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The Role of Urban Networks in Sustainable Urban Development: A Case Study of Mazandaran

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ABSTRACT

Cities by that is formed of a hierarchy, affect the sustainable development of their land, in this research is analyzed urban network of Mazandaran according to factors such as topography and land divisions and its role in urban sustainable development of Mazandaran is checked according to factors of urban network in sustainable development. According to result of the research urban network of the Mazandaran province are largely affected on the urban sustainable development because geometrical characteristics and its function, economic, social and environmental conditions.

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INTRODUCTION

Indicators of that currently are used for measured development in the national and regional scales, as follows: index of urbanization that is ratio of urban population to rural population [1]. Distribution systems of cities have many effects in one area on various aspects of sustainable urban development such as social, economic and environmental [2]. But something currently has affected on this distribution of system indeed communications and transportation, that Human life, especially in urban areas with many problems has faced such as division of labor, mass production and severe fatigue [3]. Urban network, the spatial distribution of urban province is divided into two parts, east and west [3]. In the eastern part of Mazandaran - the largest and most populous cities are located- urban network as a sector, but in the west of province –that small cities as Tonekabon, Chalos and Noshahr are its largest cities -urban network is linear. Each of the sector and linear networks will change urban sustainable development in Mazandaran province by has affected on the economic, social and environmental dimensions of development. This change is differentiating in the part of eastern and western Mazandaran. The major questions in this study are as follows: how is the province of urban networks urban networks of Mazandaran Province what impact on the sustainable development of the province is? How urban network of Mazandaran province can is cause of sustainable urban development in the province? To clarify the research hypotheses are formulated as follows:

- It appears that the urban network in the East of the sector, and in other parts of the line
- Seems to focus on the political and economic systems, urban networks in East of Mazandaran province, due to be sector and closer to the network center (Sari) on sustainable urban development in this area than in other areas of Mazandaran has a positive impact.
- Urban Network province depending on the prevailing economic and political systems, different influences can affect the sustainable development of urban areas, If the "economic - political" focus, the same is the case at present, the geometric center of the urban network for urban sustainable development is to be distributed fairly in all areas, But if the political system or economic system is federal, the new network for West Province, the province's sustainable urban development is more balanced.

The importance and necessity of research:

Study of urban Networks causes to know, how people in a given geographical area to overcome the barriers to communication and exchange, and economy which used data exist, and because of the number the role of the networks cities in the complex relationships between them in the network How has established and ordered. For

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example, if a city has an administrative role, how and in what way does the network command, and how it affects on it, and the economic role of, how it is produced, and what is covered the trade organization an area? In other words, how has been manifested, the highest form of social life, and human civilization looking of the context of the urban network of area.

One of the differences and gaps in the existing research that there are similarities between the concept of urban networks and urban hierarchies, which is handled differences French geographer Pire Georges. Geographer to the urban hierarchy is not necessarily an urban network, but its simple form can be found in the urban hierarchy, the head of which is the capital city or metropolitan area and plays roles in commerce and the delivery of services rare and scarce, and the decisions of administrative, financial and leadership institutes at different levels of benefit, and the role of transmission of the service, perhaps due to the smallest cities and towns between 5 to 10 thousand people, and even to the heart of the countryside continues [4].

MATERIALS AND METHODS

The purpose of this research is the application of research to achieve its goals more descriptive - analytical uses. Figure 1 shows the conceptual model and analytical parameters, variables, research questions and hypotheses are defined by's.

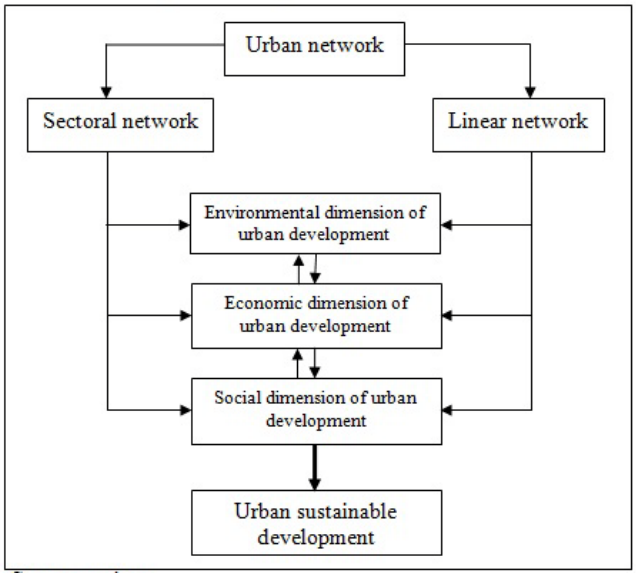

Fig. 1: conceptual model of research.

