International Journal of Architecture and Urban Development
Vol.2, No4, Autumn 2012

Evaluation of the Urban Settlement' s Optimal System

(Hamadan Province)

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Received 09.04.2012; Accepted 23.07.2012

ABSTRACT: In developing countries, the domination of peripheral and dependent capitalism relations and the lack of appropriate structures and channels of attracting, this system have caused some kind of spatial-anatomic unbalances that has resulted in the appearance of single cities with national and regional prevalence. This situation is the main reason for small, medium and intermediate cities to lose their role in the third-world countries and, therefore, for some kind of urban network to appear having consequences, especially at regional scales, like the deceleration or, in some cases, the stop of the dispersion of the expected effects of development and the lack of a chain or network of settlement focuses connecting the settlement system of the region together. The presented work has been planned to focusing on the study and analysis of the urban system of Hamadan province, Iran, with aims to present an appropriate pattern for mentioned province according to the common models and techniques of urban system analyses and methods. Results showed that currently the urban system of Hamadan province is unbalanced; however, the analysis of this system at a regional scale could be useful in regional development management and planning. Nevertheless, it is necessary that the urban system is considered in relation to neighbor regions and national space and in systematic terms. Finally, improvement of systematic viewpoints in planning for urban system and Location and leveling of new activities and settlement areas are recommended to be implemented in coincidence with the suggested urban system.

Keywords: *Urban System, Factor Analysis, Cluster Analysis, Analytic Hierarchy Process.*

INTRODUCTION

In the current epoch that the whole world is approaching towards urbanism and cities are emerging as contexts for the presence of humans and the manifestation of their talents and activities, studying the system of cities seems to be necessary. On account of the urbanization growth rate and therefore the development of urban life specially in the third world countries, and consequently in Iran, in the recent years, cities as population focuses have hosted a high rate of human population in themselves so that, for example, the urban population of Iran has increased from 39% to 70% between 1966 and 2006. With this explanation and taking account of the importance of the contemporary economy and the inevitably interactive and systematic relations of cities, it is evident that obtaining a logical classification regarding these systematic relations is necessary. This classification, in terms of different quantitative and qualitative criteria, leads to a ranked system literally known as hierarchy. Therefore, studying hierarchy systems reveals the interactions among residency systems and the type and amount of their relations so as to understand and try to resolve the dysfunctions existing in the urban system and increase the dynamism of the spatial system. This study, "investigating the urban system of Hamadan province and analyzing its relations and interrelations", aims to gain an understanding of the hierarchical type and the elements playing role in the construction of such a system.

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Literature Review

Different studies have been done on the analysis and evaluation of urban network and urban settlements system at regional scales, a number of which relevant to the present study will be pointed out in summary in the following. Giti Etemad has investigated Iran's urban network in detail in a study titled Urban Network in Iran in 1984. She shows that the galactic pattern of urban network in Iran has approached to a chain pattern in 50 years between 1921 and 1976. Its reasons are assumed to be turning to capitalist economy and consumption culture, the loss of the erstwhile tuned relation between urban and rural regions, and the increasing structural dependence on international capitalism (Etemad, 1984). Behforouz (1992) in *A Theoretical-Experimental Analysis for Balancing the Spatial Distribution of Population in Iran's Urban Systems*, according to the theoretical studies carried out about urban systems in under-development countries like India, Turkey, Pakistan, analyzes the specific situation of urban system in Iran and finally introduces a modified form of the rank-size rule for the prediction of population in under-development countries like Iran that enjoy the phenomenon of urban primacy. Rafeian (1996) concentrating on urban systems and using the results of previous studies, presents a historical analysis of variation in spatial system of Iran's urban network in general and Isfahan's in specific. Hajipour (2003), also, studying the optimal urban system in Khuzestan province and examining the considered methods in urban systems and regional studies,

presents a population and functional analysis of the counties of this province. As to the experiences of other countries in studying and analyzing urban systems, the focus of our study is on viewpoints and theories based on the hierarchical system of settlements. These theories are considered in terms of two prominent attitudes at an international scale: 1. emphasizing traditional attitudes, the presence and survival of the focus pattern like growth pole is considered as a necessary requirement for the historical variation of development process, and the flow of populations towards premier focuses and their economic development are analyzed in such terms (Rosen and Resnick, 1980). 2. Economic-political viewpoint, by using the historical coincidence of development and modernization processes in undeveloped countries similar to that in present developed countries, assumes the emergence of urban primacy and growth focus as a significant sign of dependence and analyzes it in terms of global system of domination, commercial dependence, world trade investments, political, sociological, and economic brands, and insists more on decentralization from premier focuses (Deicnmann and Henderson,2000; Masumi Eshkevari,2006).

