فصلنامه مدیریت شهری
(ضمیمه لاتین)
Urban management
No.**46** Spring **2017**
175 - 190
Received *23 Sep 2016*; **Accepted** *11 Dec 2016*

Analysis of Impacts on spatial planning objectives in the New Cities using network techniques (ANP) (Case Study: New Cities in Gulbahar and Binalood)

Samira Dehghan Nayeri- *PhD student in Urban Development, Department of Urban Development, Faculty of Arts, Architecture and Urban Development, Islamic Azad University, Najaf Abad Branch, Najaf Abad, Iran*
Elnaz Behzadpoor- *Master of Regional Planning, Department of Urban Development, Faculty of Arts, Architecture and Urban Development, Islamic Azad University, Qazvin Branch, Qazvin, Iran*
Behzad Ebadollahpur Maleki- *Master Structural Engineering, Civil Engineering Department, Faculty of Engineering, Islamic Azad University, Bushehr Branch, Bushehr, Iran*
Nasser Haj Mohammadi[1]- *Faculty of Environmental Higher Education, University of Tehran, Tehran, Iran*

Abstract
Following the creation of economic, social and environmental issues in metropolises, strategies aimed to build new cities to decentralize, attract the overflow of crowed population and reduce its activity, in order to enhance the quality of life and to organize the population and activity in urban areas. In the present study, the role of spatial planning for new towns in the metropolitan suburbs of Mashhad or in other words, the role of these new towns on the space balance, creating the employment and self-sufficiency and to absorb some part of Mashhad's population has been studied. In this regard, in addition to the library studies and comparisons of existing status with the predicted targets for studying new cities, two series of questions regarding the condition of every new town, as well as analysis network process (ANP) were used to assess their success and to rank them. Results showed that the infrastructure's indicator plays the greatest role in the success or failure of these cities in achieving their goals, so if the government does not provide the platform and infrastructure, new towns policy does not help resolve the crisis of metropolitans. After infrastructure, employment, attraction of people and accessibility have almost equally important and are in secondary importance. Eventually, our results revealed that Gulbahar has been more successful than Binalud, According to the results of the present study, the coordinated and proper management at national and regional levels, especially in the Mashhad conurbation, creation of employment opportunities, improving the identify and the quality of new towns and provide appropriate services is necessary and essential to citizens.

Key words: *spatial planning, new town, new town Gulbahar, new town Binalud metropolis Mashhad*

1. Corresponding Author, Tel: 09126268478, Email Address: unescap@gmail.com

Introduction

The formation of new cities in the world has a long history. If the history of the formation of new cities is followed a little deeper and more realistic, we must see major cities, Babylonian, Assyrian, Persian or Greek mentioned earlier in our ancient civilizations. Later, during the Middle Ages, many cities in Europe were built by religious groups and Kings. Construction history of communities and planned complexes, which are now called "new towns" dates back to the late nineteenth century and early twentieth century. Idea of these cities were mainly developed by theorist Ebenezer Howard, who first introduced design of garden cities for the metropolis of London; and it was after this theory that the different designs of new cities around the world and with different goals attracted attention of of planners and architects and it was during the social and intellectual developments of the twentieth century that the theory of satellite towns, suburbs, neighborhood and new towns were formed (Ziari, 1997: 34). Lack of Spatial Planning in the country has caused the distribution of population and economic activity not be comprehensive and directed national program. In Iran's urban system, the development of big cities such as Tehran, Mashhad and focus on their activities have caused to attract more people from all over the country to the cities. This problems has caused problems such as lack of housing, lack of infrastructure, environmental pollution and social problems of cities. One of the main strategies to deal with these problems is the construction of new towns in the sphere of influence of the cities. Construction of new towns policy aim to implement the decentralization policy, attract an overflow crowd of big cities, create employment and avoid marginalization, create ecological balance of the region and its growth and balanced development of the region. Over the decades the construction of new towns, it is suggested that manner of communication and interaction with new cities and urban metropolis has turned them into dormitory towns which only needs to resettle the inhabitants of large cities and are responsible for the employment issue in large cities.

1- Theoretical foundations

1-1- Land use and new towns

- Concepts related to spatial planning

In academic and political literature, the term spatial planning or land use, has different definition to dates. Basically, land use relates to the issue of coordination or integration of the spatial dimension of sectoral policies based on a territorial strategy. Among sectoral policies, land use identified tensions and conflict in a more complex way than a simple land use setting (Cullingworth and Nadin, 2006: 91). Other definitions of land use planning include those mentioned in Europe spatial planning book in which spatial planning is viewed as a very inclusive method used by the public sector to influence the future distribution of activities in space. In the UK, government defined spatial planning beyond the traditional land use planning to integrate policies for development and land use along with other policies and plans affecting nature and function of spaces. This includes policies that can be effective on land use but may not be only or mostly transmitted through the granting or refusal of planning permission and may be done by other means (United Kingdom Office of the Prime Minister, 2005). In Slovenia, land use planning is defined in the spatial planning 2002 as an interdisciplinary activity to include land use planning, determining the conditions necessary for the development and deployment of activities, identifying required measures to improve the physical structures and setting conditions necessary for the deployment and construction of the physical structure (Allmendinger & Haughton, 2010: 804). In Iran, in the basic studies of land use planning, the concept is defined as follows; land use is regulating the relationship between man, space and human activities in space for rational exploitation of all human resources and space in order to improve the physical and spiritual status of

society based on religious values, according to cultural background and with the tools, knowledge and experience over time. By this definition, land use planning is associated with comprehensive, spatial, qualitative, long-term objective and executive attitude. This attitude can lead sometimes to "policies", and sometimes to "codified programs" of land use planning depending, scope of applicability, level of knowledge of the issues, the accuracy and spatial and temporal scope (PBO, 1985: 12).

- New towns and decentralization of urban areas

Only after the beginning of the twentieth century, this concept become focus of attention in a comprehensive and integrated manner and Howard addressed combination of previous ideal elements in integrated manner, and after that, the principles of planning of new towns were taken into account (Howard, 1946: 50).

Planning and establishment of new towns is one of the oldest practices in human settlements and has been focus of attention since the Egyptians, the ancient Persians, Greeks, Romans, medieval and Renaissance and for military and economic purposes, and for transport, beliefs, natural resources, the creation of new capital, reduction of urban and regional development (Shekar, 2004: 93-94).

What is more considered in planning of cities is regulation of urban communication network, its zoning based on the criteria of urban development and urbanism and extension of the organic relationship between the city and other villages in the region that is to lead to organizing of communication, coordinated and balanced distribution of human settlements and activity centers (Farid, 2003).

