reinforcing self-concentration (i.e. convergent forces), the former is used for the provinces or regions which are at the elementary phases of development, ranked among deprived or poor provinces. While, the latter focuses on around center reinforcements (i.e. divergent forces).

Expansion stage has two different strategies based on area location. For properly distributed and developed areas convergent concentration is offered. Investment in a new regional center or second-grade regional centers is a basic suggestion of this theory. The last phase of development is using divergent concentration (**Fig. 1**). This strategy suits for the provinces with balanced spatial structure, aiming to transfer development across the whole region and its nearby (Hylhorst, 1971).

## Materials and Methods

This study used library method to gather data. Exerting extant documents, the performances of the new towns were studied. Via statistics, population changes and urban mechanisms were investigated.

Entropy coefficient model was used for data analysis. This standard model is a measure for examining the distribution of urban population and the number of the cities in a region. This model can be used to examine the balance of population and city number in urban, provincial, regional, and national levels. The overall structure of the model is as follows:

$G = (-\sum P_i \ln P_i) / \ln KG$ : Coefficient of Entropy

$K$ : Number of Floors

$P_i$ : Abundance

$\ln P_i$ : Frequency logarithm of Neperly

In this model, if the entropy tends to zero, there will be higher concentration or imbalance in population distribution in the cities; while, moving toward 1 or above reveals a more balance distribution in the region (Hekmatniaand & Mousavi, 2006).

## Changes in population and urbanization growth

Since 1869–1957, urban mechanisms in Iran were homogenous and balanced in a way that no city had superiority to the others. Every city served and connected its surrounding villages with convergent and consistent concentration (Ziari, 2006).

Based on the first official statistics of 1957, the population of Iran was estimated to be 18.9 million people, raising to 25.7 million people in 1967. Then, Iran had a population growth of 3.1%.

During 1967–1977, population growth rate was 2.7%, reaching 3.9% by the next decade. In 1966, Iran faced with a declining growth rate of the population with the estimated population of 60 million. The next decade witnessed a declining trend again. In 2006, Iran had a population of 70.4 million. Thus, Iran had a decreasing population growth rate in two last decades.

The reasons of the such decline in the annual population growth rate are attributed partially to the government's family planning efforts since 1989 and the dismal economic conditions and general decline in living



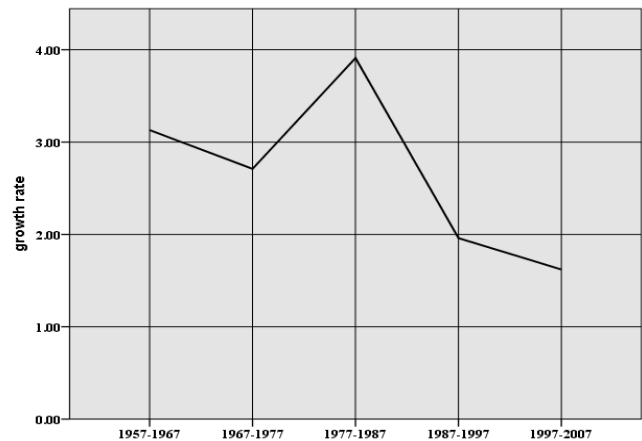
standards for the average Iranian households (Ziari, 2006).

Population and housing studies in 1957 to 2006 indicate a population increase of about 52 million people in Iran. Like many developing countries, urbanization in Iran has a growing trend. According to the Population and Housing statistics in 1957, the urban population of Iran with 200 urban areas was approximately 6 million people, raising to 15.8 million within twenty years to the Islamic Revolution. After the Islamic Revolution of 1957 until 2006, the urban population of the country increased to 48.2 million. In a fifty-year period from 1957–2006, urban areas reached 1012 areas. The statistics suggest that the urbanization coefficient increased from 31.7% in 1957 to 68.5% in 2006.

**Figure 2** shows that until 1977, rural population was more than urban population. But after that urban population exceeds. Migration from rural to urban areas is the major reason for rapid urbanization in Iran. The declining employment opportunities and living conditions have forced the rural population to migrate. The important cities of the country are Tehran, Mashhad, Isfahan, Tabriz and Shiraz at the moment.