Variable:

In the description of an urban network and in the definition of urban regions, the different functions of a city must be taken into account. Simultaneously, a city functions at the:

- Local level: neighborhood for citizens and daily social practices and quality of life indicators
- Regional level: centre for its functional urban region
- National level: node in the national urban system
- Global level: location for international activities and a node of international urban systems

In this study, attention was paid to the second function of the city, whereas the quality of life indicators, related to the first function of a city, were intentionally excluded in order to identify the functional urban regions' features in the national urban system.

Research Experience:

Shahoseini and Taghi Rahnamaii [3] is studied the sustainable development and urban network in relation to each other in the coastal provinces of Mazandaran and Hormozgan. In the research of the city and urbanization system is affected in the province of natural conditions and government policies and private sector participation. Distribution of the population of the Mazandaran province is almost balanced and functions of the province than Hormozgan province is more varied and Mazandaran province than Hormozgan province of the socio - economically level have better, so provides better living conditions for their residents. But the important point is that the results referred to in this article, the lack of consistency between the type and volume of activities with the natural environment in the province. If the type of activities in a way that is more dependent

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citizens on public services, so dynamic and endogenous development has not seen in the city and in term of sustainable urban development in the province is justified.

Taghvai and Goudarzi in an article entitled "Analysis of urban network status in Bushehr province", urban network of the province is studied. Among the major findings of this research is to balance the distribution of population in urban areas, but population distribution in urban networks of the province is not balanced. The spatial distribution of cities number and urban population in the province is evaluated of the semi-balanced according to the entropy of the coefficients obtained. As a result urban network of the province was evaluated in the situation semi balanced; the main reason for this is that there are several cities, including cities Borazjan, Genaveh, Khormoj, Kangan and Deylam to the economic is opportunity.

"Zachary Pinull" in the article being entitled "The locations Central to Network: a shift in the hierarchy of urban America between 1900 and 2000," the study concluded that during the twentieth century hierarchy Urban United States has become from the central location based on the size of the urban network. This study shows that such urban hierarchy is fluided and at the beginning of the twentieth century urban economies were primarily organized by urban hierarchies based on the size.

What is a network of cities? It is a structure where the nodes are the cities ,connected by links of different nature, through which flows of socioeconomic nature are exchanged. These flows are supported on communication and telecommunication infrastructures. The main characteristics of the networks of cities are the possibility of hierarchical and non-hierarchical structures, cooperation (or competence – cooperation) among the cities, and the generation of advantages related to the organization of the urban structure. This is a systemic and global definition of a network of cities, and is not utilized for all the researchers. In fact, each researcher uses a particular r definition (Table 1).

Table 1: Different interpretations of the network concept.

Author	Concept	Principal elements
Theory of Systems -Westlund (1999)	System of objects added to a group of connexions.	-Nodes and links. Associative propriety.
-Dematteis (1990 and 1991)	System of centers (or areal urban systems) related by links.	- Nodes and links.
- Pred (1979)	In an urban system not only vertical relationships (hierarchical) are important, but also the horizontal and cooperative links.	-Nodes and links. Vertical and horizontal relationships.
-Camagni and Salone (1993)	System of horizontal, non-hierarchical relationships among specialized centers providing externalities from Complementarily/vertical integration or from synergy/cooperation among centers.	-Nodes and links. -Horizontal relationships. -Synergy and complementarily - Externalities
- Batten (1995)	Two or more previously independent cities ,potentially complementary in function, strive to cooperate and achieve significant scope economies aided by fast and reliable corridors of transport and communications infrastructure.	-Cooperation. -Transport and communications infrastructure. - Scope economies
- Boix (2002)	Structure where the nodes are the cities, connected by links of different nature, through which flows of socioeconomic nature are exchanged. These flows are supported on communication and telecommunication infrastructures. Principal characteristics of the networks of cities are: the possibility of simultaneous hierarchical and non-hierarchical Structures, cooperation (or competence– cooperation) between the cities, and the generation of advantages related to the organization of the urban structure.	-Nodes and links. -Transport and Communications infrastructure. -Coexistence of hierarchical and non-hierarchical structures. -Generation of advantages)network externalities) related to the urban structure and the interaction between the nodes
-Vartianen (1997)	Inter-urban cooperation (transnational) of cities and other actors based on the city, with the purpose of use and develops synergetic effects.	-Urban networking as economic and organizational principle -Duality between cities and actors -Network can be a functional network (spontaneous) or a lobby -Networks are stable. -Polycentrism.
- Taylor (2001)	A kind of organization where the actors are nodes and the social relationships the links .These social relations are economic links that acts to geographically structure the world economy.	-Nodes and links. -Economics and sociology -Supra-nodal and sub-nodal. -World system.
-Camhis and F(1992) -European Commission (1999)	Formal agreement between relevant partners.	-Constitution in organizations. -Defense of interests and promotion of specific networks.