The development of new towns aims to create town centers within a distance from the main city that can also benefit from the top-level facilities and services in big cities. Accordingly, the large cities are accepted as the main center of activity and attempt is made for physical expansion and population density to be controlled and thus provide a good model for residential centers (a group of Consulting Engineers, 1992: 11-9). In terms of urban development policies, new cities receiving overflow are constructed for improvement and organizing metropolitan areas through decentralizationand distribution of population around them (Goany, 1976: 80). New satellite cities construction formal theory was first proposed by Leonardo da Vinci to avoid the problems of overpopulation for the city of Milan (Mozayyeni, 1994: 260). Ward and Hll proposed in urban development strategies in the new millennium the new towns as a solution in the sub-region level. But those new communities are different from Garden Cities in the 1940s and 1950s and propose model of disconnected suburbs as another kind of new towns as well as factor of access (proximity to the metropolis via fast communication channels such as rail transport) of new cities, which are designed to absorb the overflow of population of metropolis, as a very important factor (Ward & Hall, 1998: 152).

Indicators affecting the realization of goals in the new towns land use planning

When we speak of a new town, in designing spaces, urban planning and selection of transportation systems and utility, expectation to achieve a higher standard than the existing cities arises. Citizens move their location from a metropolis or a small town in the region to a new town to reach their goals, and have higher expectations than their previous status in terms of housing and urban services in general (Etemad, 1997). One of the reasons that people who choose new cities are satisfied is the satisfaction of the major goals the families moving to the new city are trying to achieve. In studies on planning of new towns, the fact should be included that it takes at least 30 years to build a new town, and of course, all such waiting for the city is impossible and the dissatisfaction of the residents will follow. In newly built towns, just attracting households and vulnerable populations of the cities with promises, programs without realization of them is not enough, but

keeping residents and meeting their needs is very important. (Bazi and Afrasiabi Rad, 2009: 111-134).

The results of the new towns plans on a balance between housing and employment or self-sufficiency has been successful in some cities around the world. Merlin believes that the new towns in Europe have been able to achieve a balance between housing and employment (Merlin, 2000: 9). One of the main advantages of urban settlements is access and access and distribution of it are the main indicators of the quality of settlements. One of the important purposes for daily mobility of the urban population is active population displacement between their house and their place of employment (Farid, 1368: 390). The pattern of movement of workers varies in different countries; for example, in studies conducted in the United States, Malt has concluded that a high percentage of low-income workers go to work by private car (Malta 1999). However, in developing countries, Vehicle ownership is considered an advantage and depends on economic status and family income. Planning for economic structure in the less developed regions and countries, where the new town is a tool for achieving growth and creating growth poles, is very important. In these regions, the new town must be considered in the context of a comprehensive economic program of the region and its role and objectives must be drafted given those programs. In these cities, there may not be grounds (such as transport, energy, industry, etc.) necessary to create the economic basis or information and sufficient resources are not in place or planning or skilled labor is not available, each making them dependent on external sources and reducing its level of self-sufficiency (Golany, 1976: 123-147).

2- Methodology

The methodology of this research in terms of method was descriptive-analytic and in terms of purpos was applied. Descriptive-analytic method is based on defining and describing the basic concepts and factors affecting the issue studied. In this method, we try to provide a logical analysis of the subject and its components and its influencing factors are identified. And finally, through the analysis of these factors and evaluating the effectiveness of them on subject, suggestions worthy are provided (Naderi, 1996: 98). In this study, it was tried to investigate various aspects of the subject and objectives of master plan and feasibility thereof, by providing an analytical

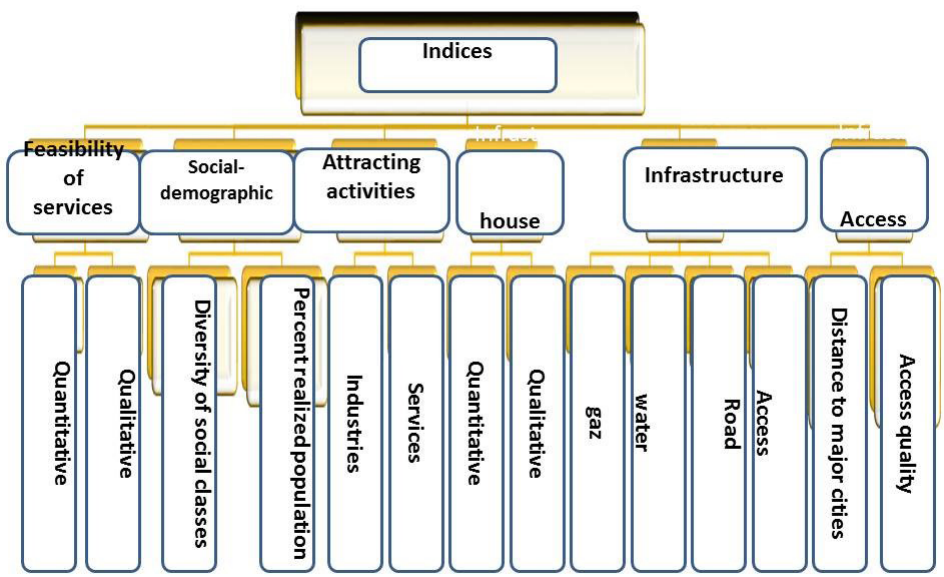

Figure 1. Factors affecting the realization of land use objectives of new towns

model of the factors affecting the success of new towns of Binalood and Golbahar, indices were prioritized and the degree of success of each alternative was determined. For data collection, various tools such as observation, interview, questionnaires and documents were used. Each researcher should consider nature of the problem and hypotheses,to design one or more tools for data collection. In this study, data collection instruments were questionnaire and taking notes.

Analytic Network Process (ANP)

Analytic Network Process is a multi-criteria assessment method that is extended for of Analytical Hierarchy Process (AHP). The first time it was introduced by Thomas Saaty. This technique is a comprehensive and powerful tool for precise decisions, using empirical data and judgment of decision-making and to provide a structure for organizing different criteria and evaluation of the importance and priority of each of the alternatives, thus making decision-making process easy (Lin, 2009: 4137). In fact, analytical network process (ANP) considers each theme and issue as a "grid" of criteria, sub-criteria and alternatives (all these are called elements) that have gathered together in clusters. All the elements in a network can be related with each other in any manner. In other words, in a grid, feedback and interaction between clusters is possible. (Sehat, 2009: 111)

3- Findings

- Analysis and Evaluation of factors influencing feasibility of goals in the new town land use planning using Analytic Network Process (ANP)

Analytic Network Process (ANP) in the study area

1. Determining the model: First, factors for achieving the urban development goals wre derived from theoretical and empirical literature related to development of new towns and having ensured their compliance with new cities of Binalood and Golbahar, related criteria and sub-criteria were also identified. Then those criteria and sub-criteria were studied. After identifying the criteria and sub-criteria are effective in achieving the goals of development of new towns, the connection between criteria and sub-criteria should be specified.