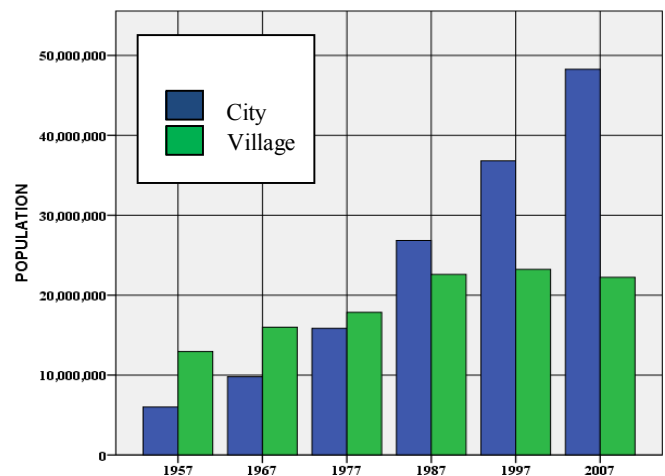
Despite the increase of population in five metropolitan areas, their contribution to the total population of the country was 43.5% in 1956 and 33% in 1996. Due to the inflation of house prices and also settlement in cosmopolitans, the establishment of disordered and sprawling towns at the periphery of the largest cities is observed (Ziari, 2006). The rapid growth of urban population in developing countries in the past decades has resulted in numerous problems such as congestion, pollution, unemployment, housing shortage, and inadequate urban services. In order to manage urban growth and its related problems, developing countries have relied upon several policies such as family planning, rural development, regulating rural-to-urban migration, limiting the growth of large cities, development of medium-size cities, and new town development. The principal objective of the new town development policy has been to relieve population pressure in large urban areas (Atash, Shirazi beheshtiha, 1998).

As a developing country, Iran has recently faced with increasing population and migration. Based on expert estimates of the population, Iran's population will reach 130 million people in 1400, from which 100 million will be living in the cities.



Hairy Issue 1: Population growth rate trend from 1957 to 2006.

Source: Statistical Center of Iran, adopted by the authors.



**Fig. 2** Comparison of the population in rural areas than in urban areas with populations of 1957 to 2007.

Source: Statistical Department of Iran, adopted by the authors.

### Performance of the new towns in Iran

The rapid growth of urban population and the patterns of urban population distribution require government plans to settle the future urban population in the existing urban areas and new towns. First, by preparing long term master plans, the government will attempt to make the existing urban areas absorb some parts of the surplus urban population. Second, using new town strategies, the government plans to distribute the urban population among a number of new communities, built around the existing large cities in the country. Beginning in the mid-1970s, Iran initiated the new town strategies in order to decentralize population and economic activities from the large cities to new towns around them. In the 1970s,

several new towns were proposed and developed, planned as residential communities or industrial towns around a few large cities such as Tehran and Esfahan (Atash, Shirazi beheshtiha, 1998).

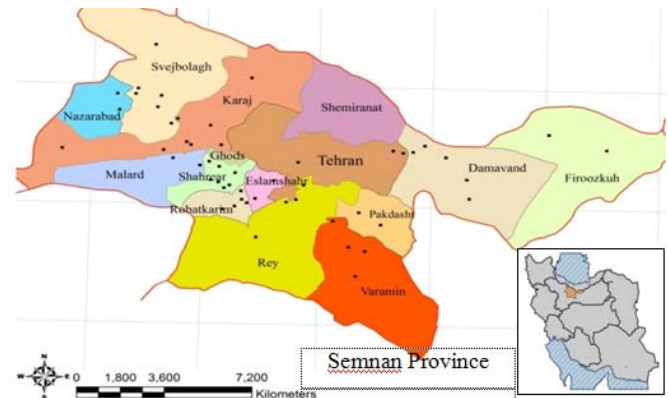
The urbanization system of Iran can be evaluated in four periods:

- 1- In the distance between the two world wars, new towns of Iran were planned without specific strategy evolved around a core rural area. For example, Zahedan and Noshahr which are regarded thriving at the moment.
- 2- During World War II until the mid-1960s, Iranian towns were developed without specific strategy, evolving around an urban core for the development of oil and other industry.
- 3- From mid-1960 to 1969, new towns were formed with the aim of exploiting natural resources without any primary nucleuse, regional development, land use, or housing.
- 4- Aiming to spatially organize and revise metropolitans and balance their economic growth, 28 satellite towns were developed without a primary core to settle 6 million people until 2016, absorbing population overflow. The plan of Urban Development after Islamic revolution was first legislated by the Committee of Governmental Employees Welfare in Housing Ministry which led to Act No. 108328, as the main key in decision-makings for this plan. After legislation of this this act, 24 other towns were built and 11 more towns are being constructed (Ziari, 2006).