Typologies of networks of cities:

The flexible interpretation of the network concept allows its identification based on different characteristics. This generates a set of typologies. The more utilized are the division in vertical, horizontal and polycentric

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networks [6] and the division in synergy and complementarily networks [7]. Recently, Trullén and Boix [8] have incorporated a third classification based on the generation and transmission of knowledge .

Vertical, horizontal and polycentric (multicentric) networks

a. Vertical (hierarchical) networks:

They are the classical networks theorized in the central place models [9, 10]. The links between the nodes of the network are asymmetric, and the system is "areal": it implies spatial contiguity and predetermination of the spatial relationships between nodes. This kind of networks describes a territorial system in equilibrium, where all relation s are based on the concepts of "upper and lower range" (The "upper range" is the farthest distance the dispersed population is willing to go in order to buy a good offered at a central place. The "lower range" (sometimes called "threshold") is the minimum amount of consumption needed to offer the good.) each rank of cities offers diverse goods given their dimension.

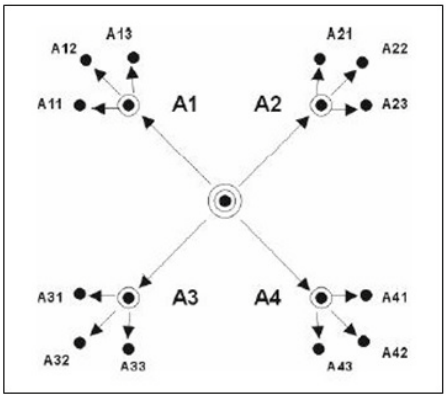

Fig. 2: Vertical (hierarchical) networks.

b. Horizontal (non-hierarchical) networks:

The links between the nodes of the network are symmetrical or quasi -symmetrical, and the concepts of "upper and lower range" do not operate. There is not an ordination of the goods based on the rank of the cities.

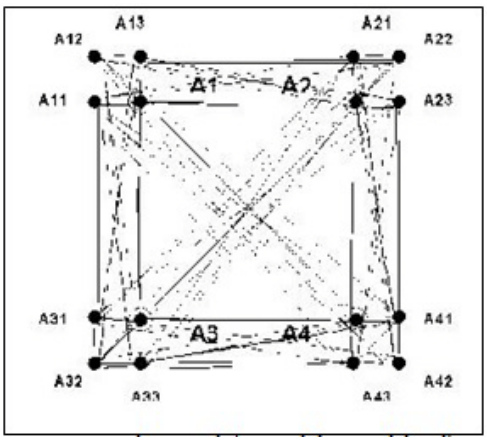

Fig. 3: Horizontal (non-hierarchical) networks.

c. Polycentric (multicentric) networks:

Combine vertical and horizontal links. Urban functions are combined in different ways. Major centers t end to generate agglomeration economies and contain high order functions ,but "upper and lower range" does not apply in a strict sense, because centers can be specialized regarding the networks.

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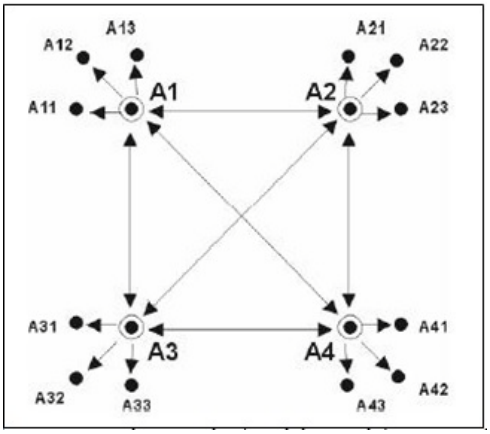

Fig. 4: Polycentric (multicentric) networks.

Synergy and Complementarity networks:

a. Synergy networks: arise between centers with a very similar orientation that interacts in a non - programmed way or collaborate in a planned way. Camagni and Salone [7] find this behavior in: high order centers like World Cities or Euro cities along the "Blue Banana"; and in low order centers interested in capturing network effects from the interurban cooperation (Nord-Pas-de-Calais or Wallonia). Other kind of synergy networks are the "innovation networks", where cities collaborates in order to reach a sufficient critical mass. One may suggest the division of the synergy concept in specialization networks, synergy networks and innovation networks. This is an operative distinction in order to differentiate the productive orientation (industry based) from other types of synergy .

b. Complementarity networks: they are links between specialized centres that contain complementary activities or functions. From a more traditional perspective, this mechanism assures that each city has enough market-share. From a more recent point of view, this is a reflex of the labour division in the network, where some cities can have a strong specialization oriented to the international markets, and other acts as service centres. In fact, the ways of complementarity can be diverse.