2- Defining the relationship between factors (criteria and sub-criteria)

At this stage, according to the network structure model (Figure 1), the overall structure of super matrixes is also determined. So accordingly, we have table 1.

3-Forming comparative matrixes and controlling their compliance

At this point a comparison matrix of main criteria, interdependence of main criteria, sub-criteria and sub-criteria interdependence and compatibility are also controlled.

Binary comparison of its main criteria and weighted vector resulting from it, namely, W_{21} , So first the interdependence of the six criteria (access, infrastructure, attracting activity, absorption of population, feasibility of services and housing) were measured and then compared in a binary manner.

After examining the interdependence of the main criteria, we compared the main criteria binarily and weighted vector resulting from it, that is, , was obtained (Table 3)

		Clusters		
		Objective	Main criteria	Sub-criteria
Objective		0	0	0
Main criteria	=	W_{21}	W_{22}	0
Sub-criteria	w	0	W_{32}	W_{33}

Table 1. Initial super matrix structure (non-weighted)

فصلنامه مدیریت شهری
(ضمیمه لاتین)
Urban Management
No.46 Spring 2017

Criteria	Aces s	Infrastructur e	Activit y	Socio-demographi c	Service s	Housin g
Access		√	√	√	√	√
Infrastructur e	√		√	√	√	√
Activity	√	√		√	√	√
Socio-demographic	√	√	√		√	√
Services	√	√	√	√		√
Housing	√	√	√	√	√	

Table 2. The interdependence of the main criteria on each other

W_{21} =

access	0.131
infrastructure	0.405
activity	0.184
social-demographic	0.185
services	0.056
housing	0.039

Table 3.W_{21} weighted vector

مدیریت شهری
فصلنامه مدیریت شهری
(ضمیمه لاتین)
Urban Management
No.46 Spring 2017

4. Binary comparison of interdependence of main criteria (matrix)

To understand the interdependencies between the main criteria, binary comparison between the main criteria is performed in order to achieve matrix elements. Then for calculating importance of each of main sub-criteria (given the interdependence between them), binary comparison of the other main criteria (with control of the first criterion, ie access) takes place.

Questioning of factor of importance in this case is as follows: how much is relative importance of the criterion of "activity" in comparison to the criterion of "services" when criterion of "access" is controlled? Similarly, the relative importance of all criteria is measured against the control each of them, which takes 5 forms. Thus, after the formation of five other binary comparison matrices, and controlling compatibility factor of each of them, the matrix related to main criteria for dependence is calculated. So after the formation of the said tables, putting eigen vectors for each of them, the results were as presented in the matrix below:

5. The binary comparison of the sub-criteria of individual main criteria (matrix)

At this step, the importance factor of each sub-criteria of six main criteria was obtained via binary comparison of them and these importance factors will form the columns of matrix . The result of binary comparison of sub-criteria relates to criterion of "access" that includes two sub-criteria of "quality of access and distance to the metropolis" and so other five criteria were compared by binary comparison in separate matrices and weighted vector

$W_{22} =$

	access	infrastructure	activity	social-demographic	services	housing
access	0	0.236	0.126	0.218	0.182	0.127
infrastructure	0.467	0	0.483	0.453	0.458	0.418
activity	0.244	0.321	0	0.196	0.150	0.192
social-demographic	0.139	0.335	0.216	0	0.162	0.176
services	0.091	0.66	0.108	0.081	0	0.43
housing	0.058	0.042	0.067	0.051	0.048	0

Table 4. Matrix of dependence of main criteria

$W_{32} =$

	access	infrastructure	activity	social-demographic	services	housing
access quality	0.333	0	0	0	0	0
distance to metropolis	0.667	0	0	0	0	0
water	0	0.250	0	0	0	0
electricity	0	0.250	0	0	0	0
gas	0	0.250	0	0	0	0
road	0	0.250	0	0	0	0
services and employment	0	0	0.333	0	0	0
industries and employment	0	0	0.667	0	0	0
social diversity	0	0	0	0.167	0	0
population absorption	0	0	0	0.833	0	0
quantitative services	0	0	0	0	0.667	0
quantitative services	0	0	0	0	0.333	0
quantitative housing	0	0	0	0	0	0.500
quantitative housing	0	0	0	0	0	0.500

Table 5. matrix

resulting from them are presented in matrix.

6. The binary comparison of the sub-criteria of individual main criteria (matrix)

At this stage the interdependencies between sub-criteria relative to each other is measured (Table 6) and then every two sub-criteria are compared and scored; for example sub-criteria associated with access are weighted, and then their weighted vector is obtained. Result of binary comparison and weighted vector of other interdependent sub-criteria are provided in matrix .

At this stage, the individual sub-criteria along with those with which they have interaction have been analyzed.

7. Binary comparison of preference of alternatives

At this step, preference for any of the alternatives is examined and judged in relation to the sub-criteria. When comparing alternatives, their preference is concerned rather than their importance. In Table 8, the value of each alternative in connection with any of sub-criteria is provided. The Table is evaluation criteria for preferable alternatives in relation to other sub-criteria. To determine the preferred alternatives in relation to other sub-criteria, such matrices have also formed and their eigen vector is calculated. The result of these calculations are presented in matrix.

8. Calculation of the limit super matrix

To calculate the limit super matrix the following steps must be carried out:

- Forming not weighted super-matrix

Given that all comparative matrices in structure of not weighted super-matrix (W_{33} W_{32} W_{22} W_{21}) have been calculated and their compatibility has also been controlled, by replacing these matrices in original Super-Matrix, not weighted super-matrix was obtained as in in Table 9.