It is important to point out that the urban population of the country was over 48 million persons in 2006, while only 7.9% (3.8 millions) of this population were settled in new towns. On the other hand, the decision was to settle 1.6% of this population in these towns by the end of the fourth development program; thus, calculating the present population of these towns, only 0.7% of the urban population of the country could be settled in new towns. The key question is that can any other strategy be a proper alternative in order to attract and settle this 0.7% of urban population, excluding the construction of new towns?

The most important problems in these towns are as follow:

- Dependence on one economic activity and the single base of employment;
- Exclusive ownership of the houses and lands of the city by the company;
- Uniform organizational house pattern;



**Fig. 3** Tehran's position in the country's political divisions and urban centers of the province.

- Dependence on the services of the company;
- Separation of the town from the network of the cities and villages in the area;
- Lack of development;
- Social and cultural conflicts;
- Heavy maintenance costs;
- Dormitory nature of the towns (Ziari, 2006).

## STUDY SCOPE

As one of the thirty provinces of Iran, Tehran has 15 cities, 37 districts and 83 villages. Urban areas of the province consist of 56 towns and 1201 villages with inhabitants. Tehran Province has an area of about 18 814 square kilometers, located in 34 degrees and 52 minutes to 36 degrees and 19 minutes of north latitude and between 50 degrees and 10 minutes to 53 degrees and 10 minutes east longitude from Greenwich Hour Circle. **Figure 3** shows the location of Tehran Province and its subdivisions with their centers.

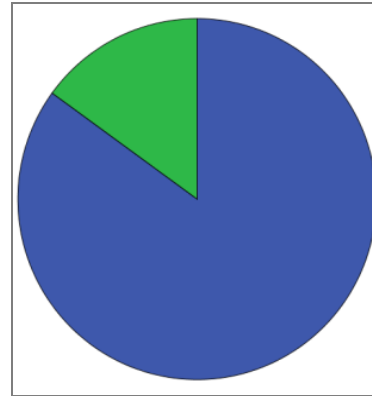
## Population changes and entropy coefficient analysis of urbanization mechanisms in Tehran

Development and population density are the main features of the urbanization mechanisms in Iran. Tehran has maintained its superiority in economic and social aspects of this system. As a metropolitan area, Tehran has dominates in political, organizational, and economic aspects over other cities. Then, like any other third world country, Iran has a first urban template (Jajromi and Gheibi, 2011).

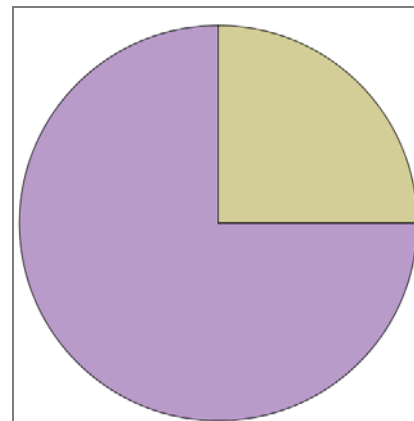
According to the statistics, released by the Statistics Department of Iran (**Table 2**), 5.3 million population of

Tehran in 1976, with the average annual growth of 4.3% increased to 8.1 million people in 1986. Then, this trend could not be due to the natural growth of population; instead, it resulted from the huge volume of immigration to the province. Especially in this era, refugees of other war-strike cities rushed to Tehran (Ghavidel and Razzaghi, 2008). The population growth rate in the next 10 years had a reduction, showing the average annual growth of 2.5%. Population in 1996 reached 10.3 million. Population growth rate from 1996 to 2006 remains relatively constant with a slight increase. Average annual growth during this period was 2.64%, raising to 13.4 million.

Based on the statistics of 1976, 1986, 1996, and 2006 there were 18, 19, 25 and 51 towns in Tehran, respectively. During these years, Tehran Province had 30.71, 26.05, 24.20, and 25.39 percent of the country's total population in 1976, 1986, 1996, and 2006. In the last four statistics, Tehran has included 25% of the total population of the province (Jajaromi and Gheibi, 2011). A simple review of these statistics shows that the settlement balance of this province is not proper and follows first urban template; in a way that in the past four decades, 85% of the population of Tehran Province have resided in Tehran City itself (**Table 2**).