Derived theories from these viewpoints include two general cases: That is the most important principle among urban hierarchy system theories and is derived from the central place theory that has been considered by Christaller (Bourne and Simons, 1978; Berry and Horton, 1971;Hajipoor, 2003). According to this theory, generally those places are assumed central that production activities are concentrated on, in order for commodity production and service supply. The degree of the centrality of every city is determined by its rank so that the cities ranked high have higher populations, larger sphere of influence, and higher amount and diversity of productive activities and also the commodities with a higher grade of production scale or marketplace belong to this level, while, on the other hand, cities with a lower rank are centers for supplying the commodities and services that answer to the basic needs of people that should be provided and purchased daily. Thus, every society has a urban hierarchy because, the marker breadth is different for diverse commodities and services that it is caused by the crescendo and diminuendo that the market breadth of every commodity and service does have (Kalantari, 2001).

Theories that try to present rules or models for the sizes of urban settlements. Works of researchers like Orbach, Ziff, Berry, and Richardson are mentionable in this field (Hajipoor, 2005). Present study also, tries to gain a functional analysis of the urban system of Hamadan Province according to Behfrouz's modified rank-size model and by means of settlements hierarchy theories, as well as presenting a morphological analysis of urban focuses.

MATERIALS AND METHODS

Assumptions

According to the wills of the study and the preferred theoretical framework (i.e. rank-size rule, the modified model of rank-size, functional analysis based on the settlement hierarchy system theories) the assumptions of the study are presented as the following:

Urban settlement system of Hamadan province seems not to be balanced currently and- so the rank-size rule to be a good choice for designing the optimal urban system in this province. Different factors seem to have participated in the design of the current urban system of this province, among which population factors and its related parameters and also economic factors playing more important roles in deciding the urban optimal system and hierarchy of the province.

Hamadan Province

Hamadan province covers an area of approximately 19491 Km^2 in the west of Iran, , lying between latitudes $33\ 59'$ and $35\ 44'$ N and longitudes $47\ 47'$ and $49\ 30'$ E. It has borders with Zanjan and Ghazvin provinces in the north, Lorestan province in the south, Markazi province in the east, and Kermanshah province and a part of Kurdistan province in the west. According to the latest administrative divisions, Hamadan province consists of 8 counties, i.e. Hamadan, Bahar, Razan, Asadabad, Toyserkan, Nahavand, Malayer, and Kabudarahang, 27 settlements, 23 districts, 72 rural districts, and 1085 populated villages (Tahmasebi, 2001).

Study Procedure

In this section, having studied and analyzed different elements and parts of the under-study district,- the researchget providing a morphological analysis (based on population factors) of the urban system of Hamadan province by using linear regression models and the modified rank-size model.

As it is shown in Fig.1, linear model can be an appropriate model for population design, therefore, the researchuse the linear regression method in order to predict the population of urban focuses of Hamadan province. Rank-size model can also be used that due to the existence of urban primacy phenomenon in Iran, the modified rank-size model compared to rank-size model represents relatively more logical results in case of Hamadan province's urban system analysis, because, it not only retains the rank-size relation in the distribution of population in the cities of a certain district but also calculates the percent of quota for each city's population in proportion with the system set of that city (Behforouz, 1992). Modified rank-size formula is composed of the following items:

P_{rth}: population of town at the r^{th} rank;

$\Sigma p_{1\text{-}n}$: sum of the real population of all under-study towns;

R_{rth}: rank of town

Fig.1: Geographical position of Hamadan province

$$prth = \frac{\sum p_{1-n} / R_{rth}}{\sum \frac{1}{R_1} + \frac{1}{R_2} + ... + \frac{1}{R_n}}$$

$$\sum \frac{1}{R_1} + \frac{1}{R_2} + ... + \frac{1}{R_n}$$

: Sum of the rank proportions of all under-study settlements. Therefore, by using the linear regression method and the modified rank-size model, model populations for each of the towns of Hamadan province can be calculated and population shortages or excesses could also be worked out comparing the two models. For instance, the population of Hamadan town, according to the modified rank-size model, was calculated 252030 people that had an excess of 227608. Moreover, the regression model proves to be closer to reality comparing the two exploited models as it is shown in Fig. 3.