Sub-criteria	access quality	distance to metropolis	water	electricity	gas	road	Services and employment	industries and employment	social diversity	Population absorption	quantitative -services	quantitative -services	quantitative housing	quantitative housing
access quality		√				√	√	√	√	√				
distance to metropolis	√		√	√	√	√	√	√	√	√				
water		√		√	√	√	√	√	√	√	√	√	√	√
electricity		√	√		√	√	√	√	√	√	√	√	√	√
gas		√	√	√		√	√	√	√	√	√	√	√	√
road	√	√	√	√	√		√	√	√	√	√	√	√	√
services and employment	√	√	√	√	√	√		√	√	√	√	√	√	√
industries and employment	√	√	√	√	√	√	√		√	√	√	√	√	√
social diversity	√	√	√	√	√	√	√	√		√	√	√	√	√
population absorption	√	√	√	√	√	√	√	√	√		√	√	√	√
quantitative services			√	√	√	√	√	√	√	√		√		
quantitative services			√	√	√	√	√	√	√	√	√			
quantitative housing			√	√	√	√	√	√	√	√				√
quantitative housing			√	√	√	√	√	√	√	√			√	

Table 6- Binary comparison of interrelation between sub-criteria

فصلنامه مدیریت شهری
(ضمیمه لاتین)
Urban Management
No.46 Spring 2017

	access quality	distance to metropolis	water	electricity	gas	road	services and employment	industries and employment	social diversity	population absorption	quantitative services	quantitative services	quantitative housing	quantitative housing
access quality	۰	۰,۱۹۳	۰	۰	۰	۰,۱۳۹	۰,۱۳۷	۰,۱۳۶	۰,۱۳٤	۰,۱۳٦	۰	۰	۰	۰
Distance to metropolis	۰,۱۵۵	۰	۰,۰۹۰	۰,۰۹۰	۰,۰۹۰	۰,۰۸۲	۰,۰۸۱	۰,۰۸۰	۰,۰۷۹	۰,۰۸۱	۰	۰	۰	۰
water	۰	۰,۱٤۳	۰	۰,۱۷٦	۰,۱۷٦	۰,۱٤۲	۰,۱۳۹	۰,۱۳۸	۰,۱۳۹	۰,۱۳۹	۰,۱۸۵	۰,۱۸۵	۰,۲۰۲	۰,۲۰۲
electricity	۰	۰,۱٤۳	۰,۱۷٦	۰	۰,۱۷٦	۰,۱٤۲	۰,۱۳۹	۰,۱۳۸	۰,۱۳۹	۰,۱۳۹	۰,۱۸۵	۰,۱۸۵	۰,۲۰۲	۰,۲۰۲
gas	۰	۰,۱٤۳	۰,۱۷٦	۰,۱۷٦	۰	۰,۱٤۲	۰,۱۳۹	۰,۱۳۸	۰,۱۳۹	۰,۱۳۹	۰,۱۸۵	۰,۱۸۵	۰,۲۰۲	۰,۲۰۲
road	۰,٤۱۲	۰,۱٤۳	۰,۱۷٦	۰,۱۷٦	۰,۱۷٦	۰	۰,۰۸٦	۰,۰۸۷	۰,۰۸۵	۰,۰۸۵	۰,۱۸۵	۰,۱۸۵	۰,۲۰۲	۰,۲۰۲
services and employment	۰,۱۱۷	۰,۰۵۳	۰,۰۷۸	۰,۰۷۸	۰,۰۷۸	۰,۰٦۵	۰	۰,۰٦۳	۰,۰۵۷	۰,۰۵۷	۰,۰۷۱	۰,۰۷۱	۰,۰۵۸	۰,۰۵۸
industries and employment	۰,۱۳٤	۰,۰۵۷	۰,۰۸۷	۰,۰۸۷	۰,۰۸۷	۰,۰۷۱	۰,۰٦۳	۰	۰,۰٦۳	۰,۰٦۳	۰,۰۸۱	۰,۰۸۱	۰,۰٦۸	۰,۰٦۸
social diversity	۰,۰۳۰	۰,۰۱۹	۰,۰۳۳	۰,۰۳۳	۰,۰۳۳	۰,۰۲۷	۰,۰۳۰	۰,۰۳٦	۰	۰,۰۸٤	۰,۰۲۹	۰,۰۲۹	۰,۰۲۵	۰,۰۲۵
population absorption	۰,۱۵۳	۰,۱۰٤	۰,۰۹۰	۰,۰۹۰	۰,۰۹۰	۰,۱۱۰	۰,۱۰۷	۰,۱۰٦	۰,۰۹۱	۰	۰,۰۵۰	۰,۰۵۰	۰,۰٤۲	۰,۰٤۲
quantitative services	۰	۰	۰,۰۲۷	۰,۰۲۷	۰,۰۲۷	۰,۰۲۲	۰,۰۲۲	۰,۰۲۲	۰,۰۲۱	۰,۰۲۲	۰	۰,۰۳۰	۰	۰
quantitative services	۰	۰	۰,۰۲٤	۰,۰۲٤	۰,۰۲٤	۰,۰۲۰	۰,۰۲۰	۰,۰۲۰	۰,۰۱۹	۰,۰۲۰	۰,۰۳۰	۰	۰	۰
quantitative housing	۰	۰	۰,۰۲۳	۰,۰۲۳	۰,۰۲۳	۰,۰۱۹	۰,۰۱۹	۰,۰۱۸	۰,۰۱۷	۰,۰۱۷	۰	۰	۰	۰
quantitative housing	۰	۰	۰,۰۲۲	۰,۰۲۲	۰,۰۲۲	۰,۰۱۸	۰,۰۱۸	۰,۰۱۸	۰,۰۱۸	۰,۰۱۹	۰	۰	۰	۰

Table 7. Binary comparison sub matrix of each of the main criteria

E_{ij} =	access quality	distance to metropolis	water	electricity	gas	road	services and employment	industries and employment	social diversity	population absorption	quantitative services	quantitative services	quantitative housing	quantitative housing
Golbahar	0.833	0.875	0.833	0.500	0.500	0.500	0.875	0.333	0.750	0.833	0.750	0.833	0.875	0.875
Binalud	0.167	0.125	0.167	0.500	0.500	0.500	0.125	0.667	0.250	0.167	0.250	0.167	0.125	0.125

Table 8. Preferred of alternatives in relation to the sub-criteria

	Target	Clusters Main criteria	Sub-criteria
Target	0	0	0
Main criteria =w	W_{21}	W_{22}	0
Sub-criteria	0	W_{32}	W_{33}

Table 9. not weighted super-matrix

9. Forming weighted super matrix

Now, not weighted super-matrix should be converted to weighted super-matrix, that is, the matrix the sum of its column is 1. To convert not weighted super-matrix to weighted super-matrix, one should multiply not weighted super-matrix in the cluster matrix. The cluster matrix reflects the contribution of each cluster to achievement of the objectives of the study. Cluster Matrix is obtained from binary comparison of clusters within framework of structure of super-matrix (not weighted). According to the proposition of Saaty, to obtain the relative importance of clusters in the super matrix (not weighted), it is necessary to calculate the cluster matrix so that the column clusters are considered as control elements. In other words, non-zero column clusters of the original super matrix (not weighted) undergo binary comparison with regard to other clusters located in that column, to obtain the importance vector of each of the column clusters, and finally putting together importance vector of each cluster, cluster matrix is achieved. It is seen from the structure of super matrix of this study that these clusters must be examined with sub-criteria cluster s only in column cluster related to "main criteria". As a result, the cluster matrix shown in Table 10 is obtained.