Although concepts of vertical and horizontal seem more exclusive, one could find that two cities can have simultaneous specialization (synergy) and complementarity links. This is possible because cities are not mono specialized or mono- function, but poly-specialized.

Knowledge-based networks of cities:

Relations between cities can be specified through information and knowledge flows. This approach allows one to analyze processes of generation and diffusion of knowledge through the urban structure. Central place models relate the production of innovation to the rank of the city in the urban system [11]. The amount of cumulate knowledge is ordered in a hierarchic way because depends of the population of each city. Then, innovations and knowledge spread in a hierarchical way from major cities to minor cities. On the other hand, in the network models knowledge diffusion cannot only be carried out in a vertical way, but also among cities of the same rank and from cities of lower rank to cities of higher rank. Tullén and Boix [4] use the industry classification of the OECD to distinguish between high knowledge urban networks and low knowledge urban networks. Classification is not exclusive, and a city can be in a high and a low knowledge network at the same time.

Other typologies of networks of cities:

Other typologies of network of cities can derive from the ambit of interaction (local networks; regional and national networks and world city networks), from the principle of formation and exchange (natural networks and cooperation networks) and from the duration of the network (conjuncture networks and stable networks).

RESULTS AND DISCUSSION

Case study:

Province with an area of 23.756 square kilometers, which is 1.46% of the total area of the country and a population of over 2602008 people (4.33% of the total population), from the north to the Caspian Sea, east to the Golestan province, south of Tehran and Semnan provinces, and west to the Gilan province is limited. Figure 5 positioning Mazandaran province show in the north of Iran and southern coast of Caspian Sea.

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Table 2: Typologies of networks of cities.

Principle		Typology
Articulation of the urban structure (Dematteis 1990 and 1991)		Vertical (hierarchical) networks Horizontal (non-hierarchical) networks Polycentric networks
Nature of the network externality (Camagni and Salone 1993)		Complementarity networks Synergy networks Innovation networks
Knowledge generation and transmission (Trullén and Boix 2001)		High knowledge urban networks Low knowledge urban networks
Other typologies	Ambit of the network	Local networks Regional networks World city networks
	Principle of formation and exchange	Explicit cooperation networks Natural networks
	Duration	Stable networks Conjuncture networks

Fig. 5: Iran s Position in the Middle East and Mazandaran Province in Iran.

Urban Networks of the Mazandaran Province:

Cities of the Mazandaran province has grown of 32 city in 1365, to 36 in 1375 and 51 in 1385 [1]. In addition, the number of cities, urban population of the province has also been added. Urban Population of the province is reached of 893,023 people in 1365 to 1,265,554 in 1375 and 1,554,143 in 1385. The increasing influence of environmental conditions and socio-economic indicators that is of the socio-economic infrastructure , such as road construction, power transmission lines, distribution of the industrial workshops and mines, agricultural activity and other factors.

Urban Hierarchy of Mazandaran Province:

Urban Hierarchy by "rank - size" Rule and "adjusted rank -size" Rule of Behforoz:

Mazandaran province in 1385 the city's 51 that most populous Sari city with 259084 inhabitants and their smallest population is Farim with 180 people (Table 3). By adjusted rank -size" rule all cities in Mazandaran to the rank sixteenth has added to population, and of the rank sixteenth to rank fifty-first most populated cities are faced with a shortage of population. But to the replace of added population for cities that deficient urban population, 163848 additional people will remain for province. In Figure 6 the rate and direction of change in population size cities of the Mazandaran province is evident by "rank- size" rules and "adjusted rank -size" rule. One significant aspect of this figure is visible , that the actual population size much closer to adjusted rank -size" rule to "rank- size" rules.

System of hierarchy of the urban network of Mazandaran province is four-level model., In this model, Sari, Babol, Amol and Ghaemshahr With is locating in table tops and other cities are next in the hierarchy. (Table 4)

Sari as center of Mazandaran Province more people are attracted and the polarization orientation is today. Cities of Babol, Amol and Ghaemshahr in the besides of it having a population of over 100 thousand due to business services, education, especially higher education, health care including technical hospitals, transport, storage and communication industry, the city is a national center and is operating infra provincial. The city's four with locating in beside of major rivers of the region also have a lot of influence. However, in the urban hierarchy large cities of the province in terms of population is not as a metropolitan or national metropolitan and regional metropolitan or big city. In Mazandaran province Sari, Mazandaran, Amol, Babol in the first level are

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located among medium-sized cities, But the first level of service is provided. After the first cities two Behshahr and Behshahr cities as centers of its county is located with the highest population. The cities with having centers of education, particularly with higher education institutions, industry, buildings, public and social services, Intermediate financial, transport and services with overcoming on the storage and business activities, are operating in the area [1].