Thus, it can be concluded that some settlements of the province are enjoying excess populations by comparison with their service providing capabilities and also, here, the ranking of urban centers of Hamadan province can be discussed that requires functional analyses of Hamadan settlements as well as taking account of some other factors in addition to the present population ones.

Functional analysis of settlement system is a part of the settlement systems analysis that determines the functional properties of settlements, their focuses, and finally the hierarchy and ranking of them. Factor analysis, numerical taxonomy, and cluster analysis could be named as a few of the different methods of settlement systems functional analysis (Hajipoor, 2005). Factor analysis has been used in the present study, which is one of the best techniques of summarizing and defining indices and is capable of eliminating weak indices and ranking and classifying variables in accordance with a certain amount. Apart from factor analysis, cluster analysis has also been used to classify the settlements showing the maximum similarity in terms of respective factors and indices.

Factor Analysis Method and Its Use in the Case of Hamadan Province

Efficiency of indices in the presentation of a model is of high importance so, two prominent points have been tried to be taken into account in their selection: 1. Considered indices to be maximally, more or less, comprehensive and representative of the situation of the under-investigation regions. 2. Because information collection and the statistics required for its analysis must enjoy considerable amounts of formality and reliability, those indices were tried to be used that were accessible through statistical and formal centers, so that the accuracy and validation of the used information could be considerably reliable (Hedayat, 2005). After selecting indices and establishing primary information matrix, due to the existence of differences in the scale of used indices, such scale biases will be removed with the aid of standardization methods specially formula Z, and thus, standardized matrix will be used in factor analysis in the following (Zebardast, 2004). In this study, population and economic indices and also those indicating the housing situation and the public service enjoyment of each city have been used. In factor analysis, after selecting indices and establishing data matrix (Hajipoor, 2003), the scale biases of under-investigation indices are removed by means of a standardization method, then, the formation of factors by using principle component analysis in SPSS software, data standardization by means of formula Z (Kalantari, 2001), and the formation of correlation coefficients matrix for examination of data are carried out. Afterwards, the accuracy of data examinations is verified by Bartlett's test and finally rotated factor matrix is produced. By results of rotated factor matrix, in which the effects of all under 5.0 factor loadings were removed from the factor matrix, the sum of 15 primary indices reduced to 4 factors that the interpretation, related indices, and the naming of each factor is presented in the following. First factor: this factor individually describes 2.39 percent of all variances and has a positively meaningful relation to six variables of city's population in 2006, population rank in