10- Calculation of weighted super-matrix

However, to obtain the weighted super-matrix, each element of column clusters of not weighted super matrix column must be multiplied by relative importance of that cluster (of the cluster matrix). Weighted super-matrix is obtained is random /probabilistic, tha is, its column sum is equal to one. weighted super-matrix of this study is presented in Table 12.

11. Calculation of the limit super matrix

The purpose of calculation of limit of weighted super-matrix is to obtain the relative influence of each element on others. For divergence of importance factor of each of elements of super-matrix, it is raised to a power of k, which is an arbitrary large number k, until all super matrix elements are identical (become equal). This is done by repetition. In this case, the limit super matrix is obtained. In this study, at power of 600 of weighted super-matrix, the limit super-matrix is obtained with all the elements nearly equal (Table 13)

It should be noted that elements of the super matrix should be normalized obtain to random/ probabilistic mode (sum of a column must be equal to 1); for this purpose, individual values is divided by the column sum of values. The ultimate importance vector ( ) was presented in normalized form the purposes of this study:

Table 10. *Not weighted super matrix*

		Target	Main criteria						Sub-criteria													
			access	infrastructure	activity	social-demographic	services	housing	access quality	distance to metropolis	water	electricity	gas	road	services and employment	industries and employment	social diversity	population absorption	quantitative services	quantitative services	quantitative housing	quantitative housing
Target	Target	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
Main criteria	access	٠,١٣١	.	٠,٢٣٦	٠,١٢٦	٠,٢١٨	٠,١٨٢	٠,١٧٢	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	infrastructure	٠,٤٠٥	٠,٤٦٧	٠	٠,٤٨٣	٠,٤٥٣	٠,٤٥٨	٠,٤١٨	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	activity	٠,١٨٤	٠,٢٤٤	٠,٣٢١	٠	٠,١٩٦	٠,١٥٠	٠,١٩٢	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	social-demographic	٠,١٨٥	٠,١٣٩	٠,٣٣٥	٠,٢١٦	٠	٠,١٦٢	٠,١٧٦	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	services	٠,٠٥٦	٠,٠٩١	٠,٠٦٦	٠,١٠٨	٠,٠٨١	٠	٠,٤٣	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	housing	٠,٠٣٩	٠,٠٥٨	٠,٠٤٢	٠,٠٦٧	٠,٠٥١	٠,٠٤٨	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
Sub-criteria	access quality	٠	٠,٣٣٣	٠	٠	٠	٠	٠	٠	٠,١٩٣	٠	٠	٠	٠,١٣٩	٠,١٣٧	٠,١٣٦	٠,١٣٤	٠,١٣٦	٠	٠	٠	٠
	distance to metropolis	٠	٠,٦٦٧	٠	٠	٠	٠	٠	٠,١٥٥	٠	٠,٠٩٠	٠,٠٩٠	٠,٠٩٠	٠,٠٨٢	٠,٠٨١	٠,٠٨٠	٠,٠٧٩	٠,٠٨١	٠	٠	٠	٠
	water	٠	٠	٠,٢٥٠	٠	٠	٠	٠	٠	٠,١٤٣	٠	٠,١٧٦	٠,١٧٦	٠,١٤٢	٠,١٣٩	٠,١٣٨	٠,١٣٩	٠,١٣٩	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	electricity	٠	٠	٠,٢٥٠	٠	٠	٠	٠	٠	٠,١٤٣	٠,١٧٦	٠	٠,١٧٦	٠,١٤٢	٠,١٣٩	٠,١٣٨	٠,١٣٩	٠,١٣٩	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	gas	٠	٠	٠,٢٥٠	٠	٠	٠	٠	٠	٠,١٤٣	٠,١٧٦	٠,١٧٦	٠	٠,١٤٢	٠,١٣٩	٠,١٣٨	٠,١٣٩	٠,١٣٩	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	road	٠	٠	٠,٢٥٠	٠	٠	٠	٠	٠,٤١٢	٠,١٤٣	٠,١٧٦	٠,١٧٦	٠,١٧٦	٠	٠,٠٨٦	٠,٠٨٧	٠,٠٨٥	٠,٠٨٥	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	services and employment	٠	٠	٠	٠,٣٣٣	٠	٠	٠	٠,١١٧	٠,٠٥٣	٠,٠٧٨	٠,٠٧٨	٠,٠٧٨	٠,٠٦٥	٠	٠,٠٦٣	٠,٠٥٧	٠,٠٥٧	٠,٠٧١	٠,٠٧١	٠,٠٥٨	٠,٠٥٨
	industries and employment	٠	٠	٠	٠,٦٦٧	٠	٠	٠	٠,١٣٤	٠,٠٥٧	٠,٠٨٧	٠,٠٨٧	٠,٠٨٧	٠,٠٧١	٠,٠٦٣	٠	٠,٠٦٣	٠,٠٦٣	٠,٠٨١	٠,٠٨١	٠,٠٦٨	٠,٠٦٨
	social diversity	٠	٠	٠	٠	٠,١٦٧	٠	٠	٠,٠٣٠	٠,٠١٩	٠,٠٣٣	٠,٠٣٣	٠,٠٣٣	٠,٠٢٧	٠,٠٣٠	٠,٠٣٦	٠	٠,٠٨٤	٠,٠٢٩	٠,٠٢٩	٠,٠٢٥	٠,٠٢٥
	population absorption	٠	٠	٠	٠	٠,٨٣٣	٠	٠	٠,١٥٣	٠,١٠٤	٠,٠٩٠	٠,٠٩٠	٠,٠٩٠	٠,١١٠	٠,١٠٧	٠,١٠٦	٠,٠٩١	٠	٠,٠٥٠	٠,٠٥٠	٠,٠٤٢	٠,٠٤٢
	quantitative services	٠	٠	٠	٠	٠	٠,٦٦٧	٠	٠	٠	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٢	٠,٠٢٢	٠,٠٢٢	٠,٠٢١	٠,٠٢٢	٠	٠,٠٣٠	٠	٠
	quantitative services	٠	٠	٠	٠	٠	٠,٣٣٣	٠	٠	٠	٠,٠٢٤	٠,٠٢٤	٠,٠٢٤	٠,٠٢٠	٠,٠٢٠	٠,٠٢٠	٠,٠١٩	٠,٠٢٠	٠,٠٣٠	٠	٠	٠
	quantitative housing	٠	٠	٠	٠	٠	٠	٠,٥٠٠	٠	٠	٠,٠٢٣	٠,٠٢٣	٠,٠٢٣	٠,٠١٩	٠,٠١٩	٠,٠١٨	٠,٠١٧	٠,٠١٧	٠	٠	٠	٠
	quantitative housing	٠	٠	٠	٠	٠	٠	٠,٥٠٠	٠	٠	٠,٠٢٢	٠,٠٢٢	٠,٠٢٢	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٩	٠	٠	٠	٠

Table 10. Not weighted super matrix

Eigen vector (w)	-۲Sub-criteria	-۱Main criteria	Clusters
0.667	2	1	Main criteria
0.333	1		Sub-criteria

Table 10. Binary comparison of clusters

	Clusters		
	Target	Main criteria	Sub-criteria
Target	0	0	0
Main criteria	1	0.667	0
Sub-criteria	0	0.333	1

Table 11. Initial cluster matrix

According to the ultimate importance vector ( ), sub-criterial of water and electricity, gas, roads, industry and services and employment, and quality of access had the the highest importance and thus had the greatest impact on the formation of new cities studied.