Table 3: Cities hierarchies of Mazandaran province by adjusted rank -size" rule to "rank- size" rules based on 2006 Census.

rank	cities	Actual population	Population by"rank-size" rules	Differentiate of actual population to "rank- size" rules	Population by adjusted rank - size" rule	Differentiate of adjusted rank -size" rule	ranking Ratios of cities
1	Sari	259084	259084	0	323262	-64178	1
2	Babol	198363	129542	+69094	161631	+37005	0.5
3	Amol	197470	86361	+111109	107754	+89716	0.333333
4	Ghaemshahr	174246	64771	+109475	80815	+93431	0.25
5	Behshahr	83537	51816	+31721	64652	+18885	0.199996
6	Babolsar	47872	43180	+4692	53877	-6005	0.166664
7	Neka	46152	37012	+9140	46180	-28	0.142857
8	Chalos	44618	32385	+12233	40408	+4210	0.124998
9	Tonekabon	43128	28787	+14341	35918	+7210	0.111110
10	Noshahr	40578	25908	+14670	32362	++8216	0.099998
11	Fereydonkenar	34452	23553	+10899	29387	+5065	0.090908
12	Ramsar	31659	21590	+10069	26938	+4721	0.083332
13	Mahmodabad	27561	19929	+7632	24866	+2695	0.076920
14	Joybar	24117	18506	+5611	23090	+1027	0.071428
15	Amirkala	25186	17272	+7914	21551	+3635	0.066665
16	Nour	21806	16192	+5614	20204	+1602	0.062497
17	Galogah	18720	15240	+3480	19015	-295	0.058822
18	Zirab	18216	14393	+3823	17959	+257	0.055553
19	Katalom and sadat mahale	17900	13636	+4264	17014	+886	0.52631
20	Klardasht	11921	12954	-1033	16163	-4242	0.049999
21	Rostamkola	11306	12337	-1031	15393	-4087	0.047617
22	Abasabad	11256	11776	-520	14694	-3438	0.0454545
23	Khalilshahr	10096	11264	-1168	14055	-3959	0.0434782
24	Khoramabad	9936	10795	-859	13469	-3533	0.0416666
25	Salmanshahr	9592	10363	-771	12930	-3338	0.04
26	Chamestan	9481	9965	-484	12433	-2952	0.038461
27	Sorak	8817	9596	-779	11973	-3156	0.037037
28	Shirgah	8529	9253	-724	11545	-3016	0.035714
29	Polsefid	8473	8934	-461	11147	-2674	0.034485
30	Kiakola	7364	8636	-1272	10775	-3411	0.0333333
31	Gotab	6956	8358	-1402	10428	-3472	0.032258
32	Izadshahr	6882	8096	-1214	10102	-3220	0.03125
33	Bahnemir	6836	7851	-1015	9796	-2960	0.0303030
34	Sorkhrod	6569	7620	-1051	9508	-2939	0.029411
35	Royan	6339	7402	-1063	9236	-2897	0.028571
36	Nashtarod	5837	7197	-1360	8979	-3142	0.0277777
37	Klarabad	5457	7002	-1545	8737	-3280	0.027027
38	Marzanabad	5078	6818	-1740	8507	-3429	0.026315
39	Kiasar	3590	6643	-3053	8289	-4699	0.025641
40	Kalebast	3543	6477	-2934	8082	-4539	0.025
41	Khoshrodpey	2940	6319	-3379	7884	-4944	0.24390
42	Galogah	2512	6169	-3657	7697	-5185	0.023809
43	Kohikheil	1939	6025	-4086	7518	-5579	0.023255
44	Baladeh	1134	5888	-4754	7347	-6213	0.0227272
45	Dabodasht	1096	5757	-4661	7184	-6088	0.0222222
46	Alasht	976	5632	-4656	7027	-6051	0.0217391
47	Rine	860	5512	-4652	6878	-6018	0.0212765
48	Marzikala	525	5398	-4873	6735	-6210	0.0208333
49	Zargarmahale	425	5287	-4862	6597	-6172	0.0204081
50	Gazanak	323	5182	-4859	6465	-6142	0.02
51	Farim	180	5080	-4900	6338	-6158	0.019607
total		1531706	1307743	+223963	+223963	+163848	4.7382855

The third level or urban center, Mazandaran province has 9 urban centers that including center small counties and province populated areas. The fourth level or "village – cities" contains the greatest number of cities in the province. This level in terms of population can be divided into smaller classes. In the Mazandaran

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province of 36 cities in the level are located six cities less than one thousand people and 22 cities have a population of less than 10 thousand people. the cities Despite the lack of urban functions, reasons such as increasing population, tourism attractions and environmental capacities such as Nashtaroud and Rine of larijan or merged villages together as became a city Zargarmahale and Galogah. Why these cities have not a significant impact on the economy and form of the villages its surrounding and are depending to its largest city [1]. For example, Neka city is formed in the relation to agricultural and industrial sites it's around and yet many urban residents for agriculture or use of summer back to their villages. Because it is not an independent city and the city's economy is dependent to Bbolsar city. Although the pattern of urban hierarchy system in Mazandaran province is no logical form, and there is host of "village - city" is also clear evidence of this claim, the population distribution is almost perfect, and the distance is much less populated cities [1].