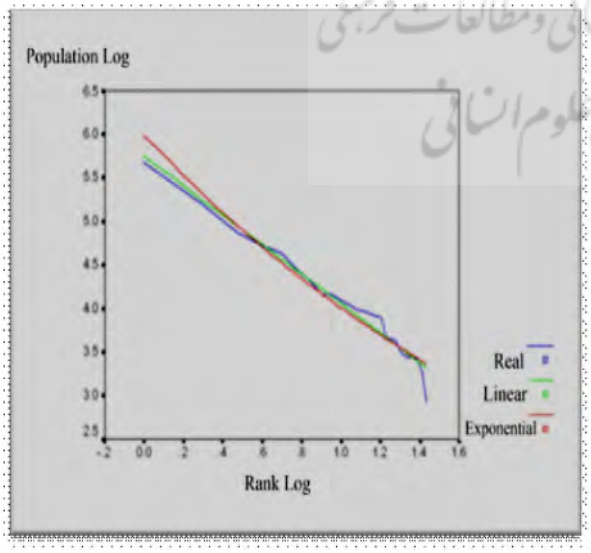

Fig.2: A comparison of linear and exponential models

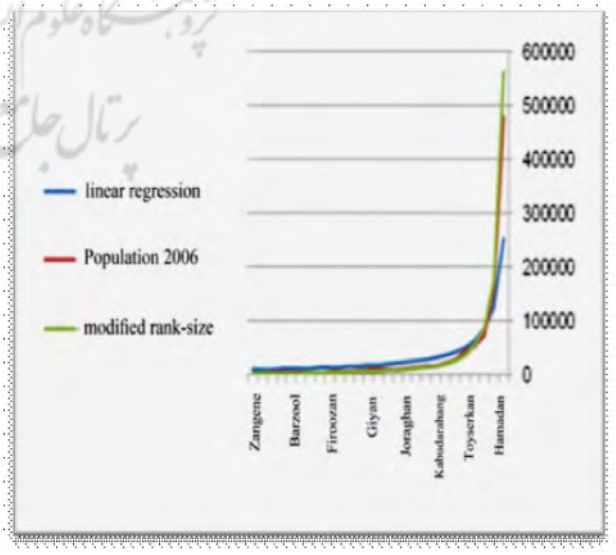

Fig.3: A comparison of the linear regression model and the modified rank-size model

Table 1:Population of Hamadan urban centers according to the linear regression model and the modified rank-size model

City	Population 2006	Rank	Population Log	Rank Log	Linear Regression Models	Shortages or Surpluses	Modified Rank-Size Model	Shortages or Surpluses
Hamadan	479640	1	5.68	0	563637	-83997	252032	+227608
Malayer	156289	2	5.19	0.3	174783	-18494	126016	+30273
Nahavand	73141	3	4.86	0.4	86576	-13435	84011	-10870
Asadabad	51911	4	4.71	0.6	54200	-2289	63008	-11097
Toyserkan	43360	5	4.63	0.6	36685	+6675	50406	-7046
Bahar	27481	6	4.43	0.7	26847	+634	42005	-14524
Kabudarahang	20474	7	4.31	0.8	20429	+45	36004	-15531
Lalehjin	14724	8	4.16	0.9	16807	-2083	31504	-16780
Famenin	14306	9	4.15	0.9	13827	+479	28003	-13698
Razan	12374	10	4.09	1	11376	+998	25203	-12829
Joraghan	10951	11	4.03	1.04	9731	+1220	22912	-11961
Maryanaj	9529	12	3.97	1.07	8325	+1204	21003	-11474
Ghorve Darjazin	9452	13	3.97	1.1	7405	+2047	19387	-9935
Azandariyan	8752	14	3.94	1.1	6335	+2417	18002	-9250
Gian	8065	15	3.90	1.1	5635	+2430	16802	-8773
Salehabad	7850	16	3.89	1.2	5211	+2639	15752	-7902
Serkan	4563	17	3.65	1.2	4636	-73	14825	-10262
Samen	4431	18	3.64	1.2	4123	+308	14002	-9571
Firoozan	4320	19	3.63	1.2	3814	+506	13265	-8945
Damagh	3127	20	3.49	1.3	3527	-400	12601	-9475
Ghahavand	2850	21	3.45	1.3	3262	-412	12001	-9152
Shirin Su	2753	22	3.43	1.3	3017	-264	11456	-8703
Barzool	2731	23	3.43	1.3	2791	-60	10958	-8227
Goltape	2631	24	3.42	1.3	2581	+50	10501	-7870
Jokar	2364	25	3.37	1.3	2387	-23	10081	-7717
Farasfaj	1855	26	3.26	1.4	2296	-441	9693	-7839
Zangene	847	27	2.92	1.4	2123	-1276	9334	-8488

2006, relative population in 2006, the number of garbage trucks, the extent of green space, and the number of fire stations, that can be named as population factor. Second factor: the role of this factor is 24.14 percent in the conceptualization of variances and has meaningful relations to variables like the employment percent in triadic parts of economy, the economically active population percentage, and unemployment rate, and can be called as economical factor. Third factor: This factor explains 56.10 percent of the sum total of variances and is in connection with housing issues and situation. Forth factor: This factor is responsible for the explanation of 82.9 percent of total variances and has stronger relations to town-to-county proportions, growth rate of population focuses, and the economically active population percentage.

Cluster Analysis of the Factor Scores of Urban Settlements and the Presentation of Suggestive Alternatives

In this study, after operating the factor analysis and obtaining the factor scores of urban centers, which are obtained from the coefficient of eigenvalues in the standard matrix, the research have suggested 3 choices for the urban system of the under-study region, using cluster analysis. The investigation of group homogeneity is the subject of cluster analysis. In fact, cluster analysis is a multi-variable analysis trying to organize the information of variables to arrange them in the form of congruent groups or homogenous clusters, constituents of each cluster not similar to those of other clusters. That is, cluster analysis groups towns with the most similarity in factor scores in the same cluster so that they are placed in groups with the least intra-group and the most inter-group differences (Hajipoor, 2005).