12 - selecting successful alternative:

To select the more successful alternative, the proposed relationship of Lin et al. was used as described below:

$$D_{I=}\sum_{J=1}^{J} W_J E_{IJ}$$

where in:

D_I : Site I utility index,

W_J : The relative importance of sub-criteria J (derived from the super matrix)

E_{IJ}: Ranking of site I in terms of sub-criteria j (matrix)

Utility of sites was calculated using the above equation, and the results are presented in last row of Table 15 having determined ranking. The results show that after setting out both the cities of Binalud and Golbahar, City of Golbahar with score (0.651) was in the first place.

In this section, ANP was to evaluate and prioritize the factors affecting the realization of the land use objectives of the new suburbs of major cities of Mashhad. In addition to the prioritization of criteria, this technique also shows us which of the two alternatives in achieving the objectives defined for land use planning have been more successful (here meaning new towns of Golbahar and Binalood). The results of this technique shows that among the proposed measures, infrastructure, water, electricity and gas have the highest scores, because basically these settlements is one of the most important needs and due the lack of necessary infrastructure, lack of population and activity will follow. Among other studied criteria, employment, population and access quality were of almost equal importance and can be all on one level and was of secondary importance. These criteria are indicative of the same weight, which indicates these cases each is essential to one another and the success of each of them will lead to the success of others. It is clear that employment can increase population and employment is also caused by population, and both realize in case access is quick and convenient to the metropolis. Finally, according to the investigations carried out in connection with the performance of new towns of Golbahar and Binalood, as for the criteria of

Target			Main criteria						Sub-criteria													
			access	infrastructure	activity	social-demographic	services	housing	access quality	distance to metropolis	water	electricity	gas	road	services and employment	industries and employment	social diversity	population absorption	quantitative services	quantitative services	quantitative housing	quantitative housing
Target	Target	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
Main criteria	access	٠,١٣١	٠	٠,١٥٧	٠,٠٨٤	٠,١٤٥	٠,١٢١	٠,١١٥	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	infrastructure	٠,٤٠٥	٠,٣١١	٠	٠,٣٢٢	٠,٣٠٢	٠,٣٠٥	٠,٢٧٩	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	activity	٠,١٨٤	٠,١٦٣	٠,٢١٤	٠	٠,١٣١	٠,١٠٠	٠,١٢٨	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	social-demographic	٠,١٨٥	٠,٠٩٣	٠,٢٢٣	٠,١٤٤	٠	٠,١٠٨	٠,١١٧	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	services	٠,٠٥٦	٠,٠٦١	٠,٠٤٤	٠,٠٧٢	٠,٠٥٤	٠	٠,٢٨٧	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	housing	٠,٠٣٩	٠,٠٣٩	٠,٠٢٨	٠,٠٤٥	٠,٠٣٤	٠,٠٣٢	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
Sub-criteria	access quality	٠	٠,١١١	٠	٠	٠	٠	٠	٠	٠,١٩٣	٠	٠	٠	٠,١٣٩	٠,١٣٧	٠,١٣٦	٠,١٣٤	٠,١٣٦	٠	٠	٠	٠
	distance to metropolis	٠	٠,٢٢٢	٠	٠	٠	٠	٠	٠,١٥٥	٠	٠,٠٩٠	٠,٠٩٠	٠,٠٩٠	٠,٠٨٢	٠,٠٨١	٠,٠٨٠	٠,٠٧٩	٠,٠٨١	٠	٠	٠	٠
	water	٠	٠	٠,٠٨٣	٠	٠	٠	٠	٠	٠,١٤٣	٠	٠,١٧٦	٠,١٧٦	٠,١٤٢	٠,١٣٩	٠,١٣٨	٠,١٣٩	٠,١٣٩	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	electricity	٠	٠	٠,٠٨٣	٠	٠	٠	٠	٠	٠,١٤٣	٠,١٧٦	٠	٠,١٧٦	٠,١٤٢	٠,١٣٩	٠,١٣٨	٠,١٣٩	٠,١٣٩	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	gas	٠	٠	٠,٠٨٣	٠	٠	٠	٠	٠	٠,١٤٣	٠,١٧٦	٠,١٧٦	٠	٠,١٤٢	٠,١٣٩	٠,١٣٨	٠,١٣٩	٠,١٣٩	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	road	٠	٠	٠,٠٨٣	٠	٠	٠	٠	٠,٤١٢	٠,١٤٣	٠,١٧٦	٠,١٧٦	٠,١٧٦	٠	٠,٠٨٦	٠,٠٨٧	٠,٠٨٥	٠,٠٨٥	٠,١٨٥	٠,١٨٥	٠,٢٠٢	٠,٢٠٢
	services and employment	٠	٠	٠	٠,١١١	٠	٠	٠	٠,١١٧	٠,٠٥٣	٠,٠٧٨	٠,٠٧٨	٠,٠٧٨	٠,٠٦٥	٠	٠,٠٦٣	٠,٠٥٧	٠,٠٥٧	٠,٠٧١	٠,٠٧١	٠,٠٥٨	٠,٠٥٨
	industries and employment	٠	٠	٠	٠,٢٢٢	٠	٠	٠	٠,١٣٤	٠,٠٥٧	٠,٠٨٧	٠,٠٨٧	٠,٠٨٧	٠,٠٧١	٠,٠٦٣	٠	٠,٠٦٣	٠,٠٦٣	٠,٠٨١	٠,٠٨١	٠,٠٦٨	٠,٠٦٨
	social diversity	٠	٠	٠	٠	٠,٠٥٦	٠	٠	٠,٠٣٠	٠,٠١٩	٠,٠٣٣	٠,٠٣٣	٠,٠٣٣	٠,٠٢٧	٠,٠٣٠	٠,٠٣٦	٠	٠,٠٨٤	٠,٠٢٩	٠,٠٢٩	٠,٠٢٥	٠,٠٢٥
	population absorption	٠	٠	٠	٠	٠,٢٧٧	٠	٠	٠,١٥٣	٠,١٠٤	٠,٠٩٠	٠,٠٩٠	٠,٠٩٠	٠,١١٠	٠,١٠٧	٠,١٠٦	٠,٠٩١	٠	٠,٠٥٠	٠,٠٥٠	٠,٠٤٢	٠,٠٤٢
	quantitative services	٠	٠	٠	٠	٠	٠,٢٢٢	٠	٠	٠	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٢	٠,٠٢٢	٠,٠٢٢	٠,٠٢١	٠,٠٢٢	٠	٠,٠٣٠	٠	٠
	quantitative services	٠	٠	٠	٠	٠	٠,١١١	٠	٠	٠	٠,٠٢٤	٠,٠٢٤	٠,٠٢٤	٠,٠٢٠	٠,٠٢٠	٠,٠٢٠	٠,٠١٩	٠,٠٢٠	٠,٠٣٠	٠	٠	٠
	quantitative housing	٠	٠	٠	٠	٠	٠	٠,١٦٧	٠	٠	٠,٠٢٣	٠,٠٢٣	٠,٠٢٣	٠,٠١٩	٠,٠١٩	٠,٠١٨	٠,٠١٧	٠,٠١٧	٠	٠	٠	٠
	quantitative housing	٠	٠	٠	٠	٠	٠	٠,١٦٧	٠	٠	٠,٠٢٢	٠,٠٢٢	٠,٠٢٢	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٩	٠	٠	٠	٠