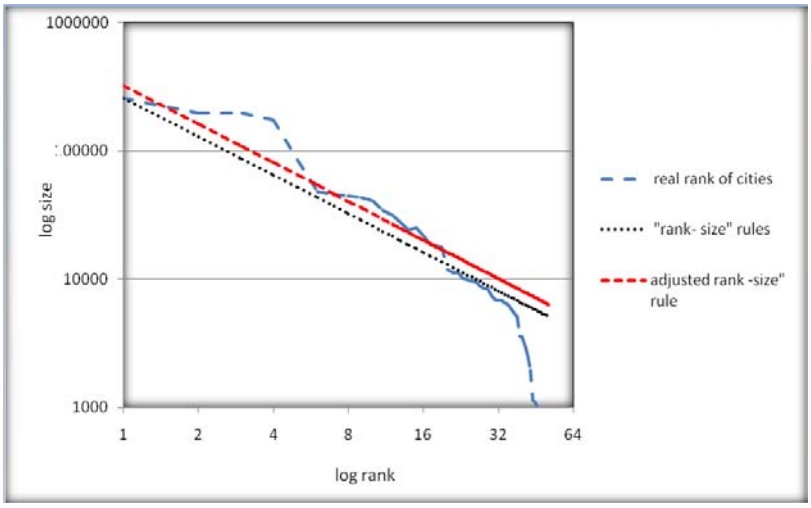

Fig. 6: Comparison of log of cities hierarchy of Mazandaran province based on adjusted rank -size" rule , "rank-size" rules and real rank cities in 2006 Census.

Table 4: Model hierarchy urban network of the Mazandaran province based on population classes of the year 2006.

Rank or size	level	Population classes	Number of urban point
1	National metropolis	Top of 1500000	--
	Large city	1500000-500000	--
2	Medium city(regional metropolis)	500000-100000	4
3	Area center	500000-100000	2
4	Small city(urban center)	100000-50000	9
5	Village-city	Less of 25000	36
total			51

Source: Shahhoseini & Rahnamaii [1]

Factors Affecting the Province's Urban Network

The Role of Topography in Urban Networks:

The forms of roughness in Mazandaran province is composed of the three part of plain, and mountain and Submountaine [5]. This forms of the roughness impact of the urban network, followed by the development of urban tourism and sustainable development of the province. Figure 7 shows Distribution of cities of Mazandaran province by province topography. As is evident in these images, topography of Mazandaran province in the distribution of cities has a large impact and at the reason is directly impacted on the urban networks of province.

The Role of Political Divisions in the Urban Network:

As in Figure 8, by overlapping maps of political subdivisions and map distribution of cities in Mazandaran province is shown, the political divisions in the distribution of cities the province is very large played, a way that each of counties tried to have at least two or three cities in their limits. One of the main reasons for the high impact of political divisions in the province is way distribution of resources and flows. According to the sources and flows of money, goods and capital in Iran will be injected into regions thorough the system and political institutions, and the political systems and institutions usually are municipalities, counties and state agencies, people in the region of try its area as the political division would introduce to political center (the capital) to the direct take advantage of the injecting resources and processes**.** One of the main reasons that each of the counties in Figure 8, there are at least two or three of cities the most important ways of getting resources and flows (resources, money, investments, etc.) is to have agencies such as municipalities.

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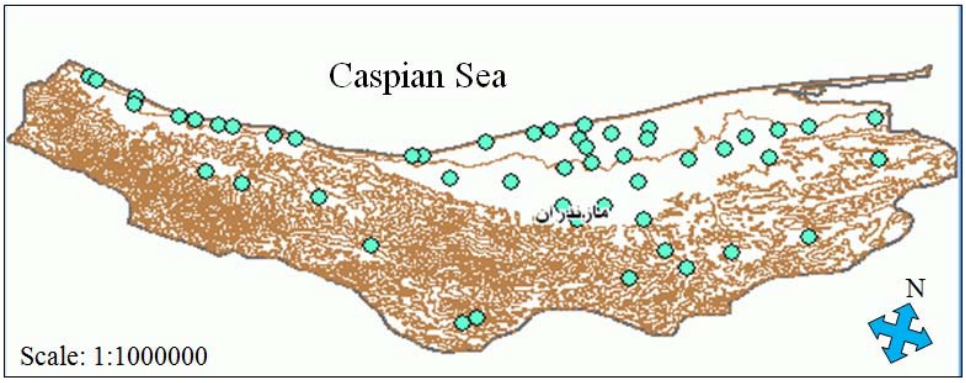

Fig. 7: Distribution of cities of Mazandaran Province Based on Topography.