Rotated factor scores matrix is required for the implementation of cluster analysis. Taking into account that among 15 under-study indices 4 factors acquired the highest percent of variances and selecting 3 clusters, three different possibilities of cluster analysis will exist according to the combination of the 4 collected factors and the 3 under-study clusters:

First possibility: cluster analysis according to the rank of settlemants from the first factor; Second possibility: cluster analysis according to the final score of settlements from the first and second factors; Third possibility: cluster analysis according to the final score of towns from the four collected factors.

Evaluation of analysis choices is carried out through the analytic hierarchy process (A.H.P) method (Mehdizade, 2007). At this stage, according to the goal of urban system planning, different factors may be exploited such as: growth and development potentials, applicability, and taking account of theoretical hierarchy, political and security issues, and development methods at regional and national scales (Kalantari, 2001). In this evaluation, apart from the three choices produced from cluster analysis method, a fourth choice representative of the ranking of settlements on the basis of centrality index was also considered, but, subsequently the results of hierarchical evaluation indicate that the third choice works better for designing the hierarchical system of

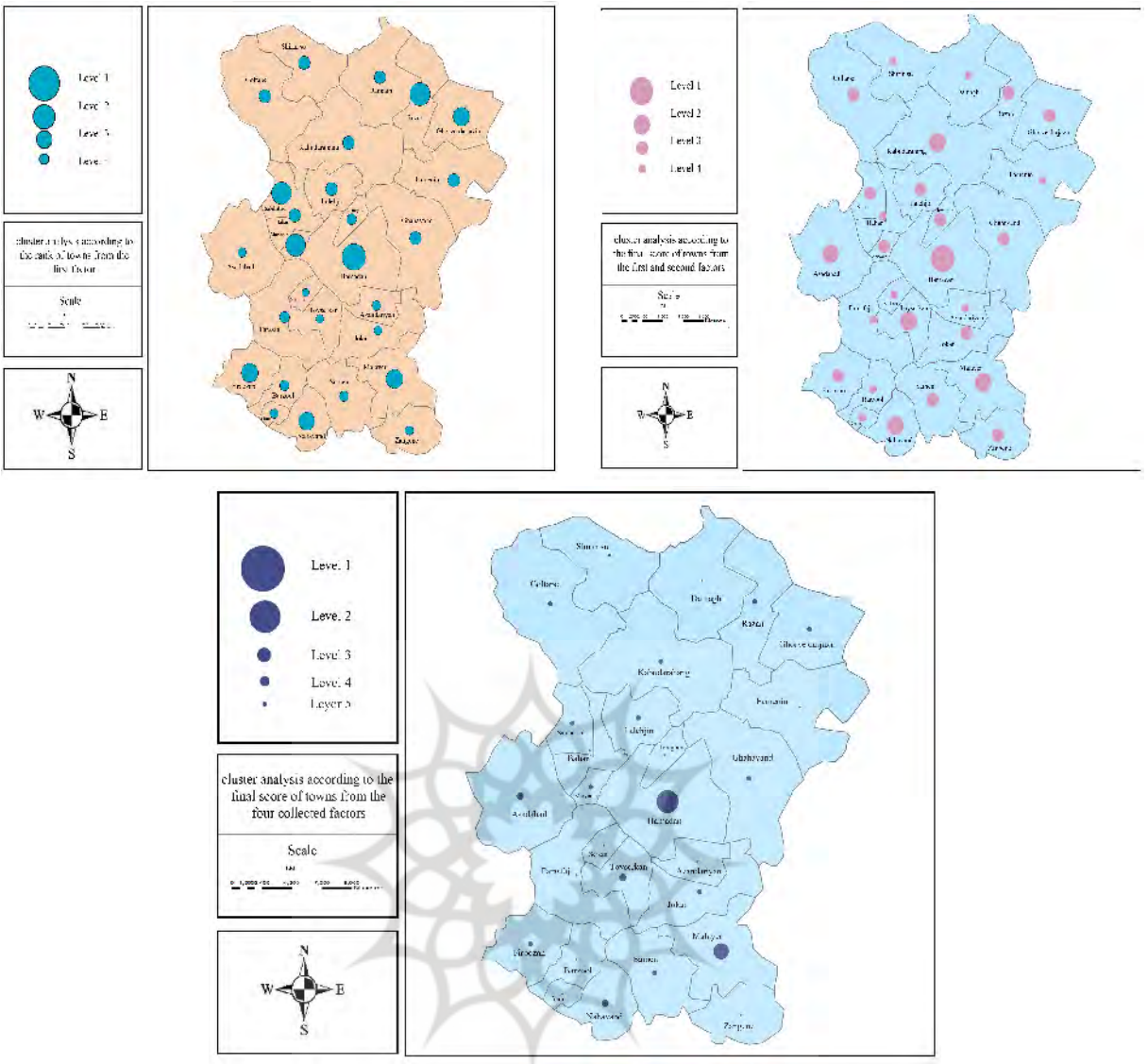

Fig. 4: Leveling of Hamadan's urban centers

settlements in Hamadan province. However, in the service network analysis of Hamadan province, centrality index method, which was used in the regional physical planning of Zagros (Hedayat, 2005), has also been used in addition to the cluster analysis. In this method, a number of primary functions, the hierarchical aspects of which enjoying more transparency, have been selected:

Therefore, according to the results of the population analyses of settlements and the study of urban service-taking system in Hamadan province and taking account of urban planning criteria including upstream plans and application of security, political, and trans-regional issues, Hamadan province's urban system could be imagined as the following:

Level 1: level 1 service center with regional and trans-regional functionality.

Level 2: level 2 populous urban centers, all of which enjoying high populations and comparable to the level 1. In this group, only Malayer city has lied in the south of the province.

Level 3: a mid level containing Asadabad, Toyserkan, and Nahavand cities all lying in the southern half of the province.

Level 4: including Damagh, Shirin Su, Joraghan, Bahar, Azandarian, Serkan, Farsanj, Borzool, Gian, and Zangeneh cities concentrated more in the southern half.

Level 5: Including Qorveh-e Darjazin, Razan, Kabudarahang, Gol Tappeh, Qahavand, Lalejin, Saleh Abad, Maryanaj, Jokar, Samen, Firuzan cities with more concentration in the northern half of the province.

RESULTS AND DISCUSSION

On the basis of the goals of this study being the presentation of an optimal pattern of urban system with emphasize on functional analysis and the situation of primary settlements, the research tried to present a functional analysis of every town in the region by means of analytical methods of urban system and finally to propose an optimal pattern for the urban system of Hamadan province, so that all the future planning works increasingly will be synchronized in support of this urban network.

Balancing the service system and the spatial system elements (population and communities, economic activities, and

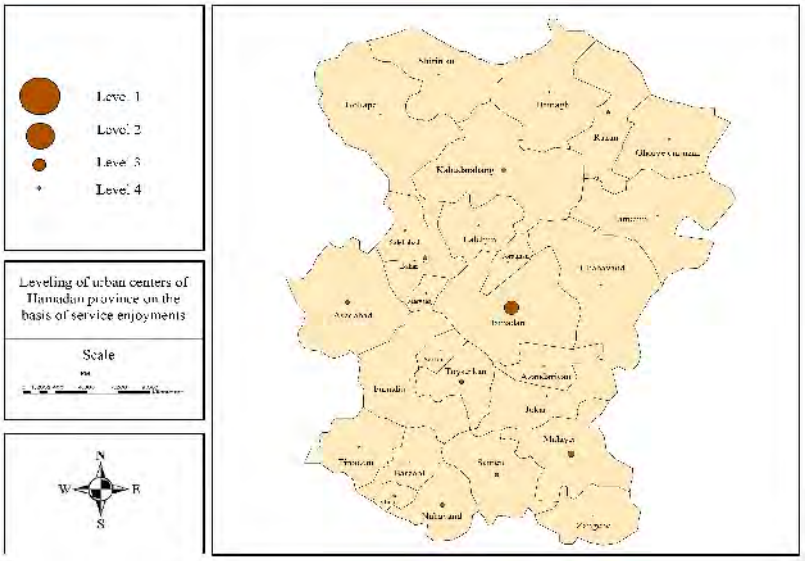

Fig.5: Leveling of urban centers of Hamadan province on the basis of service existence.