Table 12: Weighted super-matrix

Target			Main criteria						Sub-criteria													
			access	infrastructure	activity	social-demographi	services	housing	access quality	distance to metropolis	water	electricity	gas	road	services and employment	industries and employment	social diversity	population absorption	quantitative services	quantitative services	quantitative housing	quantitative housing
Target	Target	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
Main criteria	access	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	infrastructure	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	activity	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	social-demographic	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	services	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
	housing	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
Sub-criteria	access quality	٠,١١٠	٠,١١٠	٠,١٠٩	٠,١١٠	٠,١٠٩	٠,١٠٩	٠,١٣٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٠٧
	distance to metropolis	٠,٠٨١	٠,٠٨٠	٠,٠٨٠	٠,٠٨٠	٠,٠٨٠	٠,٠٨٠	٠,١٠٠	٠,٠٧٩	٠,٠٧٩	٠,٠٧٩	٠,٠٧٩	٠,٠٧٩	٠,٠٧٩	٠,٠٧٩	٠,٠٧٩	٠,٠٧٨	٠,٠٧٩	٠,٠٧٩	٠,٠٧٩	٠,٠٧٨	٠,٠٧٩
	water	٠,٢٧٧	٠,٢٧٦	٠,٢٧٤	٠,٢٧٦	٠,٢٧٥	٠,٢٧٥	٠,٣٤٤	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٧٠	٠,٢٧٠	٠,٢٧٠	٠,٢٦٩	٠,٢٦٩
	electricity	٠,٢٧٧	٠,٢٧٥	٠,٢٧٤	٠,٢٧٥	٠,٢٧٥	٠,٢٧٥	٠,٣٤٤	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٨	٠,٢٦٩	٠,٢٦٩	٠,٢٦٩	٠,٢٦٨	٠,٢٦٩
	gas	٠,٢٦٣	٠,٢٦٢	٠,٢٦١	٠,٢٦٢	٠,٢٦١	٠,٢٦١	٠,٣٢٧	٠,٢٥٦	٠,٢٥٦	٠,٢٥٦	٠,٢٥٦	٠,٢٥٦	٠,٢٥٦	٠,٢٥٥	٠,٢٥٥	٠,٢٥٥	٠,٢٥٦	٠,٢٥٦	٠,٢٥٦	٠,٢٥٥	٠,٢٥٦
	road	٠,٢٤٣	٠,٢٤١	٠,٢٤٠	٠,٢٤١	٠,٢٤٠	٠,٢٤٠	٠,٣٠١	٠,٢٣٥	٠,٢٣٥	٠,٢٣٥	٠,٢٣٥	٠,٢٣٥	٠,٢٣٥	٠,٢٣٥	٠,٢٣٥	٠,٢٣٥	٠,٢٣٦	٠,٢٣٦	٠,٢٣٦	٠,٢٣٥	٠,٢٣٥
	services and employment	٠,١٠٦	٠,١٠٥	٠,١٠٤	٠,١٠٥	٠,١٠٥	٠,١٠٥	٠,١٣١	٠,١٠٢	٠,١٠٢	٠,١٠٢	٠,١٠٢	٠,١٠٢	٠,١٠٣	٠,١٠٢	٠,١٠٢	٠,١٠٢	٠,١٠٣	٠,١٠٣	٠,١٠٣	٠,١٠٢	٠,١٠٢
	industries and employment	٠,١١٩	٠,١١٨	٠,١١٨	٠,١١٨	٠,١١٨	٠,١١٨	٠,١٤٨	٠,١١٦	٠,١١٦	٠,١١٦	٠,١١٦	٠,١١٦	٠,١١٦	٠,١١٦	٠,١١٦	٠,١١٥	٠,١١٦	٠,١١٦	٠,١١٦	٠,١١٥	٠,١١٦
	social diversity	٠,٠٥٨	٠,٠٥٨	٠,٠٥٨	٠,٠٥٨	٠,٠٥٨	٠,٠٥٨	٠,٠٧٢	٠,٠٥٧	٠,٠٥٧	٠,٠٥٧	٠,٠٥٧	٠,٠٥٧	٠,٠٥٧	٠,٠٥٦	٠,٠٥٦	٠,٠٥٦	٠,٠٥٧	٠,٠٥٧	٠,٠٥٧	٠,٠٥٦	٠,٠٥٧
	population absorption	٠,١٠٨	٠,١٠٧	٠,١٠٦	٠,١٠٧	٠,١٠٧	٠,١٠٧	٠,١٣٣	٠,١٠٤	٠,١٠٤	٠,١٠٤	٠,١٠٤	٠,١٠٤	٠,١٠٤	٠,١٠٤	٠,١٠٤	٠,١٠٤	٠,١٠٥	٠,١٠٥	٠,١٠٥	٠,١٠٤	٠,١٠٤
	quantitative services	٠,٠٣٠	٠,٠٣٠	٠,٠٣٠	٠,٠٣٠	٠,٠٣٠	٠,٠٣٠	٠,٠٣٧	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩	٠,٠٢٩
	quantitative services	٠,٠٢٨	٠,٠٢٨	٠,٠٢٧	٠,٠٢٨	٠,٠٢٨	٠,٠٢٨	٠,٠٣٤	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧	٠,٠٢٧
	quantitative housing	٠,٠١٨	٠,٠١٨	٠,٠١٧	٠,٠١٨	٠,٠١٨	٠,٠١٧	٠,٠٢٢	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧	٠,٠١٧
	quantitative housing	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠٢٢	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨	٠,٠١٨