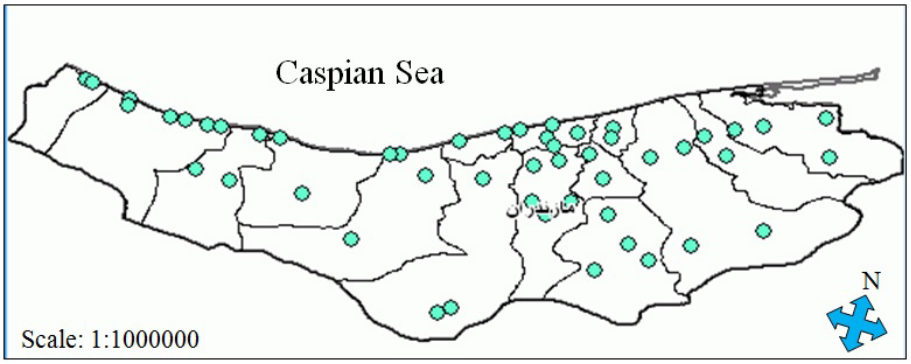

Fig. 8: Distribution of cities of Mazandaran Province Based on Political Division.

The Role of Urban Network in the Urban Sustainable Development of Mazandaran:

Urban network system in the East province, as shown in Figure 8 are mostly "sector as well as in other parts of the linear. Urban network system in the province follows roads network, how it is related to the natural and human factors. In the province in 2006 the land routes along of the roads is 2301.5 km. Communication Network of Mazandaran province of the routs "Tehran – Chalus" "Tehran – Amol" and "Tehran – Qaemshhr" and road that runs through the central part that is road is passed of Amol toward Babol, Ghaemshahr, Sari, Neka. Important axis of communication the network is road Transit "Rast – Mashhad" that is located in the Mazandaran plains of alluvial fans, that is the bar area of the Ramsar in the West begins and the easternmost that is Golestan forest that stretch at the Golestan province. It is 590 km long, in the east - west drawn as a backbone, that in the direct traffic in the province plays a very important role. The road link Mazandaran province with the provinces of Gilan, Golestan and North Khorasan provides and to the connecting with mean roads other that are mostly perpendicular, Mazandaran are connected with the other parts of the country as Semnan and Tehran. In contrast, all of the southern area of the province is considered as sparsely populated areas and under development the province therefore geomorphological structure, cold frost weather conditions, lack of resources forestry and tourism, lack of water resources and soil types, despite having some important economic resources such type's mines. Predominance of small and scattered rural settlements and traditional production practices is of the prominent characteristics of these areas. However, within the network some roads interprovincial as Chalos, Haraz, Firozkoh and Khoshyelhgh are affected in moderated the gap between a plain and mountain areas.

The whole all cities in Mazandaran province are located along the land routes such as freeways, main roads, secondary roads and rural roads, the roads that are important in the spatial distribution of cities and the coherence and balance of urban and rural areas within each region. Its main ways is mostly conform on the plain land or big valley mountain. As of today there is roads connecting and equipped of in the urban network could not of the villages of the province named as no longer an urban network of and to the islands of isolated of the urban region. Air and railway lines, which are considered as other elements of urban regions development,has more contributed to the development of cities sari and Ghaemshahr. Railway line Tehran – north in the entrance to Ghaemshahr with the East extends and only international airport in the province is located in the Sari. The road factor as main variable in the urban network is affected of power, infrastructures and capacities of the natural and human environment. In the other word in any area where is possible of economic activities such as agricultural, industrial and services with the natural conditions, funds is poured into it and to provide quick and

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easy access to the area, sector and linear urban network of the Mazandaran province the result is the same. These forms of urban development both is originated more sustainable in the urban network system of the Mazandaran province and lack of right management led to unsustainable in the following:
- In some cities they are located on or near dangerous faults.
- Fluctuations in sea water to have completed, parts of the city under water or are exposed.
- Cities that were in beside of rivers are risky to consider at the Outbreak and flood characteristics of these rivers.
- Enter Sewage into surface water has caused pollution them.
- Rapid changes in land use areas around the city.
- One of the important functions of the province is tourism, But existing roads of the province is not response within urban and suburban traffic congestion of the domestic and foreign tourists, indeed is withstanding and vulnerable a lot of traffic.
- Shaping the urban landscape without the identity has arisen as a result of emergency urbanization, so it is impossible to define the architecture for identity for Mazandaran cities.
- Existing congestion in the urban Network system and nearby cities damage to the environment.
- This form of development is filling spaces interurban and is caused corridor development along the road and along the main roads in urban areas to be stuck together.