**Fig. 3** Comparing the ratio of Tehran City's population to the total population of Tehran Province.



**Fig. 4** Comparing the ratio of Tehran City population to the total population of Iran.

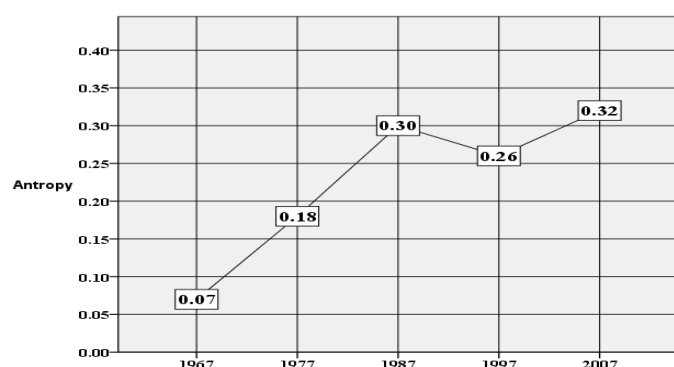
**Table 2.** Population changes of Tehran between 1977–2007

Number of cities	Percent of urbanization	Population in rural areas	Population in urban areas	Population growth rate (percent)	The total population of the province	Year
18	0.92	384 250	4 947 367	-	5 331 627	1355
19	0.90	767 691	7 339 742	4.3	8 107 433	1365
25	0.89	1 093 641	9 250 145	2.5	10 343 965	1375
51	0.91	1 161 935	12 260 431	2.64	13 422 366	1385

**Table 3.** Details of new cities around Tehran

Final predicted population of the town	Fulfilled population until 2006	Population projections till 2006	Year of beginning activities	Distance from metropolis (km)	New town
200 000	58 000	90 000	1370	35	Pardis
132 000	100 000	95 000	1371	25	Andishe
150 000	5 900	35 000	1369	40	Parand
500 000	47 320	83 000	1367	65	Hashgerd
982 000	211 220	303 000	—	—	Total

Source: Statistical department of Iran, adopted by the authors.



**Fig. 5.** Entropy changes in the past decade.  
Source: Qrakhlu & Panahandehkhah (2009).

#### Help:

- The share of the total population of the country's population of Tehran
- The share of the total population of the province's population of Tehran, Tehran

These figures reveal that as a center of all facilities and services in recent years, Tehran has witnessed increasing immigration and population growth in itself. The entropy model has analyzed the role of new towns in urban mechanisms of Tehran Province. Entropy value of below one shows the imbalance of population distribution and settlement in all studied periods. During 1966–1986, entropy value has an ascending trend toward 1, revealing the movement toward balance. But, it reaches 0.265 in 1996 from entropy value of 0.304 in 1986, revealing its reconcentration. The reason for this result can be the occurrence of *Iraq-Iran War* which forced the people to resort to Tehran, escaping from border-line cities. This value reached 0.326 in 2006, implying a relative balance. Totally, based on the statistics, the construction of new towns does not show any significant effect on balancing urban mechanism of Tehran Province.

#### The performance of new cities in Tehran Province

Officially announced aim of developing new towns has been summarized in a few words: “detached metropolitan development”. In this respect, proper distribution of the overflow of Tehran City's population in urban areas (Parand, Pardis, Andisheh, Hashtgerd towns) with a comprehensive plan is the main purpose of constructing new towns (Zebardast & Jahanshahloo, 2007).

At the time of legislating comprehensive plans new cities, a definite population was determined for each of

them in a specific period. The related information in this respect are reflected in **Table 3**.

As seen in **Table 3**, Andisheh Town has been more successful than others in absorbing defined population. Pardis, Hashtgerd, and Parand occupy the next ranks, respectively. Thus, only Andisheh Town has acted relatively successfully in attracting related population. This can be for providing enough educational, recreational, and cultural facilities for the citizens. But, Pardis, Hashtgerd, and Parand in the lower ranks have not had significant performance in this respect. Generally speaking, these cities have not been successful in their missions. Regarding the poor performance of these towns, new ideas in constructing them should be utilized and the old ones should be revised. As mentioned in the earlier sections of this paper, according to four development stages of Hylhorst, Tehran Province is still at the first stage of development. As a result, population attraction strategies should be fortified, communication with small and intermediate cities around should be strengthened, and the strategy of scattered cohesion should be utilized to balance urbanization and deconstruction of Tehran City.

#### CONCLUSION

Reviewing the statistics and analysis reveals that total population of Iran and urbanization have had an ascending trend. Population concentration in some specific urban areas reveals the imbalance of population distribution and the lack of considering urban hierarchy in the country. Then, urban policies have revolved around the continuum of balancing residents and deconstruction in the cities. Examining these issues, this study concluded that newly developed cities only respond to the dormitory conditions of big cities. Not only they were developed without economic, social, and vocational considerations; but also they could not remove the population overflow from metropolitans. These issues necessitate more careful planning for present and future cities, revising old policies, and exerting the successful experiences of newly established towns at regional, national, and international levels. Improving the transportation and communication of these towns with their neighbors and other metropolitans should be highly regarded as well.

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