Table 12: Weighted super-matrix

		Target
W_{ANP} =	access quality	0.064
	distance to metropolis	0.047
	water	0.160
	electricity	0.160
	gas	0.152
	road	0.140
	services and employment	0.061
	industries and employment	0.069
	social diversity	0.034
	population absorption	0.062
	quantitative services	0.017
	quantitative services	0.016
	quantitative housing	0.010
	quantitative housing	0.010

Table 14. Ultimate importance vector of the sub-criteria

population, work, housing, services and infrastructure available, and the privileges that each of the new towns studied earned with respect to the criteria and sub-criteria defined in the study, New Town of Golbahar with utility index of 0.651 is in the first place. This means that New Town of Golbahar have been more successful than the city of New Binalood in achieving the objectives set for it. Or in other words, it has a more effective land use planning role in the urban complex of Mashhad and in relation to Mashhad metropolitan city.

Conclusion

For the purposes of the study, first, the city of Mashhad and the need to create new towns were studied and then we identified and evaluated the performance of new towns of Golbahar and Binalood in terms of the objectives envisaged in the master plan. Given the limited resources of the city of Mashhad and inability to deploy all future population within the continuous range on the one hand and heading of the population for various reasons to the periphery of the city and the development of marginal settlement on the other hand, with the aim of decentralization of the metropolitan city of Mashhad, Golbahar and Binalood as two new towns were built on the outskirts of the city. But despite the potential and possibilities of new towns outside metropolitan Mashhad, unfortunately, these cities not only were deprived of serious and influential support in the past two decades for the development process but also some even some of the orders and decrees contrary to the development of them were issued and executed. In

criteria	Sub-criteria	W_j	E_{IJ}		$W_j E_{IJ}$	
			Golbahar	Binalud	Golbahar	Binalud
access	access quality	**0.064**	**0.833**	**0.167**	**0.053**	**0.011**
	distance to metropolis	**0.047**	**0.875**	**0.125**	**0.041**	**0.006**
infrastructure	water	**0.160**	**0.833**	**0.167**	**0.133**	**0.027**
	electricity	**0.160**	**0.5**	**0.5**	**0.080**	**0.080**
	gas	**0.152**	**0.5**	**0.5**	**0.076**	**0.076**
	road	**0.140**	**0.5**	**0.5**	**0.070**	**0.070**
activity	services and employment	**0.061**	**0.875**	**0.125**	**0.053**	**0.008**
	industries and employment	**0.069**	**0.333**	**0.667**	**0.023**	**0.064**
social-demographic	social diversity	**0.034**	**0.75**	**0.25**	**0.026**	**0.009**
	population absorption	**0.062**	**0.833**	**0.167**	**0.052**	**0.010**
services	quantitative services	**0.017**	**0.75**	**0.25**	**0.013**	**0.004**
	quantitative services	**0.016**	**0.833**	**0.167**	**0.013**	**0.003**
housing	quantitative housing	**0.010**	**0.875**	**0.125**	**0.009**	**0.001**
	quantitative housing	**0.10**	**0.875**	**0.125**	**0.009**	**0.001**
$D_I = \sum_{J=1}^{J} W_J E_{IJ}$					0.651	0.351

Table 15. Calculation of utility index of cities in question

the field study, previous residence, previous ownership, the reasons for migration to new towns, level of satisfaction and tendency for households living in the cities of New Cities of Golbahar and Binalood were investigated and the results indicate that:

Previous residence of the vast majority of migrants of new towns was Mashhad. The most important reasons for migration of households were cheap land and housing and employment opportunities; in terms of performances, the New Towns of Golbahar and Binalood have failed to achieve their initial goals. To create new cities, we need job creation to keep population absorbed. In this regard, the studies found that more than half the residents of Golbahar work outside of the city. The residents' satisfaction is low. In Golbahar, only 17 percent of residents have satisfaction. This rate is 32% in Binalood, and this is because part of the city's immigrants are native to this area. Therefore, a significant percentage of the population have no intention to remain in the cities and will move to the city of Mashhad if possible.

Overall, it can be said that although these cities have been successful in providing housing, and most people attracted are from the city of Mashhad, they are far from land use planning targets set for them.

Finally, according to the investigations carried out in connection with the performance of new towns of Golbahar and Binalood, as for the criteria of population, work, housing, services and infrastructure available, and the privileges that each of the new towns studied earned with respect to the criteria and sub-criteria defined in the study, New Town of Golbahar with utility index of 0.651 is in the first place. This means that New Town of Golbahar have been more successful than the city of New Binalood in achieving the objectives set

مدیریت شهری
فصلنامه مدیریت شهری
(ضمیمه لاتین)
Urban Management
No.46 Spring 2017

for it. Or in other words, it has a more effective land use planning role in the urban complex of Mashhad and in relation to Mashhad metropolitan city.

References

Bazi and Afrasiabi (2009), Measuring and evaluating the effectiveness and efficiency of new towns, Sadra, Journal of Urban and Regional Studies and Research

A Group of Consulting Engineers, (1992), Studies of new cities in the world, the fourth section, Tehran, New Towns Development Corporation.

Ziyari, K. (2009), "Principles and methods of regional planning", Second Edition, Tehran University Press.

Plan and Budget Organization, (11985), Basic design of land use plan, Tehran

Binalood New Town Development Company, (2012), in New Binalood brochure.

Golbahar New Town Development Company (2012), Bureau of Statistics, Information and Control of project, Golbahar

Sehat, S. and Parizadi, I. (2009), Employing techniques of analytic network process to analyze strengths, weaknesses, opportunities and threats, Journal of Industrial Management, 1(2).

Ghazi, I. (1991), concept of land use and its relationship with geographical analysis of the development, collection

Farid, Y, (1999), Geography and urbanism, Tabriz University Press.

Kazemi, M. (1997), Evaluating the role of new towns, New towns Seminar Proceedings, Isfahan, New Towns Development Corporation

Mozayyeni, M., (1994), Articles on the city and urban development, Publishing and Printing Institute of University of Tehran

Mozayyeni, M. (1984), Persian Culture (Vol. 1), Amir Kabir, Tehran.

European Institute of New Towns (2003), New Cities Book 1 (Proceedings, H. Chizari), New Towns Development Company.

Naderi, E. and Seif Naraqi, M. (1996), Research methods and the evaluation methods in humanities, Badr Office of Research and Publications, Tehran.

Nuri Kermani, A. (1995), Functional analysis of new towns in Iran, Sepehr Journal. (14).