Natural attractions such as caves, wetlands, mineral springs, beautiful waterfalls, forests, mountains and sea, is everlasting bond to this historic area and Alborz mountain range on one side and Caspian sea on the other hand are generated beautiful natural landscapes. Mazandaran only province that is connected with axis three Haraz ,Kandovan and Savadkoh and three Airport of the Sari, Ramsar and Noushahr connect to other point , and railways of it passes. In addition, the coastal road of the Ramsar to Babolsar 220 km long and goes from 10 to 300 meters from the beach. The province has more than 840 attractions, historical, natural, recreational, pilgrimage, sports and scientific research, is one of the provinces that has attracted a lot of tourists annually. One of the main attractions of the province could pointed to or Mount Damavand or Roof Iran as an international appeal, with an altitude of 5671 meters, with the largest lake in the world (the Caspian Sea), 27 Forest Park, 9 Wildlife Preserve, 12 Falls of, 10 lakes and hundreds of rivers and hot and cold mineral springs, 4 pools, 18 summer with excellent weather, approximately 381 of the National historic registry, and 31 old and traditional market. Forests in Mazandaran have more than one million hectares of area that as a green belt is covered northern slopes of the Alborz Mountains and the shores of the Caspian Sea. The green belt of the mountain wonderful close to the sea in the some points and in some areas further inland, where some parts of the overall away and the ground is provided for the expansion of the green and smoothly fertile plains.

Conclusion:

Among the important results of the research network of the city and its province urban sustainable development network include:

- The numbers of cities in the province have increased that the increasing influence of environmental conditions and socio-economic indicators that is of the socio-economic infrastructure, such as road construction, power transmission lines, distribution of the industrial workshops and mines, agricultural activity and other factors. The outcome of this process is the formation of a network, particularly in urban areas. The urban network in the East sector and in other parts of the province is linear.
- Urban network system in Mazandaran depends on how well the natural and human factors.
- All cities in the Mazandaran province are located along the land routes such as freeways, main roads, secondary roads and rural roads, the roads in the cities of the spatial distribution and coherence and balance of urban and rural areas within a region plays an important role.
- Air and railway lines that are as elements of urban regions development, more has contributed to the development of cities Sari and Ghaemshahr.
- Urban network hierarchy of the Mazandaran province is The four-level model , In this model cities of Sari, Babol, Amol and Ghaemshahr having the highest score at the top of ranking and other cities are located in the the hierarchy next.
- "Sari" as the center of the Mazandaran province is attracted more people and today has a tendency to polarization.
- Cities of Babylon, Amol, Ghaemshahr due to numerous facilities has function of the first level national service center.
- There are not in the urban hierarchy system of the Mazandaran province Metropolitan or national metropolis and big city or regional metropolis.
- In the Mazandaran province are located cities of Sari, Amol, Babol and Ghaemshahr in the fist level as medium-sized cities or metropolitan areas that are located in the among medium-sized cities in megacity model. After the first cities, two Behshahr and Babolsar cities are located as its county center with the highest population. These cities with having education centers and other facilities are operating in the area level.

- Mazandaran province at the third level or urban center is 9 urban centers that including centers of Small County and province populated areas.
- Four levels or "village - city" is composed of 36 cities in the province of less than one thousand six cities and 22 towns are less than 10 thousand people. Despite the lack of urban function, various reasons were converted into cities. Why these cities are is depending at the largest cities.
- The pattern of urban hierarchy system in the province is no logical for and host of "village - city" is also clear evidence of this claim, but the population of the province is almost perfect distribution, and population within cities is very low.
- The combination of urban settlements in the province is the "village - city", small town and middle of town.
- Settlements with a population of less than 1,000 people are known as town, including their reasons are: the implementation of development projects, current government spending in cities, per capita income and per capita investment in the cities, changes in agricultural prices, development of tourism activities and the development of bureaucracy.
- Increasing urbanization in the province because it looks role of the public sector and the private sector in social and economic activities of the province is.
- Urban Functions in the province can be categorized at the functions of in agriculture, tourism, port, industry and services.
- Port activity in Mazandaran province is mainly very impressive and is summarized in fishing activities.
- Industries in the province are influenced by natural and environmental conditions. Within the province more small industries in the fields of food, clothing, wood and non-metallic minerals.
- The radius functions of the city in Mazandaran province has a tendency to get out. Within the province of the city tend to Tehran. So that in some cases superior needs of the cities of Tehran comes directly. Situation, especially in the cities of western and central province is considering through axes of communication Kandovan, Firoozkooh and Haraz, after Tehran to cities of the Semnan, Rasht, Lahijan.

According to result of top urban network of the Mazandaran province are largely affected on the urban sustainable development because geometrical characteristics and its function, economic, social and environmental conditions.

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