Table 2: Selected services for using centrality index method

Services	
Telecommunications services	TX PC SC
Banking Services	Supervision Regional Banks Reserve Grade 1 and 2 Reserve Grade 3 and 4 Reserve Grade 5 and 6
Medical Centers	treatment center City Hospital Areal Hospital Regional Hospital general Hospital
Postal Service	Central Post Office Post Office Independent city post office The town post office Agents Post

communication networks) can be counted as one of the main strategies of the optimal urban system and, in this regard, the determination of the focuses of functional levels, along with developing and supporting communicational axes, and the organization of economic activities and service hierarchy, will necessarily be considered. The process of the migration-between different districts of the country and between rural and urban communities has always been indicative of a one-sided movement from less developed or rural regions towards urban regions, usually in search of better job opportunities, more revenue, education, high-quality and more diverse services, and on the whole a higher quality of life. This phenomenon can be seen almost in all under-development countries, an unavoidable current arisen from social-economic behaviours, dysfunctions existing in the spatial system, and the uneven distribution of population in these societies. This phenomenon that Hamadan province has also been suffering from, requires planning in respect of the populability of each of the cities in the urban system structure of this province. In this regard, the researchinvestigated the population in every urban center by means of two modified rank-size model and linear-regression tests and tried to design the optimal sizes of settlements in the spatial system of Hamadan province, considering parameters like physical capability of settlements, the current of past population changes, the economic and employment creation capabilities of each urban center, and maintaining the balances of settlements spatial system and structure.

During the present study, it was understood that although the hierarchy system of Hamadan settlements (urban focuses) does not enjoy strike discontinuities to the extent that is seen at the national scale, it is not still balanced for service and facility distribution and requires a fundamental justification, specially in the middle of the hierarchy pyramid, and this was approved during the examination of different models.

On the other hand, analyses carried out in regard to the spatial system and the current of population migrations show that the development of settlements in the northern half of the province is suffering from dysfunctionalities and deficiencies. The process of population reduction in several rural regions has occurred specifically in the last decade, also, some of the urban centers in this region like Gol Tappeh and Shirin Su have recently changed-to city and currently have low populations.

An unbalance and the dominance of the bigger settlements of the province are seen in the urban focus hierarchical system. This unbalance is more considerable between northern and southern halves, so that the cities belonging to the mid levels 2 and 3 are all lying in the southern half of the province and in the northern half a group of low-level settlements can be seen. The main basis of the determination of priorities in the growth and development of urban centers of the province or in other words the condition of the relation of settlements to each other and to rural regions, is their role in attracting immigrants and their social-economic activities in the neighboring areas. As it was unraveled in the study, the southern regions of the province have a relatively balanced situation in the spatial distribution of settlements, the eastern and northern regions are suffering from deficiencies in respect of urban system and in the central areas the urban system is facing a centrality in

the distribution of urban population.
Hamadan City that has placed at level 1 as the capital city of the province lacks the necessary capabilities of a premier town to provide service for province's urban centers, because this town, in addition to weak economic structures, has also a limited domain of influence.
Among all different parameters, the role of political and economic factors along with population factors seems to be more significant in the construction of the urban system of Hamadan province. Several other social, historical, physical, factors also originate in political and economic structures.

CONCLUSION

Development of settlements in the northern area of the province can facilitate and speed up the urban development procedure and the comprehensive development of the province on the whole. Urban development in the northern area can not only provide a proper service coverage in the region, but also, by constructing the required facilities, be efficient in exploiting the capabilities existing in the population and the diversification and development of employment specifically in the nonagricultural parts of the area. In such terms, Kabudarahang town as the main city and the most populated urban point in the northern area of the province and because of its relative geographical centrality in this area, can be stabilized in this role in the future by proper developments and enhancements in urban fundamentals and service networks. Therefore, Kabudarahang town will be one of the urban development priorities of the province in the future. Although at present on account of the current communication networks and limited service capabilities this town has faced limitations even in service providing to its county domain, the necessities of urban development and the status of settlements spatial system in the northern area of the province necessitate the intentional development and the enhancement of its economic and service foundations. Other settlements of this area will have a dual priority in terms of balancing the urban population pyramid of the province as well as in terms of the spatial system of settlements. This group currently includes Famenin, Razan, Qorveh-e Darjazin, and Damagh as well as new towns of Gol Tappeh and Shirin Su. Finally, for providing optimal system of urban settlements, the research present some suggestion:
Location and leveling of new activities and settlement areas are recommended to be implemented in coincidence with the suggested urban system.
Taking account of the suggested urban system levels (2 and 3) in order to be, as regional and semi-regional balance centers, capable of competition with town Hamadan.
Improving the role of Hamadan City as the economic-political service focus of Hamadan province as well as its trans-regional role, so that it can play role as the premier town of the province and has the capability of competition with other premier towns of the district and the neighboring provinces to prevent the inter-province migrations.
Improvement of systematic viewpoints in planning for urban system as the dominance of unsystematic and categorical viewpoints has disturbed the economic foundation of the province. When the powerful economic foundation is accompanied by appropriate decisions and policies, the communication network between urban and rural regions and the commercial activities between them are defined more accurately with all activities, roles, duties, and levels clearly defined and arranged.
Implementation of similar researches and studies to gain a regulated model to explain and manifest the urban system and carrying out coincidental comparisons can be effective in obtaining one or more encounter strategies.
Adopting policies and planning in order to construct a developed system composed of small and mid cities that can manifest the space solidarity and integrity of the country in the framework of the urbanism national strategies.

ACKNOWLEDGEMENT

Support of department of Art and Architecture, Science and Research Branch, Islamic Azad university, Tehran, Iran is gratefully acknowledged. At the end, we intend to express our gratitude to research deputy Esmaeel Shiee, thesis advisor, associate professor of Faculty of Architecture and Urban Planning, University of Science and Technology who have cooperated with us in this investigation.

REFERENCES

Azimi. N., (2003), "**Physical design methodology of a network of regional habitat**", Center for Architecture and Urban Development Studies and Research, Tehran, Iran.
Behforooz. F., (1992), "**Theoretical Analysis - an Experimental System for Balancing The Spatial Distribution of Population in Cities**", Tehran Geographical Research Organization No. (28, Tehran, Iran).
Berry B.J.L., and Horton F.E., (1971), "**Geographic Perspectives on Urban Systems**", Englewood Cliffs, NJ: Prentics-Hall.
Bourne. L.S , Simons J.W., (1978), "**System of Cities**", New York, Oxford University.
Deicnmann .U., Henderson .V., (2000), "**Urban and Regional Dynamics in Poland**", Policy Research Working Paper No. 2475, The World Bank.
Dematties. G., (1997), "**Globalistion and regional integration: the case of the Italian urban system**". polytechnic and university of Turin, Italy 43: 331-338.
Etemad .G., (1984), "**Urbanization in Iran**",Agah Publisher, Tehran, Iran.
in Iran. Agah Tehran Publishe.
Hajipoor .K., (2003), "**Evaluation of Urban Improvement: Khuzestan Province**", M.S. thesis, Tehran University, Tehran, Iran.
Hajipoor .K., (2005), "**Review analysis, and presenting a model for the Khuzestan province"**,Journal of Fine Arts (Honarhaye ziba) No. 23, Tehran University, Tehran, Iran.
Hedayat .A., (2005), "**Analysis of Urban System in Southern Region**", M.S. thesis, Tehran University, Tehran, Iran.
Kalantari .K., (2001), "**Planning and Regional Development (theory and techniques)**", Khoshbin Publisher, Tehran, Iran.
Masumi Eshkevari .H,(2006),"**Principles of regional planning**", Payam Publisher, Tehran, Iran.
Mehdizade .J., (2007), "**Strategic planning, urban development**", Payame Sima Publisher, Tehran, Iran.
Nastaran. M., (2010), "**Analysis of the urban hierarchy of cities over one hundred thousand people**", Journal of Humanities and Cultural Studies, Tehran, Iran.
Norusis, M. J., (1988), "**Manual of SPSS**", Advanced Statistics, V. 2,USA.

Rosen KResnick . M ,(1980) , "**The Size Distribution of Cities: An Examination of the Pareto Law and Parimacy evidence from Asia and Americas"**, The Annals of Regional Science, 38: 149-171, USA.

Tahmasebi .S.H.,(2001) **, "Analytical features of the spatial organization of the Hamadan province with an emphasis on city**", Hamadan Management and Planning Organization, Hamedan, Iran.

Zebardast .E-, (2004) ,"**City size**", Center for Architectural and Urban Development Studies and Research, Tehran, Iran.